



UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION I
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January 20, 2012

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

SUBJECT: LIMERICK GENERATING STATION – NRC INTEGRATED INSPECTION
REPORT 05000352/2011005 AND 05000353/2011005

Dear Mr. Pacilio:

On December 31, 2011, 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 January 13, 2012, with Mr. W. Maguire, 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). This finding was determined to involve a violation of NRC requirements. However, because of the very low safety significance, and because it is entered into your corrective action program, the NRC is treating this finding as a non-cited violation (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.

In accordance with 10 CFR 2.390 of the NRC's "Rules of Practice," a copy of this letter, its enclosure, and your response (if any) will be available electronically for public inspection in the NRC Public Document Room or from the Publicly Available Records component of the NRC's

document system (ADAMS). ADAMS is accessible from the NRC website at <http://www.nrc.gov/reading-rm/adams.html> (the Public Electronic Reading Room).

Sincerely,



Paul G. Krohn, Chief
Reactor Projects Branch 4
Division of Reactor Projects

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

Enclosure: Inspection Report 05000352/2011005 and 05000353/2011005
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Sincerely,

/RA/

Paul G. Krohn, Chief
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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.: 05000352/2011005 and 05000353/2011005

Licensee: Exelon Generation Company, LLC

Facility: Limerick Generating Station, Units 1 & 2

Location: Sanatoga, PA 19464

Dates: October 1, 2011 through December 31, 2011

Inspectors: E. DiPaolo, Senior Resident Inspector
N. Sieller, Resident Inspector
J. Ambrosini, Acting Senior Resident Inspector
J. Richmond, Senior Reactor Inspector
J. Tomlinson, Operations Engineer
S. Ibarrola, Project Engineer
J. Lilliendahl, Reactor Inspector
T. Moslak, Health Physicist
E. Miller, Project Engineer

Approved By: Paul G. Krohn, Chief
Reactor Projects Branch 4
Division of Reactor Projects

Enclosure

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SUMMARY OF FINDINGS

IR 05000352/2011005, 05000353/2011005; 10/01/2011-12/31/2011; Limerick Generating Station, Units 1 and 2; Post Maintenance Testing.

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

Cornerstone: Mitigating Systems

- Green. The inspectors identified a Green NCV of 10 CFR Part 50, Appendix B, Criterion XVI, "Corrective Action," for failure to implement adequate corrective actions for a previous NRC-identified finding. The previous finding involved a failure to perform adequate preventive maintenance (PM) on an emergency diesel generator (EDG) due to site engineers not being fully aware of new PM requirements developed by Exelon corporate. The lack of proper PM led to a failure of an EDG in May 2010. In response to the previous finding, Limerick performed an apparent cause evaluation (ACE) and developed actions to address the causes and extent of condition. However, the inspectors identified that the actions were not properly implemented, and, as a result, the deficiency identified by the inspectors was not fully resolved. Exelon entered the issue in the Corrective Action Program (CAP) for resolution.

The inspectors determined that the failure to implement adequate corrective actions for a previous NRC-identified finding was a performance deficiency. The issue is more than minor because, if left uncorrected, it could become a more significant safety concern. Specifically, the issues identified by the inspectors impacted Limerick's ability to establish and implement appropriate PM for equipment relied on for safe operation of the plant. Until the issues are fully resolved, Limerick continues to be vulnerable to gaps in their PM program. This issue affects all sites in the Exelon fleet. The finding was determined to be of very low safety significance (Green) using Attachment 4 to IMC 0609, "Significance Determination Process," because the incomplete corrective actions did not result in an actual loss of safety function.

This finding has a cross-cutting aspect in the area of Problem Identification and Resolution, Corrective Action Program, because Exelon failed to implement appropriate corrective actions for a previous NRC-identified finding in timely manner. [P.1(d)] (Section 1R19)

Other Findings

None.

REPORT DETAILS

Summary of Plant Status

Unit 1 began the inspection period at 100 percent power. On October 15, operators reduced power to approximately 90 percent for a control rod pattern adjustment. The plant was returned to 100 percent power on October 16. On November 12, operators again reduced power to 90 percent for a rod pattern adjustment. The unit was returned to 100 percent power on November 13. On December 10, operators reduced power to approximately 80 percent to facilitate main turbine valve testing, control rod channel distortion testing, and to perform a control rod pattern adjustment. Operators returned the unit to full power on December 12. Operators commenced a planned shutdown on December 17 for Maintenance Outage 1M47 to replace the 'D' safety/relief valve which exhibited degrading first stage pilot valve leakage. Operational Condition (OPCON) 4 (Cold Shutdown) was achieved on December 18. On December 20, the 'B' recirculation pump motor-generator motor faulted during startup of the 'B' recirculation pump in preparations for a reactor startup. Following replacement of the motor, a reactor startup was commenced on December 26. The unit returned to 100 percent power on December 31. Unit 1 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 December 23, operators reduced power to approximately 92 percent to facilitate main turbine valve testing, secondary plant planned maintenance, and control rod hydraulic control unit maintenance. Operators returned the unit to 100 percent power on December 24, and the unit remained at or near 100 percent power for the remainder of the inspection period.

