



**UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION I**

2100 RENAISSANCE BOULEVARD, SUITE 100
KING OF PRUSSIA, PENNSYLVANIA 19406-2713

May 13, 2013

Mr. Michael J. Pacilio
Senior Vice President, Exelon Generation Company, LLC
President and Chief Nuclear Officer, Exelon Nuclear
4300 Winfield Road
Warrenville, IL 60555

SUBJECT: LIMERICK GENERATING STATION – NRC INTEGRATED INSPECTION
REPORT 05000352/2013002 AND 05000353/2013002 and NRC OFFICE OF
INVESTIGATIONS REPORT 1-2012-024

Dear Mr. Pacilio:

On March 31, 2013, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at your Limerick Generating Station, Units 1 and 2. The enclosed inspection report documents the inspection results, which were discussed on April 5, 2013 with Mr. T. Dougherty, Site Vice President, and other members of your staff.

The inspection 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.

This report documents one NRC-identified finding of very low safety significance (Green). Additionally, a licensee-identified violation, which was determined to be of very low safety significance, is listed in this report. However, because of the very low safety significance, and because the issue has been entered into your corrective action program, the NRC is treating the licensee-identified violation as an NCV, consistent with Section 2.3.2 of the NRC Enforcement Policy. If you contest the NCV 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 addition, if you disagree with the cross-cutting aspect assigned to the finding 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 Limerick Generating Station.

The inspection also reviewed actions regarding the identification of the failure to follow a Radiation Work Permit by an Instrumentation and Controls (I&C) technician on February 7, 2012. In response, the Region I Field Office, NRC Office of Investigations (OI), initiated an investigation on March 7, 2012, to determine whether the I&C technician deliberately entered a room posted as requiring neutron-monitoring dosimetry without obtaining the proper neutron dosimetry or having received a briefing from the Health Physics department prior to entry as required by the Radiation Work Permit. Based upon the evidence developed during the investigation, although the technician entered a room marked "For entry: Neutron monitoring" without having received a briefing from Health Physics or the proper neutron dosimetry, OI found insufficient evidence to conclude that the technician's actions were deliberate.

The failure to follow the Radiation Work Permit was determined to be a violation of regulatory requirements and was promptly entered into the corrective action program for evaluation and correction. The safety significance of the violation was evaluated by the NRC. The violation was found to be minor because: traditional enforcement did not apply; the violation did not have the potential to lead to a more significant safety concern; the violation did not relate to a performance indicator threshold; and, based on circumstances and radiological conditions present, the violation did not affect the applicable cornerstone objective.

Please note that final NRC documents, such as the Office of Investigations report described above, may be made available to the public under the Freedom of Information Act (FOIA) subject to redaction of information appropriate under FOIA. Requests under FOIA should be made in accordance with 10CFR 9.23, Request for Records.

In accordance with 10 *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 Public Document Room or from the Publicly Available Records component of the NRC's document system 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/

Mel Gray, Chief
Reactor Projects Branch 4
Division of Reactor Projects

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

Enclosure: Inspection Report 05000352/2013002 and 05000353/2013002
w/Attachment: Supplemental Information

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U.S. NUCLEAR REGULATORY COMMISSION

REGION I

Docket Nos.: 50-352, 50-353

License Nos.: NPF-39, NPF-85

Report No.: 05000352/2013002 and 05000353/2013002

Licensee: Exelon Generation Company, LLC

Facility: Limerick Generating Station, Units 1 & 2

Location: Sanatoga, PA 19464

Dates: January 1, 2013 through March 31, 2013

Inspectors: E. DiPaolo, Senior Resident Inspector
J. Hawkins, Resident Inspector
A. Rosebrook, Senior Project Engineer
R. Nimitz, Senior Health Physicist
E. Burket, Reactor Inspector

Approved By: Mel Gray, Chief
Reactor Projects Branch 4
Division of Reactor Projects

Enclosure

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SUMMARY OF FINDINGS

Inspection Report 05000352/2013002; 05000353/2013002; 01/01/2013-03/31/2013; Limerick Generating Station, Units 1 and 2; Operability Determinations and Functionality Assessments.

This report covered a three-month period of inspection by resident inspectors and announced inspections performed by regional inspectors. Inspectors identified one finding of very low safety significance (Green). The significance of most findings is indicated by their color (Green, White, Yellow, Red) using Inspection Manual Chapter (IMC) 0609, "Significance Determination Process". The cross-cutting aspects for the findings were determined using IMC 0310, "Components Within Cross-Cutting Areas." Findings for which the "Significance Determination Process" does not apply may be Green, or be assigned a severity level after Nuclear Regulatory Commission (NRC) management review. The NRC's program for overseeing the safe operation of commercial nuclear power reactors is described in NRC technical report designation (NUREG)-1649, "Reactor Oversight Process," Revision 4, dated December 2006.

Cornerstone: Mitigating Systems

- Green. The inspectors identified a Finding (FIN) of very low safety significance (Green) for the failure to adequately assess the operability of multiple safeguard battery chargers in a timely manner after an issue report (IR) was generated for battery charger testing concerns. Specifically, although the IR documented as-found current limit settings for safeguard battery chargers that were below Technical Specification (TS) minimum values, the operability basis documented that no operability concern existed because the battery chargers had passed their most recent TS surveillance tests and no explanation for the unexpected test results was given. Following questions from the inspectors regarding the operability bases of the battery chargers, Exelon staff performed an in-depth operability determination which factored in battery charger maintenance history, preventive maintenance practices, past operating experience, and vendor input. Exelon personnel entered this issue into their corrective action plan (CAP) as IR1486275 and plan to perform an evaluation to address the shortcomings in the initial operability determination.

The performance deficiency was more than minor because it was associated with the Human Performance attribute of the Mitigation Systems cornerstone and affected the cornerstone objective of ensuring the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences (i.e., core damage). This finding was also similar to examples 3.j and 3.k of IMC 0612, Appendix E. Specifically, in the absence of any further engineering evaluation, there was reasonable doubt of operability of multiple safeguard battery chargers at power operations. This finding was evaluated in accordance with NRC IMC 0609, Attachment 4, "Phase 1 – Initial Screening and Characterization of Findings," and determined to be of very low safety significance (Green) because the finding does not affect the operability of the system, does not represent a loss of system and/or function, and does not represent an actual loss of function of at least a single train for greater than its technical specification allowed outage time.

The inspectors determined the finding has a crosscutting aspect in Human Performance, Decision-Making, because Exelon personnel did not make a safety-significant decision using a systematic process, especially when faced with uncertain or unexpected plant conditions, to ensure that safety was maintained. Specifically, Exelon personnel did not adequately assess the operability of multiple safeguard battery chargers in a timely manner after an IR was generated for battery charger testing concerns that called into question the

operability of safeguard battery chargers [H.1(a)]. Enforcement action does not apply because the performance deficiency did not involve a violation of a regulatory requirement. (Section 1R15)

Other Findings

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

REPORT DETAILS

Summary of Plant Status

Unit 1 began the inspection period at 100 percent power. On January 11, 2013, operators reduced power to approximately 63 percent to facilitate control rod scram time testing, a control rod pattern adjustment and to perform maintenance on the 'A2' moisture separator. Operators returned power to 100 percent on January 12. Power was reduced to approximately 95 percent on January 19 to facilitate a follow-up control rod pattern adjustment. Operators returned power to 100 percent later that day. On February 15, operators reduced power to approximately 92 percent to facilitate main turbine valve and main steam valve testing. Operators returned power to 100 percent on February 16. 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 January 5, 2013 operators reduced power to approximately 60 percent to facilitate control rod scram time testing, a control rod pattern adjustment, and low pressure main turbine exhaust hood measurements. Operators returned power to 100 percent on January 6. Power was reduced to approximately 90 percent on January 12 to perform control rod scram time testing, a control rod pattern adjustment and to swap operating recirculation pump motor-generator set lubricating oil pumps. Operators returned power to 100 percent on January 13. On February 13, operators reduced power to approximately 86 percent to facilitate control rod scram time testing. Operators also removed the '6B' feedwater heater from service and entered end-of-cycle coastdown and feedwater temperature reduction operations in advance of the Unit 2 refueling outage. Power was returned to 100 percent later that day. On February 10, operators reduced power to approximately 93 percent in response to a reactor pressure and power transient caused by the opening and closure of the main turbine bypass valves due to a momentary ground in the electrical system powering the electro-hydraulic control system. Following the implementation of a modification to the electro-hydraulic control system on February 12, power was returned to 100 percent. On March 24 operators commenced a reactor shutdown, from an initial maximum attainable power level of 97 percent, to commence refueling outage 2R12. At the end of inspection period Unit 2 was in Operational Condition 5 (Refueling).

1. REACTOR SAFETY

Cornerstones: Initiating Events, Mitigating Systems, and Barrier Integrity

1R01 Adverse Weather Protection (71111.01 – 1 sample)

Site Imminent Weather Conditions

a. Inspection Scope

On January 22-26, 2013, the inspectors reviewed Exelon staff's preparations in advance of and during a Cold Weather Alert issued by the National Weather Service for Montgomery County, Pennsylvania. The inspectors performed walkdowns of equipment that could be effected by the cold weather such as the emergency diesel generators (EDGs) and condensate storage tank instruments and verified that freeze protection equipment (e.g., heat trace) was in operation. The inspectors verified that Exelon personnel monitored freeze protection equipment performance and addressed emergent issues.

Enclosure

b. Findings

No findings were identified.

1R04 Equipment Alignment

.1 Partial System Walkdowns (71111.04Q – 3 samples)

a. Inspection Scope

The inspectors performed partial walkdowns of the following systems:

- Unit 1 high pressure coolant injection (HPCI) system when room cooler flow was secured from the 'B' loop of emergency service water (ESW) system on January 31, 2013 (IR 1469581)
- Unit 1 reactor core isolation cooling (RCIC) system when room cooler flow was secured from the 'B' loop of ESW system on January 31, 2013 (IR 1469581)
- EDG D23 when EDG D21 was out-of-service for unplanned maintenance on May 20, 2013

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), TS, work orders, IRs, and the impact of ongoing work activities on redundant trains of equipment in order to identify conditions that could have impacted system performance of their 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 CAP for resolution with the appropriate significance characterization.

b. Findings

No findings were identified.

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

a. Inspection Scope

The inspectors performed a complete system walkdown of accessible portions of the Units 1 and 2 and safeguard direct-current (DC) power system to verify the existing equipment lineup was correct. This included Division I-IV safeguard batteries and battery chargers. The inspectors reviewed operating procedures, surveillance tests, drawings, equipment line-up check-off lists, and the UFSAR to verify the system was aligned to perform its required safety functions. The inspectors also reviewed electrical power availability, equipment cooling, and the operability of support systems. The inspectors performed field walkdowns of accessible portions of the systems to verify system components and support equipment were aligned correctly and operable. The

inspectors examined the material condition of the components and observed operating parameters of equipment to verify that there were no deficiencies. Additionally, the inspectors reviewed a sample of related IRs and work orders to ensure Exelon staff appropriately evaluated and resolved any deficiencies.

b. Findings

No findings were identified.

1R05 Fire Protection

.1 Resident Inspector Quarterly Walkdowns (71111.05Q – 4 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 personnel 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 84 – Unit 2 D23 Diesel Generator and Fuel Oil – Lube Oil Tank Room, Rooms 315C and 316C [F-D-315C Unit 2]
- Fire Area 82 – Unit 1 D14 Diesel Generator Room and Fuel Oil and Lube Oil Tank Room, Rooms 311D and 312D [F-D-311D Unit 1]
- Fire Area 61 – Unit 2 Core Spray Pump Room 'A' [F-R-188 Unit 2]
- Fire Area 80 – Unit 1 D13 Diesel Generator Room and Fuel Oil and Lube Oil Tank Room, Rooms 311C and 312C [F-D-311-C Unit 1]

b. Findings

No findings were identified.

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

a. Inspection Scope

The inspectors reviewed the Unit 1 'B' core spray room unit cooler heat exchanger to determine its readiness and availability to perform its safety functions. The inspectors reviewed the design basis for the component and verified Exelon's commitments to NRC Generic Letter 89-13. The inspectors reviewed the results of previous inspections of the Unit 1 'B' core spray room unit cooler. The inspectors discussed the results of the most recent inspection with engineering staff and reviewed pictures of the as-found and as-left conditions. The inspectors verified that Exelon staff initiated appropriate corrective actions for identified deficiencies. The inspectors reviewed IRs associated with the unit cooler to verify that no adverse trends or degraded conditions existed. The inspectors

also verified that the number of tubes plugged within the heat exchanger did not exceed the maximum amount allowed.

b. Findings

No findings were identified.

1R11 Licensed Operator Regualification Program (71111.11Q – 1 sample)

a. Inspection Scope

The inspectors observed licensed operator simulator training on March 22, 2013, which included just-in-time training for the Unit 2 planned shutdown for Refueling Outage 2R12. The inspectors evaluated operator performance during the simulated shutdown and cooldown and verified completion of risk significant operator actions. The training performed a detailed walk through of shutdown cooling system flushes, placing the shutdown cooling system in operation, and alternate decay heat removal system operations. 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. 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
(71111.11Q - 1 sample)

a. Inspection Scope

The inspectors observed licensed operator performance in the main control room during the period of March 24-25, 2013. The inspectors observed operator performance during the Unit 2 power reduction, planned reactor shutdown, and placement of the shutdown cooling system in service for Refueling Outage 2R12. The inspectors verified operator compliance and use of plant procedures, performance of procedure steps in the proper sequence, alarm response card response and proper TS usage. Pre-job briefs, the use of human error prevention techniques, communications between crew members, and supervision of activities were observed to verify that they were performed consistent with established plant practice.

b. Findings

No findings were identified.

1R12 Maintenance Effectiveness (71111.12Q – 3 samples)

a. Inspection Scope

The inspectors reviewed the samples listed below to assess the effectiveness of maintenance activities on structure, system, or component (SSC) performance and reliability. The inspectors reviewed system health reports, corrective action program documents, maintenance work orders, and maintenance rule basis documents to ensure that Exelon personnel were identifying and properly evaluating performance problems within the scope of the maintenance rule. For each sample selected, the inspectors verified that the SSC was properly scoped into the maintenance rule in accordance with 10 *Code of Federal Regulations* (CFR) 50.65 and verified that the (a)(2) performance criteria established by Exelon staff was reasonable. As applicable, for SSCs classified as (a)(1), the inspectors assessed the adequacy of goals and corrective actions to return these SSCs to (a)(2). Additionally, the inspectors ensured that Exelon personnel were identifying and addressing common cause failures that occurred within and across maintenance rule system boundaries.

- IR 1465500, Main transformers and substations (System 035-01) (a)(1) determination
- IR 1487073, Unit 2 'B' residual heat removal heat exchanger service water inlet valve (HV-051-2F014B) anomaly detected during valves testing
- IR 1490191, HPCI system oil leak discovered from lubricating oil system pressure switch (PSL-056-160) following quarterly test

b. Findings

No findings were identified.

1R13 Maintenance Risk Assessments and Emergent Work Control (71111.13 – 6 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 staff 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 60.65(a)(4) and that the assessments were accurate and complete. When Exelon staff 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.

- Operational risk activity to replace a faulty relay in the Unit 2 'A' recirculation pump motor-generator lubrication oil pump control circuitry on January 14, 2013
- Unit 1 Yellow online risk due to 'A' reactor enclosure recirculation system, 'A' standby gas treatment system, and one offsite power source being unavailable due to EDG D14 testing on January 22, 2013

- Units 1 and 2 increased risk of loss of offsite power and turbine trip as a result of the forecast for high winds on January 30 - 31, 2013
- Unit 1 Yellow online risk due to auxiliary bus 20 and safeguard transformer 201 being unavailable and the emergent inoperability of EDG D11 due to an instrument air line break on February 6, 2013
- Unit 1 online risk and Unit 2 outage risk due to draining 'A' loop residual heat removal service water (RHRSW) for piping replacement during Refueling Outage 2R12
- Unit 2 online risk assessment during the emergent unavailability of EDG D21 due to a DC ground on engine control instrumentation on March 18, 2013

b. Findings

No findings were identified.

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

a. Inspection Scope

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

- IR1462813, EDG D13 intercooler heat exchanger jacket water leak
- IR 1464367, 10CFR Part 21 Notification of potential foreign material in control rod drive mechanisms
- IR 1473450, Unit 2 turbine bypass valve operability during and following turbine stop valve load limit circuitry troubleshooting
- IR 1471008, EDG D22 operability following generator over excitation/low reactive load
- IR 1481691, 1BCD battery charger current limit found low during preventive maintenance activities
- IR 1478866, 2BCB2 battery charger test issues with preconditioning
- IR 1491544, 'C' emergency service water pump failed to auto start

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 technical specification operability was properly justified and the subject component or system remained available such that no unrecognized increase in risk occurred. The inspectors compared the operability and design criteria in the appropriate sections of the technical specifications and UFSAR to completed evaluations to determine whether the components or systems were operable. Where compensatory measures were required to maintain operability, the inspectors determined whether the measures in place would function as intended and were properly controlled. The inspectors determined, where appropriate, compliance with bounding limitations associated with the evaluations.

b. Findings

Introduction. A finding of very low safety significance was identified by the inspectors for the failure to adequately assess the operability of multiple safeguard battery chargers in a timely manner after an IR was generated for battery charger testing concerns.

Description. On February 22, 2013, during a surveillance frequency control program review, Exelon personnel generated IR 1478866, which documented battery charging testing concerns related to the performance of the 24-month battery charger TS surveillance test (ST), ST-4-095-96(1-6)-1(2). Specifically, the IR discussed potential preconditioning concerns with performing the battery charger preventive maintenance (PM) immediately prior to the TS ST and that IRs had not been generated for as-found PM data being found below the TS limit, an unexpected result.

The IR documented that the as-found current limit settings for the 75 amp 1BCD and 300 amp 2BCB2 battery chargers were found below the TS limit (59.9 and 295 amps, respectively, and 21 amps below the previous as-left setting). The operability basis and on-shift review of the IR documented that no operability concern existed because the battery chargers had passed their most recent TS STs and that there was no indication of a current equipment deficiency with the battery chargers. No explanation for the unexpected test results was given in the IR.

On February 27, 2013, the inspectors reviewed IR 1478866 and questioned the current operability of the two battery chargers given that the as-found PM data was below the TS limit during the last PM performance and no apparent cause for the failure was identified either in IR 1478866 or the completed PM work document. Based on NRC Inspection Manual Part 9900: Technical Guidance, "Operability Determinations & Functionality Assessments for Resolution of Degraded or Nonconforming Conditions Adverse to Quality or Safety," the inspectors questioned if a passed ST was sufficient to provide a reasonable assurance of operability when "the supporting basis for the reasonable expectation of SSC operability should provide a high degree of confidence that the SSCs remain operable." In this case, the inspectors concluded the information provided in the IR did not provide supporting information to address the decrease of 21 amps in the current limit setting from the previous as-left TS ST data and the as-found PM data.

The inspectors determined from the information provided in IR 1478866, that a reasonable assurance of operability had not been proved and raised this operability concern to Operations personnel. Exelon staff generated IR 1481691 to address the inspectors' operability question on the 1BCD battery charger current limit setting being found low and to provide additional information to support the immediate operability of the 1BCD battery charger.

Initially, IR 1481691 recommended testing the battery chargers or documenting an evaluation to validate that the current limit card setting were within the required TS range and that current limit card setpoint degradation did not exist. After more questions from the inspectors related to the operability bases of the battery chargers, Exelon staff performed an analysis of the battery charger maintenance history and PM practices which determined that retesting the battery chargers was not required and that battery charger operability had been maintained. The evaluation cited engineering judgement, past operating experience, vendor input and the satisfactory surveillance test results to provide a reasonable assurance of battery charger operability. Further discussions with Exelon personnel revealed that a 21 amp drop in the current limit setting would occur if one of the charger's phase balance boards was not making a good electrical connection. The inspectors reviewed the additional operability evaluation contained in IRs 1481691 and 1486278, and determined that a reasonable assurance of operability did exist because the as-found current limit settings on the 1BCD and 2BCB2 battery chargers

were approximately 21 amps less than the prior as-left settings and that it was reasonable that PM activities performed prior to taking the measurements could have reasonably disturbed the phase balance boards' electrical connections.

Exelon's Issue Identification and Screening Process procedure, LS-AA-120, Step 4.4.6 – 3 states that “once an issue has been identified, determine if the operability of any SSC is affected by the condition described in the issue and document the basis of the determination. Initiate an operability evaluation assignment and notify the assigned organization in accordance with OP-AA-108-115, ‘Operability Determinations,’ if additional information or analysis is required to determine operability.” The inspectors determined that based on LS-AA-120, Exelon staff should have initiated an operability evaluation during the on-shift review of IR 1478866 and not after the inspectors questioned the validity of the surveillance test results as the sole bases for battery charger operability. As a result of the inspector's question, Exelon personnel determined that preventive maintenance activities in the battery charger cabinets likely disturbed cards and impacted subsequent as-found test results.

Exelon staff entered this issue into their CAP as IR1486275 and planned to perform an evaluation to address the battery charger initial operability determination. Exelon staff revised the operability bases to include a discussion of the effect of poor electrical connections between one of the chargers' phase balance boards and the charger, the PM activities which could have disturbed the electrical connections, and a discussion of the operability basis of the 2BCD2 charger. Exelon staff also documented IR 1482020 to address their staff not initiating an IR for unexpected battery charger test results.

Analysis. The inspectors determined that the failure to adequately assess the operability of multiple safeguard battery chargers in a timely manner after an IR was generated for battery charger testing concerns was a performance deficiency that was reasonably within Exelon personnel's ability to foresee and correct, and should have been prevented. The inspectors determined that the performance deficiency was more than minor because it was associated with the Human Performance attribute of the Mitigation Systems cornerstone and affected the cornerstone objective of ensuring the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences (i.e., core damage). This finding was also similar to examples 3.j and 3.k of Inspection Manual Chapter (IMC) 0612, Appendix E. Specifically, in the absence of any further engineering evaluation, there was reasonable doubt of operability of multiple safeguard battery chargers at power operations. This finding was evaluated in accordance with NRC IMC 0609, Attachment 4, “Phase 1 – Initial Screening and Characterization of Findings,” and determined to be of very low safety significance (Green) because the finding does not affect the operability of the system, does not represent a loss of system and/or function, and does not represent an actual loss of function of at least a single train for greater than its technical specification allowed outage time.

The inspectors determined that the finding had a cross-cutting aspect in Human Performance, Decision-Making, because Exelon staff did not make a safety-significant decision using a systematic process, especially when faced with uncertain or unexpected plant conditions, to ensure that safety was maintained. Specifically, Exelon staff did not adequately assess the operability of multiple safeguard battery chargers in a timely manner after an IR was generated for battery charger testing concerns that called into question the operability of multiple safeguard battery chargers. [H.1(a)]

Enforcement. Enforcement action does not apply because the performance deficiency did not involve a violation of a regulatory requirement. Because this finding does not involve a violation of regulatory requirements and has very low safety significance, it is identified as **FIN 05000352/2013002-01, Failure to Adequately Assess Battery Charger Operability in a Timely Manner.**

1R18 Plant Modifications (71111.18 – 2 samples)

.1 Temporary Modifications

a. Inspection Scope

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

- Temporary Change 12-0587 (TRT 13-016), Disable Electro-hydraulic Control System Stop Valve Load Limit Logic
- Temporary configuration change (TRT 12-135) associated with a temporary electrical jumper installed in the 'B' standby gas treatment train heater circuit.

b. Findings

No findings were identified.

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

a. Inspection Scope

The inspectors reviewed the post-maintenance tests for the maintenance activities listed below to verify that procedures and test activities 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 was consistent with the information in the applicable licensing basis and/or design basis documents, and that the procedure had been properly reviewed and approved. The inspectors also witnessed the test or reviewed test data to verify that the test results adequately demonstrated restoration of the affected safety functions.

- C0246286, EDG D14 jacket water cooling system leak
- ST-6-092-931-1, EDG D11 Governor/Voltage Regulator Post Maintenance Test
- C0246481, EDG D11 generator end main bearing lubricating oil boost air supply line broken
- C0242666, 'C' residual heat removal service water pump replacement
- M1898424, Adjust fuel rack linkage on EDG D13

b. Findings

No findings were identified.

1R20 Refueling and Other Outage Activities (71111.20 – 1 partial sample)a. Inspection Scope

The inspectors reviewed the station's work schedule and outage risk plan for the Unit 2 maintenance and refueling outage (2R12), which commenced on March 25, 2013. The inspectors reviewed the development and implementation of outage plans and schedules to verify that risk, industry experience, previous site-specific problems, and defense-in-depth, were considered. At the end of the inspection period, Unit 2 was in Operational Condition 5 (Refueling), with the reactor cavity flooded. This sample will be completed in the second quarter of 2013 after Unit 2 returns to Operational Condition 1 (Power Operation). During the outage, the inspectors observed portions of the shutdown and cooldown processes and monitored controls associated with the following outage activities:

- Configuration management, including maintenance of defense-in-depth, commensurate with the outage plan for the key safety functions and compliance with the applicable Technical Specifications when taking equipment out of service
- Implementation of clearance activities and confirmation that tags were properly hung and that equipment was appropriately configured to safely support the associated work or testing
- Installation and configuration of reactor coolant pressure, level, and temperature instruments to provide accurate indication and instrument error accounting
- Status and configuration of electrical systems and switchyard activities to ensure that Technical Specifications were met
- Monitoring of decay heat removal operations
- 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 Technical Specifications
- Refueling activities, including fuel handling and fuel receipt inspections
- Fatigue management
- Identification and resolution of problems related to refueling outage activities

b. Findings

No findings were identified.

1R22 Surveillance Testing (71111.22 – 6 Routine, 1 In-Service Test [IST])a. Inspection Scope

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

- ST-6-048-231-2, Standby Liquid Control Pump Comprehensive Test performed on Unit 2 'B' standby liquid control pump (IST)
- ST-6-052-231-1, 'A' Core Spray Pump Valve and Flow Test
- ST-5-092-312-2, D22 Diesel Generator Slow Start Operability Run
- ST-6-092-323-1, D13 Diesel Generator Loss-of-Coolant Accident/Load Reject Testing and Fast Start Operability Test Run
- ST-2-074-642-2, Source Range and Intermediate Range Neutron Monitor Pre-Shutdown Functional Test
- ST-1-103-300-2, 24 Month Snubber Functional Test Program performed on Unit 2
- ST-2-001-800-2, Main Turbine Bypass System Response Test and System Automatic Actuation

b. Findings

No findings were identified.

Cornerstone: Emergency Preparedness

1EP4 Emergency Action Level and Emergency Plan Changes (71114.04 – 1 sample)

a. Inspection Scope

NRC staff from the Office of Nuclear Security and Incident Response performed an in-office review of the latest revisions of various Emergency Plan Implementing Procedures and the Emergency Plan located under Agency Wide Documents Access and Management System (ADAMS) accession numbers ML123260651 and ML130180297 as listed in the Attachment.

Exelon staff determined that in accordance with 10 CFR 50.54(q), the changes made in the revisions resulted in no reduction in the effectiveness of the Plan, and that the revised Plan continued to meet the requirements of 10 CFR 50.47(b) and Appendix E to 10 CFR Part 50. The NRC review was not documented in a safety evaluation report and did not constitute approval of licensee-generated changes; therefore, this revision is subject to future inspection. The specific documents reviewed during this inspection are listed in the Attachment.

b. Findings

No findings were identified.

2. RADIATION SAFETY

Cornerstone: Occupational Radiation Safety

2RS1 Access Control to Radiologically Significant Areas (71124.01)

a. Inspection Scope

During March 4 - 8, 2013, the inspectors reviewed selected activities, and associated documentation, in the areas listed below. The evaluation of performance was against criteria contained in 10 CFR Part 20, applicable TS, Regulatory Guides, the UFSAR, and applicable station procedures.

Inspection Planning

The inspectors reviewed Performance Indicators (PI) for the Occupational Exposure Cornerstone and recent radiation protection program audits and assessments.

Radiological Hazard Assessment

The inspectors discussed plant operations to identify any significant new radiological hazards for onsite workers or members of the public and assessed the potential impact of the changes and monitoring on the detection and quantification of radiological hazards.

Contamination and Radioactive Material Control

The inspectors observed locations where Exelon personnel monitors potentially contaminated material leaving the radiological controlled area, and inspected the methods used for control, survey, and release from these areas. The inspectors selectively evaluated the radiation monitoring instrumentation sensitivity.

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

The inspectors discussed the controls and procedures for high-risk high radiation areas and very high radiation areas and any procedural changes since the last inspection.

Radiation Worker Performance and Radiation Protection Technician Proficiency

The inspectors selectively reviewed radiological problem reports since the last inspection to identify human performance errors and determine if there were any observable patterns. The inspectors discussed corrective actions for identified concerns.

Problem Identification and Resolution

The inspectors determined if problems associated with radiation monitoring and exposure control were being identified by Exelon personnel at an appropriate threshold and were placed in the corrective action program. The inspectors discussed corrective actions for identified concerns.

b. Findings

No findings were identified.

2RS2 Occupational as Low as is Reasonably Achievable Planning and Controls (71124.02)

a. Inspection Scope

During March 4 - 8, 2013, the inspectors assessed performance with respect to maintaining occupational individual and collective radiation exposures as low as is reasonably achievable (ALARA). The evaluation of performance was against criteria contained in 10 CFR Part 20, applicable TS, Regulatory Guides, the UFSAR, and applicable station procedures.

Inspection Planning

The inspectors reviewed pertinent information regarding plant collective exposure history, current exposure trends, and ongoing or planned activities in order to assess current performance and exposure challenges. The inspectors evaluated and determined the site-specific trends in collective exposures.

Radiological Work Planning

The inspectors reviewed a list of Unit 2 outage planned work activities ranked by actual or estimated exposure. These included reactor disassembly, reactor cavity decontamination, suppression pool work, scaffolding, in-service inspection, control rod drive work, and valve work. The inspectors reviewed ALARA work activity plans and evaluations, exposure estimates, and exposure mitigation requirements to identify if appropriate dose mitigation features were provided. The inspectors verified the integration of ALARA requirements into work procedure and radiation work permit documents.

Source Term Reduction and Control

The inspectors determined historical trends and current status of significant tracked plant source terms known to contribute to elevated facility aggregate exposure. The inspectors discussed the chemistry plans for source term reduction (e.g., Cobalt reduction), contingency plans for potential changes in the source term, and source term reduction efforts, including system flushing and use of additional demineralization and filtration systems.

Problem Identification and Resolution

The inspectors determined if problems associated with ALARA planning and controls were being identified by Exelon personnel at an appropriate threshold and were properly addressed for resolution in the CAP. The inspectors discussed corrective actions.

b. Findings

No Findings were identified

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

a. Inspection Scope

During March 4 - 8, 2013, the inspectors assessed performance with respect to control and mitigation of airborne radioactivity. The evaluation of performance was against criteria contained in 10 CFR Part 20, applicable TS, Regulatory Guides, the UFSAR and applicable station procedures. The inspectors selectively reviewed procedures for maintenance, inspection, and use of respiratory protection equipment including procedures for air quality maintenance.

Inspection Planning

The inspectors discussed airborne radiation areas and any associated ventilation systems or airborne monitoring instrumentation, selectively reviewed the respiratory protection program and types of respiratory devices used, and reviewed the reported Performance Indicators.

Engineering Controls

The inspectors evaluated the use of selected ventilation systems to control airborne radioactivity. The inspectors evaluated Exelon's personnel use of decision criteria for evaluating levels of hard-to-detect airborne radionuclides.

Use of Respiratory Protection Devices

The inspectors evaluated the Exelon's personnel use of respiratory protective devices to maintain occupational doses ALARA including use of certified devices. The inspectors reviewed records of air testing for supplied-air devices and self-contained breathing apparatus (SCBA) bottles.

SCBA for Emergency Use

The inspectors reviewed surveillance records of selected SCBAs staged in-plant for use during emergencies including the capability for refilling and transporting SCBA air bottles to areas of use.

The inspectors selected three individuals on control room shift crews and from designated departments to assess whether personnel were trained and qualified in the use of SCBA. The inspectors: 1) determined if appropriate masks (sizes and types) were available for use; 2) verified by direct observation that personnel had no facial hair that would interfere with the sealing of the mask; and 3) determined whether vision correction mask inserts were available.

The inspectors reviewed the past two years of maintenance records for two SCBA units to assess maintenance, repair, and testing and verified that periodic air cylinder hydrostatic testing was documented and up-to-date.

Problem Identification and Resolution

The inspectors reviewed and discussed problems associated with the control and mitigation of in-plant airborne radioactivity to evaluate identification and resolution in the corrective action program.

b. Findings

No findings were identified.

2RS4 Occupational Dose Assessment (71124.04)

a. Inspection Scope

During March 4 - 8, 2013, the inspectors selectively reviewed occupational dose assessment. The evaluation of performance was against criteria contained in 10 CFR Part 20, applicable TS, Regulatory Guides, the UFSAR, and applicable station procedures.

Inspection Planning

The inspectors reviewed available radiation protection program audits related to internal and external dosimetry and corrective action documents to gain insights into overall performance in the area of dose assessment.

The inspectors reviewed the most recent National Voluntary Laboratory Accreditation Program (NVLAP) accreditation report for Exelon's dosimetry.

The inspectors selectively reviewed procedures associated with dosimetry operations, including issuance/use of external dosimetry (routine, multi-badging, extremity, neutron, etc.), assessment of internal dose (operation of whole body counter, assignment of dose based on derived air concentration, hours, urinalysis, etc.), and evaluation of and dose assessment for radiological incidents. The inspectors evaluated procedure guidance for personnel monitoring.

External Dosimetry

The inspectors evaluated the use of personnel dosimeters that required processing, to verify NVLAP accreditation. The inspectors determined if Exelon uses a "correction factor" to address the response of the electronic dosimeter as compared to its NVLAP accredited dosimeter for situations when the electronic dosimeter must be used to assign dose.

Internal Dosimetry

The inspectors reviewed routine bioassay (in vivo, In vitro) procedures used to assess dose from internally deposited nuclides.

Problem Identification and Resolution

The inspectors reviewed corrective action documents to verify that problems associated with occupational dose assessment were being identified at an appropriate threshold and were properly addressed for resolution in the corrective action program.

b. Findings

No findings were identified.

2RS5 Radiation Monitoring Instrumentation (71122.05)

a. Inspection Scope

During March 4 - 8, 2013, the inspectors reviewed radiation monitoring instrumentation. The evaluation of performance was against criteria contained in 10 CFR Part 20, applicable TS, Regulatory Guides, the UFSAR, and applicable station procedures.

Post-Accident Monitoring Instrumentation

The inspectors selectively reviewed the calibration documentation for the drywell high-range monitors including electronic calibration. The inspectors also assessed calibration acceptance criteria and evaluated the calibration and availability of one high range effluent monitor relied on in emergency operating procedures for initiating emergency action levels and subsequent emergency classifications.

Calibration and Check Sources

The inspectors reviewed the latest 10 CFR Part 61 waste stream report to determine if the calibration sources used were representative of the types and energies of radiation encountered in the plant.

Problem Identification and Resolution

The inspectors reviewed corrective action documents associated with radiation monitoring instrumentation to determine if identified issues were placed in the corrective action program for resolution. The inspectors evaluated the appropriateness of the corrective actions for a selected sample of problems documented that involved radiation monitoring instrumentation.

b. Findings

No findings were identified

2RS6 Radioactive Gaseous and Liquid Effluent Treatment (71124.06)

a. Inspection Scope

During March 4 - 8, 2013, the inspectors reviewed the treatment, monitoring, and control of effluent releases. The evaluation of performance in this area was based on criteria contained in 10 CFR Part 20; 10 CFR Part 50, Appendix A - Criterion 60 Control of

Release of Radioactivity to the Environment and Criterion 64 Monitoring Radioactive Releases; 10 CFR 50, Appendix I, Numerical Guides for Design Objectives and Limiting Conditions for Operations to Meet the Criterion ALARA for Radioactive Material in Light-Water – Cooled Nuclear Power Reactor Effluents; applicable Technical Specifications and industry standards, Exelon's procedures, and the UFSAR.

Air Cleaning Systems

The inspectors reviewed and verified acceptable surveillance test results high-efficiency particulate air and charcoal filtration) for the Standby Gas Treatment System and Reactor Enclosure Recirculation System.

b. Findings

No findings were identified.

4. OTHER ACTIVITIES

4OA1 Performance Indicator Verification (71151)

.1 Unplanned Power Changes (2 samples)

a. Inspection Scope

The inspectors sampled submittals for the Unplanned Power Changes (IE03) PI for both Unit 1 and Unit 2 for the period of January 1, 2012, through December 31, 2012. To determine the accuracy of the PI data reported during those periods, the inspectors used definitions and guidance contained in the Nuclear Energy Institute Document 99-02, "Regulatory Assessment Performance Indicator Guideline," Revision 6. The inspectors reviewed Exelon's operator narrative logs, maintenance planning schedules, and NRC integrated inspection reports to validate the accuracy of the submittals.

b. Findings

No findings were identified.

.2 Mitigating Systems Performance Index – Heat Removal System (4 samples)

a. Inspection Scope

The inspectors reviewed submittal of the Mitigating Systems Performance Index for the following systems for the period of January 1, 2012 through December 31, 2012:

- Units 1 and 2 High Pressure Injection System (MS07)
- Units 1 and 2 Heat Removal System (MS08)

To determine the accuracy of the PI data reported during those periods, the inspectors used definitions and guidance contained in Nuclear Energy Institute Document 99-02, "Regulatory Assessment Performance Indicator Guideline," Revision 6. The inspectors also reviewed Exelon's operator narrative logs, IRs, 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)

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 personnel 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.

b. Findings

No findings were identified.

.1 Annual Sample: Review of the Operator Workaround Program

a. Inspection Scope

The inspectors reviewed the cumulative effects of the existing operator workarounds, operator burdens, existing operator aids and disabled alarms, and open main control room deficiencies to identify any effect on emergency operating procedure operator actions, and any impact on possible initiating events and mitigating systems. The inspectors evaluated whether station personnel had identified, assessed, and reviewed operator workarounds as specified in Exelon procedure OP-AA-102-103, "Operator Work-Around Program," Revision 3, and OP-AA-102-103-1001, "Operator Burden and Plant Significant Decision Impact Assessment Program," Revision 4.

The inspectors reviewed Exelon's process to identify, prioritize and resolve main control room distractions to minimize operator burdens. The inspectors reviewed the system used to track these operator workarounds and recent Exelon self-assessments of the program. The inspectors also toured the control room and discussed the current operator workarounds with the operators to ensure the items were being addressed on a schedule consistent with their relative safety significance.

b. Findings and Observations

No findings were identified.

The inspectors determined that the issues reviewed did not adversely affect the capability of the operators to implement abnormal or emergency operating procedures. The inspectors also verified that Exelon personnel entered operator workarounds and burdens into the CAP at an appropriate threshold and planned or implemented corrective actions commensurate with their safety significance.

.2 Annual Sample: Technical Specification Surveillance Test Pre-conditioning

a. Inspection Scope

The inspectors performed an in-depth review of the evaluation and corrective actions associated with their discovery related to safeguard battery charger and nuclear instrumentation testing concerns documented in IRs 1478866 and 1483039, respectively. Specifically, in both cases, safety-related equipment was identified to be potentially pre-conditioned because associated PM activities were conducted just prior to the TS ST.

To determine whether Exelon personnel was appropriately identifying, characterizing, and correcting problems associated with this issue, the inspectors assessed: problem identification threshold; cause analyses; extent of condition reviews; compensatory actions; and the prioritization, timeliness, and adequacy of corrective actions. The inspectors also reviewed operating experience review documentation, interviewed operations and maintenance personnel, observed in-plant testing of multiple TS systems, sampled the 2R12 outage schedule for TS systems with 24 month STs and reviewed Exelon's corrective action process documentation.

b. Findings and Observations

A licensee-identified, non-cited violation related to this issue is described in Section 4OA7 of this report.

On February 22, 2013, Exelon personnel generated IR 1478866 identifying that during the safeguard battery charger PM, the current limit set point for the charger could be found below the TS requirement and be adjusted back above the TS limit just prior to conducting the TS required 24 month safeguard battery charger load ST. This potential pre-conditioning issue was previously identified in June 2003 (IR 162284). At the time, the NRC resident inspectors documented a Green FIN in the quarterly inspection report (2003003) concerning the performance of PM prior to the required ST of the reactor recirculation pump trip breakers and the safety-related battery chargers. The performance deficiency was that the extent-of-condition for potential pre-conditioning concerns related to the main steam isolation valve testing (IR 146966) was too narrowly focused and did not identify and properly evaluate the testing sequence for the reactor recirculation pump trip breakers and the safety-related battery chargers.

On March 4, 2013, Exelon personnel generated IR 1483039 identifying that during source range monitor and intermediate range monitor pre-refueling outage PM instrument calibration parameters are documented and allowed to be adjusted prior to the TS required calibration ST.

The inspectors reviewed the corrective actions associated with IR 162284. During this review, the inspectors identified that Exelon's corrective actions to revise the battery

charger maintenance procedure, M-095-006, and perform an operability determination for the safeguard battery chargers were ineffective. These corrective actions did not to evaluate the testing sequence and address the initial pre-conditioning concern. The performance deficiency is described in Section 4OA7 of this report.

As a result of these preconditioning concerns, the inspectors sampled a number of safety-related TS systems that were scheduled to have 24 month PMs and STs performed during the 2R12 outage. These systems included reactor recirculation, reactor core isolation cooling, containment systems, reactor protection system, nuclear instrumentation, and safeguard DC power. The inspectors selected these systems based on the recently generated IRs concerning potential preconditioning issues and IR 146966 actions 31 through 59 generated to review potential preconditioning concerns for the 2R08 outage in 2005.

The inspectors determined that the issues reviewed did not constitute preconditioning with the exception of the licensee-identified violation in Section 4OA7 of this report. The inspectors verified that Exelon personnel entered potential preconditioning concerns into the CAP at an appropriate threshold and planned or implemented corrective actions commensurate with their safety significance where appropriate.

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

.1 Plant Events (1 sample)

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 personnel made appropriate emergency classification assessments and properly reported the event in accordance with 10 CFR Parts 50.72 and 50.73. The inspectors reviewed follow-up actions related to the events to assure that Exelon staff implemented appropriate corrective actions commensurate with their safety significance.

- Unit 2 power transient due electro-hydraulic system malfunction on February 10, 2013
- Loss of communication with emergency planning zone sirens on December 28, 2012

b. Findings

No findings were identified.

4OA5 Other Activities

.1 Followup Inspection for Three or More Severity Level IV Traditional Enforcement Violations in the Same Area in a 12-Month Period (92723)

a. Inspection Scope

The inspectors performed a follow-up inspection for three Severity Level (SL) IV Traditional Enforcement violations in the area of Impeding Regulatory Process that were issued between in September 2011 and August 2012. The first violation involved improper implementation of an Emergency Action Level bases change (EA-11-128), the second involved an untimely 10 CFR 50.72 report for a radiological spill (EA-12-070), and the third involved an incomplete 10 CFR 50.73 report related to a period of RCIC system inoperability (EA-12-165).

The objectives of the inspection were to determine whether Exelon staff:

- Provided assurance that the causes of the SL IV Traditional Enforcement violations were understood
- Provided assurance that the extent of condition and extent of cause of the SL IV Traditional Enforcement violations were identified
- Provided assurance that corrective actions for the SL IV Traditional Enforcement violations were sufficient to address the causes

The inspectors reviewed the collective Common Cause Analysis evaluation for the violations, an Exelon Corporate level Common Cause Analysis completed for all Exelon fleet traditional enforcement violations in 2011 and 2012, focused area self-assessments, the apparent cause evaluation (ACE) and/or root cause evaluation conducted for each specific violation, related condition reports, procedures, and relevant references. The inspectors also interviewed management and staff personnel who were familiar with the violations and participated in the evaluation or corrective actions.

b. Findings and Observations

No findings were identified.

The inspectors concluded that Exelon staff completed a timely and adequate Common Cause Analysis that used a systematic method to identify the causes of the Traditional Enforcement violations. Exelon personnel considered the primary common cause to be flawed decision making associated with regulatory sensitive issues which were not identified during the approval process. Exelon staff also identified that the guidance for making these regulatory decisions was insufficient in some cases. The staff also conducted a fleet level Common Cause Analysis and identified weakness in the areas of 10 CFR 50.59 process and 10 CFR 50.72 and .73 reportability. Corrective actions included revising training programs, revising LS-AA-1120, "Exelon Reportability Reference Manual," and working with the NRC to improve the guidance pending revision of NUREG 1022, "Event Reporting Guidelines 10 CFR 50.72 and 50.73."

The inspectors determined that the station adequately assessed the extent of condition and extent of cause of the violations. The inspectors concluded that Exelon's corrective actions were sufficient to address the identified common cause and that the completed and planned corrective actions addressed the causes described in the evaluation. Additionally, although not required by the CAP procedure, effectiveness review was scheduled to review the effectiveness of the Common Cause Corrective actions.

.2 Followup Inspection for a Severity Level IV Traditional Enforcement Violation Involving Deliberate Misconduct (92702)

a. Inspection Scope

The inspectors performed a follow-up inspection for the SL IV Traditional Enforcement violation (EA-12-190) discussed in NRC Letter, dated October 18, 2012 (ML12292A140). This letter documented an NRC Office of Investigation review to determine whether a contract foreman deliberately failed to follow procedures on the use of electronic dosimetry while at Limerick (NRC Investigation Report Number 1-2012-030). The NRC concluded that the contract foreman deliberately failed to follow an NRC-required procedure (RP-AA-1008) regarding the use of dosimetry and that the issue was documented as SLIV NCV 05000352, 353/2012005-03. In accordance with NRC Inspection Procedure 92702, "Follow up on Traditional Enforcement Actions Including Violations, Deviations, Confirmatory Action Letters, Confirmatory Orders, and Alternate Dispute Resolution Confirmatory Orders," follow up inspection will be conducted on all traditional enforcement for willful violations.

The objectives of the inspection were to determine whether Exelon staff:

- Provided assurance that the causes of the violation is understood
- Provided assurance that the generic implications have been addressed
- Provided assurance that programs and practices have been appropriately enhanced to prevent recurrence

The inspectors reviewed the Common Cause Analysis evaluation for the potentially willful issues from that occurred between 2010-2012 violations, focused area self-assessments, related condition reports, procedures, and relevant references. The inspectors also interviewed management and staff personnel who were familiar with the violation and participated in the evaluation or corrective actions.

b. Findings and Observations

No findings were identified.

The inspectors concluded that Exelon staff completed a timely and adequate Common Cause Analysis that used a systematic method to identify the causes of the Traditional Enforcement violations. The primary common cause to be flawed decision making by individuals due to the perception the activity was low risk. The Common Cause Analysis identified eight IRs since 2010 which involved potentially willful misconduct. The issues involved Radiological Work Practices and Security Policies. Exelon staff had informed the NRC of these issues as appropriate. Corrective actions included actions disciplinary actions, site wide communications, work group stand-downs, enhancements to site training, and pre outage briefings.

The inspectors determined that the station adequately assessed the extent of condition and extent of cause of the violations. The inspectors concluded that corrective actions were sufficient to address the identified common cause and that the completed and planned corrective actions addressed the causes described in the evaluation. Additionally, although not required by the CAP procedure, effectiveness review was scheduled to review the effectiveness of the Common Cause Corrective actions.

- .3 Limerick Generating Station, Units 1 and 2 - Audit of the Licensee's Management of Regulatory Commitments, dated February 27, 2013: The audit identified two findings related to adherence to Exelon's regulatory commitment procedures. The inspectors

reviewed the findings associated from the audit for performance deficiencies. The first finding was related to the timeliness of completing a commitment that was created on August 2, 2000 to develop a procedure to ensure the electrical connection on the main transformers are independently verified and tested following maintenance. Exelon personnel had identified that the commitment tracking database had not been updated in 2007 and wrote IR 574721. The commitment tracking database was not annotated as completed until October 14, 2009. The second finding was related to the timeliness of completing a commitment to revise a battery charger load test procedure to verify the proper settings of alarm points. This action was not completed until approximately 2.5 years after the commitment due date of August 15, 2002. Per procedure, Exelon staff should have either implemented the commitment by the due dates or changed the due dates. Exelon personnel entered the issue into the CAP. Although the late implementation of the commitments was contrary to Exelon procedure requirements, the audit findings were determined to be of minor significance, did not indicate a programmatic problem with the commitment management program, and there was no impact to plant operations.

4OA6 Meetings, Including Exit

On April 5, 2013, the inspectors presented the inspection results to Mr. T. Dougherty, Site Vice President, and other members of the Limerick staff. The inspectors verified that no proprietary information was retained by the inspectors or documented in this report.

4OA7 Licensee-Identified Violations

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

- 10 CFR Part 50, Appendix B, Criterion XVI, Corrective Action, states, in part, that, "In the case of significant conditions adverse to quality, the measures shall assure that the cause of the condition is determined and corrective action taken to preclude repetition." Contrary to the above, Exelon staff completed corrective actions in response to previously identified pre-conditioning concerns with the collection of the safeguard battery charger TS ST as-found data that was ineffective at precluding reoccurrence of the safeguard battery charger preconditioning. Specifically, the corrective action to revise the safeguard battery charger maintenance procedure did not ensure the as-found current limit setpoint was recorded prior to the cleaning, inspection and potential manipulation of the control circuit cards, which can have a significant impact on the as-found current limit setpoint. This ineffective corrective action lead the site to repeat the potential preconditioning of the safeguard battery chargers for nearly 10 years and called into question whether or not the safeguard battery chargers would perform satisfactorily when in service. Exelon personnel entered the issue into the corrective action program as IR 1478866 and have revised the maintenance procedure to include recording the as-found current limit setpoint prior to any other battery charger manipulation. Because the violation was of very low safety significance (Green) and it was entered into Exelon's corrective action program, the violation is being treated as a non-cited violation.

ATTACHMENT: SUPPLEMENTARY INFORMATION

SUPPLEMENTARY INFORMATION

KEY POINTS OF CONTACT

Licensee Personnel

T. Dougherty, Site Vice President
 D. Lewis, Plant Manager
 R. Kreider, 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
 M. Gillin, Shift Operations Superintendent. Manager, Engineering Systems
 M. DiRado, Manager, Engineering Programs
 M. Bonifanti, Manager, ECCS Systems
 L. Harding, Regulatory Assurance Engineer
 D. Molteni, Licensed Operator Requalification Training Supervisor
 A. Wasong, Training Director
 R. Ruffe, Operations Training Manager
 M. DiRado, Manager, Engineering Programs
 D. Merchant, Radiation Protection Manager
 C. Gerdes, Chemistry Manager
 A. Varghese, System Manager, Radiation Instruments
 M. Bonanno, Electrical Plant Engineering Manager
 R. Nealis, Radiochemist
 T. Kan, License Coordinator
 J. Risteter, Radiological Technical Manager
 L. Birkmire, Manager, Environmental
 S. Gamble, Regulatory Assurance Engineer
 K. Rahn, Regulatory Assurance Engineer
 K. Nicely, Exelon Corporate Regulatory Assurance
 R. Lance, Chemistry Manager
 N. Harmon, Senior Technical Specialist
 R. Woolverton, System Manager
 M. McGill, Senior Engineer
 C. Boyle, Instrument Chemist

LIST OF ITEMS OPENED, CLOSED, DISCUSSED, AND UPDATED

Opened/Closed

05000352/2013002-01	FIN	Failure to Adequately Assess Battery Charger Operability in a Timely Manner (Section 1R15)
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Closed

None.

Discussed

05000352,353/2012002-01	NCV	Failure to Make a 10 CFR 50.72 (b)(2)(xi) Notification (Section 40A5.1)
05000352, 353/2011503-01	NCV	Changes to EAL Basis Decreased the Effectiveness of the Plan without Prior NRC Approval (40A5.1)
05000353/2012008-01	NCV	Failure to Submit an Licensee Event Report (LER) Revision for Conditions Prohibited by TS Associated with the HPCI and RCIC Systems (Section 40A5.1)
05000352,353/2012005-03	NCV	Failure to Follow Radiation Protection Procedures for Personnel Monitoring (Section 40A5.2)

LIST OF DOCUMENTS REVIEWED**Section 1R01: Adverse Weather Protection**Issue Reports

1465671	1465605	1465612	1465183	1464175	1466152
1464626					

Procedures

SE-9, Preparation for Severe Weather, Revision 30

Section 1R04: Equipment AlignmentIssue Reports

1490236	1414472	819083	1490105	1487372	1485898
1458405	1469581	1371652	1088981		

Procedures

S92.9.N, Routine Inspection of the Diesel Generators, Revision 62
 ST-6-055-230-1, HPCI Pump, Valve and Flow Test, Revision 78
 S92.3.N, Receiving Diesel Fuel Oil Delivery, Revision 37
 ST-6-011-231-0, 'A' Loop ESW Pump, Valve and Flow Test, Revision 70

Miscellaneous

R1249805-01
 PM 385033

Section 1R05: Fire Protection**Issue Reports**

1480133 1459009 1457967

Procedures

ST-2-022-624-2, Fire Detection – Fire Detection Flame Detector Functional Test Zone 83, Revision 0

ST-2-022-640-2, Fire Detection – Heat Detection Instrumentation Channel Functional Test and Supervisory Circuit Operability Test, Zones 56 and 57, Revision 14

F-D-315C Unit 2, D23 Diesel Generator Room and Fuel Oil – Lube Oil Tank Room, Rooms 315C and 316C, Revision 8

F-D-311D Unit 1, D14 Diesel Generator Room and Fuel Oil – Lube Oil Tank Room, Rooms 311D and 312D, Revision 7

F-R-188 Unit 2, Core Spray Pump Room A, Revision 5

F-D-311C Unit 1, D13 Diesel Generator Room and Fuel Oil – Lube Oil Tank Room, Rooms 311C and 312C, Revision 7

Section 1R07: Heat Sink Performance**Issue Reports**

1474035 1256276 1370280 1365849 1286439

Procedures

RT-2-011-252-0, ESW Loop B Flow Balance, Revision 24

RT-2-011-394-1, 1EV211 Core Spray Room Cooler Air to Water Heat Transfer Test, Revision 10

RT-1-011-390-0, ESW Room Cooler Heat Exchanger Performance Calculation Test, Revision 8

Miscellaneous

R1181145

R1105484

Section 1R11: Licensed Operator Regualification Program**Miscellaneous**

Simulator Training Lesson Plan LGJITT 1302-04, Shutdown Cooling Flushes-Alternate Shutdown Cooling Operations, Revision 0

Section 1R12: Maintenance Effectiveness**Issue Reports**

1465500 1487073 1088509 469813 1490191 1332374
1350443 1344540 1494735 1449120

Procedures

ER-LG-310-1010, Maintenance Rule Implementation, Revision 16
 ER-AA-310-1005, Att. 2, (a)(1) Determination Template, Revision 6
 ER-AA-310-1001, Maintenance Rule – Scoping, Revision 4
 ST-2-036-600-0, Seismic Monitoring, Revision 17
 ER-AA-20, Equipment Reliability Program Description, Revision 3
 ER-AA-1200, Critical Component Failure Clock, Revision 9
 MA-AA-716-210, Performance Centered Maintenance (PCM Templates), Revision 14

Miscellaneous

PM 1602954
 R1058332
 Maintenance Strategy: LG-1-055-I-S-PSL-056-160, (IQ Review 3/20/13)
 Maintenance Strategy: LG-2-049-I-S-PSL-050-201, (IQ Review 3/20/13)
 ECR-01-00160

Section 1R13: Maintenance Risk Assessments and Emergent Work ControlIssue Reports

1461832	1489297	1481587	1481588	1481849
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Procedures

WC-AA-104, Integrated Risk Management, Revision 18
 WC-LG-101-1001, Guideline for the Performance of On-Line Work/On-Line System Outages, Revision 21
 WC-AA-101, On-Line Work Control Process, Revision 19
 S91.2.B, 20 Station Auxiliary Bus Outage with Both Units Operating, Revision 15
 SP-216, Replacement of 'A' Loop RHRSW Return Piping during 2R12, Revision 0
 RT-2-095-900-2, Locations of Battery Grounds, Revision 19

Miscellaneous

Work Order C0246137, Replace B32A-K32A
 2R12 Shutdown Safety Plan 2/21/2013
 Clearance 12002258, Replace 'A' Loop RHRSW Return Piping
 ECR-13-00129
 ARC-MCR-220-G5, 2 Unit Div 1 SFGD Battery Ground, Revision 35
 A1158702

Section 1R15: Operability EvaluationsIssue Reports

737066	911901	1491544	1473450	917231	911901
1473456	1484169	1477164	1471008	1478866	1481691
1482020	1486275	1486278	162284	308096	146966
1495928	1487144	1495051			

Procedures

OP-AA-108-115, Operability Determinations, Revision 11
 ST-6-092-313-1, D13 Diesel Generator Slow Start Operability Test Run, Revision 93
 ST-6-092-115-2, D21 Diesel Generator 4Kv SFGD Loss of Power LSF-SAA and Outage Testing, Revision 17

ST-2-041-657-2, NSSSS Functional Test – Channel ‘A’, Revision 7
 ST-6-043-320-2, Jet Pump Operability Verification for Two Recirculation Loop Operation, Revision 29
 S95.1.E, DC BOP Ground Fault System Routine Inspection and Operation, Revision 9
 ON-122, Loss of Main Control Room Annunciators, Revision 18
 RT-2-095-900-0, Location of Battery Grounds, Revision 19
 S95.9.G U/2, 125/250 VDC Balance of Plant Station Battery Ground Investigation, Revision 8
 M-095-006, Preventative Maintenance Procedure for Battery Chargers, Revision 4
 ST-4-095-964-2, Division II 2B2D103 Safeguard Battery Charger 24 Month Load Test, Revision 5
 ST-4-095-966-1, Division IV 1DD103 Safeguard Battery Charger 24 Month Load Test, Revision 4
 S95.2.A, Removing ‘A’ Station Battery Charger from Service, Revision 18
 E-1FD, Loss of Division IV Safeguard 125V DC Bus 1FD, Revision 10
 S95.9.A, Routine Inspection of Station Batteries and Chargers, Revision 15

Miscellaneous

Operability Evaluation OPE-13-002, Foreign Material in Control
 Rod Drives Caused Control Rods to Not Fully Insert During Scram 10 CFR Part 21
 ECR 10-00050, Desensitize Unit 2 Stop Valve Load Limit Logic
 PM 226024
 PEP I0005490
 LER 1-02-001, Unit 1 Inoperable Safeguard Battery Charger Resulted in a Condition Prohibited By Technical Specifications, 5/16/2002
 E-33, Single Line Meter & Relay Diagram 125/250VDC System 1 Unit, Revision 46

Section 1R18: Plant Modifications

Issue Reports

1475954	911901	1473450	917231	911901	1473456
1484029	544382	1403452			

Procedures

ST-2-001-800-2, Main Turbine Bypass System Response Test and SAA, Revision 9
 ST-6-001-660-2, Main Turbine CIV, Stop Valve RPS, and EOC-RPT Channel Functional Test, Revision 52
 ST-2-041-657-2, NSSSS Functional Test – Channel ‘A’, Revision 7
 S95.1.E, DC BOP Ground Fault System Routine Inspection and Operation, Revision 9
 ON-122, Loss of Main Control Room Annunciators, Revision 18
 RT-2-095-900-0, Location of Battery Grounds, Revision 19
 S95.9.G U/2, 125/250 VDC Balance of Plant Station Battery Ground Investigation, Revision 8
 ST-6-076-380-0, Secondary Containment 3 Zone Flow Balance Verification, Revision 9

Miscellaneous

M-002-I-0052, Sh. 1
 TRT No. 13-016, EHC Stop Valve Load Limit Logic Disable
 A1894795
 ECR 10-00050, Desensitize Unit 2 Stop Valve Load Limit Logic
 Maintenance Strategy: LG-0-076-I-T-PDT-076-004A (IQ Review 2/20/13)
 PM 221436 (R1098514)

Section 1R19: Post-Maintenance Testing**Issue Reports**

1471340	1161651	1467799	737238	147070	1478280
1484469	1475700	1476443	1476450	1018647	1159144

Procedures

MA-AA-716-060, Compression Fittings Inspection, Installation, Remake and Repair, Revision 2
 S12.1.A, Residual Heat Removal Service Water System Startup, Revision 51
 MA-AA-716-012, Post Maintenance Testing, Revision 17
 M-020-002, Fairbanks Morse Opposed Piston Diesel Engine Examination and General Maintenance, Revision 7
 ST-6- 012-231-0, 'A' Loop RHRSW Pump, Valve and Flow Test, Revision 64
 S92.9.N, Routine Inspection of the Diesel Generators, Revision 62
 ST-6-092-931-1, D11 Diesel Generator Governor Voltage Regulator Post Maintenance Testing, Revision 9
 ST-6-092-111-1, D11 Diesel Generator 24 Hr Endurance Test, Revision 30

Work Orders

C0246445 C0246481
 A1153342-01

Section 1R20: Refueling and Other Outage Activities**Issue Reports**

1492539	1495358	1495109	1496014	1478377	284148
643650	1199505	1494246	1478256		

Procedures

S.51.8.B, Shutdown Cooling – Reactor Core Coolant Circulation, Operation Startup, and Shutdown, Revision 74
 FH-105, Core Component Movement – Core Transfer, Revision 46
 2GP-6.1, Shutdown Operations – Refueling, Core Alteration and Core Off-Loading, Revision 30
 OU-AA-103, Shutdown Safety Management Program, Revision 12
 OU-LG-104, Limerick Generating Station Shutdown Safety Management Program, Revision 15
 OP-AA-108-117, Protected Equipment Program, Revision 3
 ON-121, Loss of Shutdown Cooling, Revision 29
 Limerick Generating Station 2R12 Shutdown Safety Plan 02/21/13
 SP-216, Replacement of 'A' Loop RHRSW Return Piping During 2R12, Revision 0
 RT-6-108-750-0, Operational Verification of Emergency AC/DC Lighting Transfer Switches, Revision 3
 RT-6-092-454-2, Procedure for De-energizing and Re-energizing the D24 Safeguard Bus during a Refuel Outage, Revision 12
 RT-6-108-300-2, Fire Safe Shutdown Emergency Lighting Unit (ELU) Operability Verification, Revision 19
 ER-AA-310, Implementation of the Maintenance Rule, Revision 8

Miscellaneous

Maintenance Strategy: LG-2-108-E-BT-20-EL-43, (IQ Review 4/1/13)
 E-1418, Fire Safe Shutdown Emergency Battery Pack Lighting Data Tabulation (Unit 1, 2 and Common), Sht. 1-10

Section 1R22: Surveillance TestingIssue Reports

1464601	1485199	1484761	1489213	1489186	1492602
1047618	1489176	1484718	1477164	1471008	1467773

Procedures

ER-AA-330-11, Snubber Service Life Monitoring, Revision 4
 M-200-053, Snubber Functional Test, Revision 1
 ER-AA-330-010, Snubber Functional Testing, Revision 4
 ST-1-103-990-2, Snubber Service Life Monitoring, Revision 5
 RT-6-031-750-2, EHC Accumulator Pressure Check, Revision 11
 ST-2-001-800-2, Main Turbine Bypass System Response Test and SAA, Revision 9
 ST-2-074-642-2, Source Range and Intermediate Range Neutron Monitor Pre-Shutdown Functional Test, Revision 6
 ST-6-107-595-2, Monthly Surveillance Log OPCON 1, 2 or 3, Revision 34
 ST-2-036-420-2, RPS-Electrical Power Monitoring Channel B and D Calibration Functional Test, Revision 15
 E-2BY160, Loss of 2B RPS UPS Power, Revision 15
 ARC-BOP-2AC514 D4, Generator Loss of Excitation, Revision 0
 ARC-BOP-1BC514 E4, Generator Over Excitation, Revision 0
 ST-6-092-312-2, D22 Diesel Generator Slow Start Operability Test Run, Revision 75
 ST-6-052-231-1, 'A' Core Spray Pump, Valve and Flow Test, Revision 75

Work Orders

R1192249
 R1194019
 PM 226024
 PEP I0005490

Miscellaneous

DBD L-S-07, Diesel Generator and Auxiliary Systems, Revision 14

Section 1EP4: Emergency Action Level and Emergency Plan ChangesProcedures

EP-AA-1000, "Standardized Radiological Emergency Plan," Revision 22 and 23
 EP-AA-1008, "Radiological Emergency Plan Annex for Limerick Generating Station," Revision 24 and 25

Section 2RS01: Access Control to Radiologically Significant AreasProcedures

RP-AA-460, Control for High and Locked High Radiation Areas, Revision 23
 RP-AA-460-001, Control for Very High Radiation Areas, Revision 4
 RP-AA-460-002, Additional High Radiation Area Exposure Control, Revision 1
 RP-LG-460-105, Drywell Entries at Power, Revision 9
 RP-LG-460-103, Upper Level Drywell Access Control during Irradiated Core Component Moves, Revision 14
 RP-AA-461, Radiological Control for Contaminated Water Diving Operations, Revision 3
 RP-AA-401-1002, Radiological Risk Management

RP-AA-403, Administration of the Radiation Work Permit Program, Revision 3
RP-AA-460-002, Additional High Radiation Exposure Control, Revision 1
RP-AA-4002, Radiation Protection Refuel Outage Readiness, Revision 8

Documents

Corrective Action Documents (ARs: 1324052, 1347476, 1324052)
10 CFR 61 Waste Stream Report - 2012
Dose Records
Contamination Control – Personnel Contamination Data
Dosimetry Performance Testing Data
Performance Indicator Summary Data

Section 2RS02: Occupational ALARA Planning and Controls

Procedures

RP-AA-400-1006, Outage Exposure Estimating and Tracking, Revision 3
RP-AA-401, Operational ALARA Planning, Revision 15
RP-AA-401-1002, Radiological Risk Management
RP-AA-403, Administration of the Radiation Work Permit Program, Revision 3
RP-AA-460-002, Additional High Radiation Exposure Control, Revision 1
RP-AA-4002, Radiation Protection Refuel Outage Readiness, Revision 8

Documents

Business Plan ALARA Goals
Station Daily Updates (various)
Three-year ALARA dose averages
2R11 Outage Report (Radiation Protection)
1R14 Outage Report (Radiation Protection)
Radiation Protection Outage Checklist
ALARA Contingency Plans
Source Term Control Plans and Actions
Radiological Risk Management Matrix
Station ALARA Committee Minutes
Various ALARA Plans
CRUD Burst Response Plan
Work-In-Progress Job Reviews and ALARA Reviews
Outage Report Data
Corrective Action Documents (ARs: 1332862, 1334532, 1334508, 1332749, and 1332834)

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

Procedures

RP-AA-870, Testing Portable High Efficiency Particulate Air Filter Units, Revision 3
Rp-AA-870-1001, Set-up and Operation of Portable Air Filtration Equipment, Revision 3
RP-AA-870-1002, Use of Vacuum Cleaners in Radiological Controlled Areas, Revision 15
RT-0-900-0, One-hour SCBA Cylinder Inspection and Functional Test, Revision 36, 38

Documents

SCBA parts list
SCBA inspection records (Pack 396, 199)
Air Quality Test Data

National Institute for Occupational Safety and Health Traceability for Scott SCBA Equipment
SCBA Respirator Qualification Records (training, medial certification)
Corrective Action Documents (various)
Airborne Radioactivity Intake Assessments

Section 2RS04: Occupational Dose Assessment

Procedures

RP-AA-203, Exposure Control and Authorization, Revision 3
Rp-AA-210, Dosimeter Issue, Usage, Control, Revision 22
RP-AA-215, Calculation and Crediting Dose from Noble Gas Exposure, Revision 0
RP-AA-220, Bioassay Program, Revision 8
RP-AA-220-1001, Collection and Handling of In-Vitro Bioassay Samples, Revision 0
RP-AA-222, Methods for Estimating Internal Exposure from In Vivo and
In Vitro Bioassay Data, Revision 3
RP-AA-350, Personnel Contamination Monitoring, Decontamination, and Reporting, Revision 10
RP-AA-350-1002, Managing Large Scale Contamination Events, Revision 0
RP-AA-605, Waste Stream Results Review, Revision 4

Documents

10 CFR 61 Reports
NVLAP testing Certification In-light
Exposure Control and Dose Records
General Source Term Data
Personnel Contamination Event Logs
Personnel Intake Investigations
Corrective Action Documents (various)

Section 2RS05: Radiation Monitoring Instrumentation

Procedures

CY-AA-130-3000, Gamma Isotopic Review, Revision 4
CY-AA-130-300, Gamma Spectroscopy, Revision 5

Documents

General Source Term Data

Section RS06: Radioactive Gaseous and Liquid Effluent Treatment

Procedures

ST-4-076-801, A SGTS Charcoal Analysis
ST-4-076-802, B SGTS Charcoal Analysis
ST-4-076-807-1, B Reactor Enclosure Recirculation System Charcoal Analysis
ST-4-076-806-1, A Reactor Enclosure Recirculation System Charcoal Analysis
ST-4-076-806-2, A Reactor Enclosure Recirculation System Charcoal Analysis
ST-4-076-807-2, B Reactor Enclosure Recirculation System Charcoal Analysis
ST-4-076-32 ½ A SGTS Charcoal Adsorber/High Efficiency Particulate Air Filter Test
ST-4-076-322-0, B SGTS Charcoal Adsorber/High Efficiency Particulate Air Filter test
ST-6-076-380-0, Secondary Containment Three Zone Flow Balance Verification
ST-4-076-321/2, Pressure Drop Test
ST-4-076-801/2, 720 Hour Test

ST-4-076-101, A SGTS Heater Test
 ST-6-076-310-1/2 SGTS Reactor Enclosure Secondary Containment Integrity test
 ST-2-072-106-2, Division I Reactor Enclosure BOP Isolation LF/SAA and RERS

Documents

Laboratory Test Data - Charcoal Adsorber test
 System Health Reporting, HVAC
 P&ID 8031-M-76-33, Reactor Enclosure and Refueling Area HVAC
 P&ID 8031-M-76-41, Reactor Enclosure and Refueling Area HVAC

Section 40A2: Problem Identification and Resolution

Issue Reports

1281903	1339603	1477197	1309210	1341696	1354075
1353319	1379535	1382731	1386254	1430903	1446985
1456406	1474963				

Procedures

OP-AA-102-103, "Operator Work-Around Program," Revision 3
 OP-AA-102-103-1001, "Operator Burden and Plant Significant Decision Impact Assessment Program," Revision 4
 ER-AA-2002, System Health Monitoring, Revision 15
 Operations PowerPoint Presentation – OWAs and Challenges, 2/19/13

Section 40A3: Followup of Events and Notices of Enforcement Discretion

Issue Reports

1473450	1456350	1473450	917231	911901	1473456
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Procedures

OT-102, Reactor High Pressure, Revision 0
 OT-104, Unexpected Unexplained Positive or Negative Reactivity Insertion, Revision 48
 S95.1.E, DC BOP Ground Fault System Routine Inspection and Operation, Revision 9
 ON-122, Loss of Main Control Room Annunciators, Revision 18
 RT-2-095-900-0, Location of Battery Grounds, Revision 19
 S95.9.G U/2, 125/250 VDC Balance of Plant Station Battery Ground Investigation, Revision 8

Miscellaneous

TRT No. 13-016, EHC Stop Valve Load Limit Logic Disable
 ECR 10-00050, Desensitize Unit 2 Stop Valve Load Limit Logic

Section 40A5: Other Activities

Issue Reports

1008718	1017190	1023602	1110739	1126917	1140346
1175003	1184333	1194319	1209845	1244984	1244984
1266938	1319816	1320066	1330965	1347476	1347829
1347829	1366280	1377128	1377559	1385003	1387851
1429761	1447280	1452199	1461065	1468807	1468808
1462289	574721	730021	1488314*		

Procedures

AD-LG-101-1005, "Preparation of Alarm Response Cards/Procedures," Revision 0
 ARC-MCR-107 A2, "Turbine Control Valve/Stop Valve Scram Bypassed," Revisions 3 and 4
 ARC-MCR-207 A2, "Turbine Control Valve/Stop Valve Scram Bypassed," Revisions 5 and 6
 EP-AA-1008, Limerick Generating Station EAL Hot Matrix," Revision 25
 HU-AA-104-101, "Procedure Use and Adherence," Revision 4
 LS-AA-1120, Exelon Reportability Manual - Event Rad 1.34," Revisions 14 and 15
 LS-AA-118-1002, "Exelon Nuclear Midcycle Assessments," Revision 1
 OP-AA-102-104, "Pertinent Information Program," Revision 2
 OP-AA-103-102, "Watch Standing Practices," Revision 11
 OP-AA-108-115, "Operability Determinations," Revision 11
 OP-LG-103-102, "Limerick Annunciator Response Card Use and Adherence," Revision 0
 TQ-AA-221, "Exelon Nuclear Training-Analysis Phase," Revision 4

Miscellaneous

05000353, LER 2008-002-00, "Automatic Actuation of the Reactor Protection System at Power"
 05000352, LER 2000-002-01, "Scram due to Generator Lockout following Failure of a Main Transformer Bushing Connection"
 05000352, LER 2012-004-00, "Common Cause Inoperability of Independent Channels
 05000353, LER 2011-003-00 and 01, "Condition Prohibited by Technical Specifications Due To Inoperable Reactor Core Isolation Cooling System"
 Check in Self Assessment (AR 1468807) dated 2/11/13, "3 Traditional Enforcement SL-IV Violations in One Year"
 Check in Self Assessment Notice of Violation for Failure to Immediately Reduce Reactor power per Alarm Response Procedure dated 2/11/13
 Check in Self Assessment Report Limerick Operations Dated 9/26/2012
 EA-12-190, "NRC Investigation Report No 1-2012-030," dated October 18, 2012
 Exelon Nuclear Licensed Operator Requalification Training Attendance Form for LGS Licensed Operator Requalification Training Cycle 1207 Classroom
 Exelon Reply to a Notice of Violation dated November 30, 2012
 Focus Area Self Assessment Limerick Operations- Operations Standards dated 8/30/12
 Focused Area Self Assessment Limerick Operations Configuration Control 10/3/11
 Letter to LGS Senior Reactor Operators from Operations Director, Subject: "SRO Responsibilities for Procedure Compliance"
 LGS Licensee Operator Requalification Training Guide LLOR1205O, "Operations Leadership- Performance Review" dated 8/31/12
 Licensee Operator Requalification Training Simulator Exercise Guide LLORSEG-9050 dated 11/16/12
 Limerick Control Room Operator Logs dated 7/11/12 to 7/12/12
 Limerick Radiation Protection Survey Map 12-01030, "Unit 1 Reactor Bldg EL 283' RWCU TNK RM dated 2/11/12
 Limerick Radiation Protection Survey Map 12-04016, "Unit 1 Reactor Bldg EL 283' RWCU TNK RM dated 3/27/12
 Limerick Radiation Protection Survey Map 13-00620, "Unit1 Rx 283' EL" dated 1/29/13
 Limerick Technical Specification 3.4.3, "Instrumentation"
 Nuclear Energy Institute 07-07, "Industry Ground Water Protection Initiative (August 2007)
 NOSA-LIM-11-08, "Limerick NOS Quality Assurance Program Audit." dated November 2, 2011
 NOS-LG-13-08, "Limerick NRC IP 92723 Inspection Readiness" Dated 2/21/13
 NRC Inspection Manual Part 9900 Technical Guidance, "Operability Determinations & Functionality Assessments for Resolution of Degraded or Nonconforming Conditions Adverse to Quality or Safety"

NRC IR 05000352 and 353/2011005
 NRC IR 05000352 and 353/2011503
 NRC IR 05000352 and 353/2012002
 NRC IR 05000352 and 353/2012003
 NRC IR 05000352 and 353/2012004
 NRC IR 05000352 and 353/2012005
 NRC IR 05000352 and 353/2012008
 OE13431 -“The Operability Determination Process Failed to Identify All Operability Concerns.”
 OE13598 - “Delayed Recognition of Inoperable Control Room Envelop Ventilation”
 OE18141-“Control Room Offices Ventilation was Improperly Placed in Service with Control Room Ventilation in Make Up Mode
 OE28619 -“Misapplication of the guidance in NRC Administrative Letter 98-10 in the Operability Determination Process”
 OE34479-“Declining Trend in Operability Determinations Led to Inadequate Evaluations”
 OE35184 -“Non-Cited Violation Due to Not Considering the Affect of Main Steam Safety/Relief Valve Seat Leakage on Component Operability
 OE35269 -“Potential Nuclear Regulatory Commission Violation For an Inadequate Operability Determination”
 OE35328-“Unplanned Downpower Due to Stator Cooling Alarm”
 OE36083 -“Conservative Assumptions in Decision Making Substantive Cross Cutting Issue.”
 Operations Standing Order 12-08, “ARC Usage Requirements,” dated 10-22-12
 Operations Standing Order 12-09, “Immediate Operability Determinations,” dated 10-23-12
 Reactor Plant Event Notification Worksheet for EN #47823 dated 3/9/12
 RS-12-105 - Letter to K. Masa from R. Coon dated June 29, 2012 Subject “SOER 10-02, Engaged, Thinking Organizations – Recommendations 2 and 3”
 Commitment T04263, Station Procedures for Maintenance on Main Transformer
 Limerick Generating Station, Units 1 and 2 - Audit of the Licensee’s Management of Regulatory Commitments

Section 40A7: Licensee-Identified Violations

Issue Reports

1492602	1047618	1478866	1483039	1282352	1186147
278169	1038160	1341823	1346309	1490073	1491229
1491256					

Procedures

ST-2-001-800-2, Main Turbine Bypass System Response Test and SAA, Revision 9
 M-200-002, 2.3 kv and 4kv Power Circuit Breaker Overhaul, Revision 7
 RT-6-031-750-2, EHC Accumulator Pressure Check, Revision 11
 ST-2-036-420-2, RPS Electrical Power Monitoring Channel B/D/ Cal Functional Test, Revision 15
 ST-6-001-761-2, Main Turbine Bypass Valve Exercising, Revision 20
 IC-11-00497, Alignment of the EHC System of the GE Turbine Generator, Revision 19
 ER-AA-520, Instrument Performance Trending, Revision 0
 ST-6-049-231-2, RCIC Pump Comprehensive Test, Revision 2
 RT-6-095-920-0, TSC UPS Battery Quarterly Check, Revision 14
 ST-6-049-230-2, RCIC Pump, Valve and Flow Test, Revision 72
 M-095-002, 250 VDC Westinghouse Magnetic Starter Maintenance, Revision 5
 ST-6-095-450-0, Div I-IV 125/250 VDC Safeguard Power Distribution Alignment and Voltage Check, Revision 14

ER-AA-321-1007, In-service Testing (IST) Program – Corporate Technical Position, Revision 1
CTP-IST-001, Preconditioning of IST Program Components, Revision 1

Miscellaneous

R1192249
R1194019
R0993594
PM 385032
PM 385033

LIST OF ACRONYMS

ACE	Apparent Cause Evaluation
ADAMS	Agency wide Documents Access and Management System
ALARA	As Low As is Reasonably Achievable
CAP	Corrective Action Plan
CFR	Code of Federal Regulations
DC	Direct Current
EDG	Emergency Diesel Generator
ESW	Emergency Service Water
HPCI	High Pressure Coolant Injection
IMC	Inspection Manual Chapter
IR	Issue Report
LER	Licensee Event Report
NCV	Non-Cited Violation
NRC	Nuclear Regulatory Commission
NUREG	NRC Technical Report Designation
NVLAP	National Laboratory Accreditation Program
PI	Performance Indicators
PM	Preventive Maintenance
RCIC	Reactor Core Isolation Coolant
RHRSW	Residual Heat Removal Service Water
SCBA	Self-Contained Breathing Apparatus
SL	Severity Level
SSC	Structure, System, or Component
ST	Surveillance Test
TS	Technical Specifications
UFSAR	Updated Final Safety Analysis Report