1. REACTOR SAFETY

Cornerstones: Initiating Events, Mitigating Systems, and Barrier Integrity

1R01 Adverse Weather Protection (71111.01 – 1 sample)

Readiness for Seasonal Extreme Weather Conditions

a. Inspection Scope

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

b. Findings

No findings were identified.

1R04 Equipment Alignment

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

a. Inspection Scope

The inspectors performed partial walkdowns of the following systems:

- Emergency Diesel Generator (EDG) D24 on October 19 during the overhaul of EDG D21
- Unit 2 reactor core isolation cooling (RCIC) system when the high pressure coolant injection (HPCI) system was out-of-service on December 21
- Offsite Power Source and 4 Kilo-Volt Safeguard alignment during EDG D14 testing on December 29

The inspectors selected these systems based on their risk-significance relative to the reactor safety cornerstones at the time they were inspected. The inspectors reviewed applicable operating procedures, system diagrams, the UFSAR, technical specifications, work orders, condition reports, and the impact of ongoing work activities on redundant trains of equipment in order to identify conditions that could have impacted 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 corrective action program for resolution with the appropriate significance characterization.

b. Findings

No findings were identified.

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

a. Inspection Scope

On October 24 and 25, 2011, the inspectors performed a complete system walkdown of accessible portions of the common unit ESW system to verify the existing equipment lineup was correct. The inspectors reviewed applicable operating procedures, system diagrams, the UFSAR, technical specifications, work orders, condition reports, and the impact of ongoing work activities on redundant trains of equipment. 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 issue reports (IRs) and work orders to ensure Exelon appropriately evaluated and resolved any deficiencies.

b. Findings

No findings were identified.

1R05 Fire Protection

Resident Inspector Quarterly Walkdowns (71111.05Q – 3 samples)

a. Inspection Scope

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

- Fire Area 5, F-A-360, Unit 2 Class 1E Battery Room
- Fire Area 30, F-R-400, Unit 1 Drywell
- Fire Area 85, F-D-315B, D22 Diesel Generator Room

b. Findings

No findings were identified.

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

a. Inspection Scope

The inspectors reviewed the Unit 1 'F' Residual Heat Removal (RHR) room unit cooler to determine its readiness and availability to perform its safety function. 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 inspections and tests of the unit cooler, and verified that Exelon initiated appropriate corrective actions for identified deficiencies. 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 Requalification

.1 Quarterly Review of Licensed Operator Requalification Testing and Training (71111.11Q – 1 sample)

a. Inspection Scope

The inspectors observed licensed operator simulator training scenarios on November 22 which included inadvertent containment isolations, equipment failures requiring a rapid plant shutdown, failure of the reactor protection system, and failures of emergency core cooling systems. The inspectors evaluated operator performance during the simulated event and verified completion of risk significant operator actions, including the use of abnormal and emergency operating procedures. The inspectors assessed the clarity and effectiveness of communications, implementation of actions in response to alarms and degrading plant conditions, and the oversight and direction provided by the control room supervisor. The inspectors verified the accuracy and timeliness of the emergency classification made by the shift manager and the technical specification action statements entered. 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 Annual Operator Requalification Program Review (71111.11A – 1 sample)

a. Inspection Scope

On November 14, one NRC region-based inspector conducted an in-office review of results of licensee-administered annual operating tests and comprehensive written exams for 2011. The inspection assessed whether pass rates were consistent with the guidance of NRC Manual Chapter 0609, Appendix I, "Operator Requalification Human Performance SDP." The inspectors verified that:

- Crew pass rates were greater than 80 percent (Pass rate was 100 percent)
- Individual pass rates on the written exam were greater than 80 percent (Pass rate was 92 percent)
- Individual pass rates on the job performance measures of the operating exam were greater than 80 percent (Pass rate was 100 percent)
- More than 75 percent of the individuals passed all portions of the exam (92 percent of the individuals passed all portions of the examination)
- Individual pass rates on the dynamic simulator test were greater than 80 percent (Pass rate was 100 percent)
- Overall pass rate among individuals for all portions of the exam was greater than or equal to 75 percent (Overall pass rate was 92 percent)

b. Findings

No findings were identified.

.3 Annual Limited Operator Requalification Program Review (71111.11A – 1 sample)

a. Inspection Scope

On December 21, one NRC region-based inspector conducted an in-office review of results of licensee-administered annual operating tests and comprehensive written exams for Limerick and Peach Bottom Limited Senior Reactor Operators for 2011. The inspection assessed whether pass rates were consistent with the guidance of NRC Manual Chapter 0609, Appendix I, "Operator Requalification Human Performance SDP." The inspector verified that:

- Individual pass rates on the written exam were greater than 80 percent (Pass rate was 100 percent)
- Individual pass rates on the job performance measures of the operating exam were greater than 80 percent (Pass rate was 91 percent)
- More than 75 percent of the individuals passed all portions of the exam (100 percent of the individuals passed all portions of the examination)
- Overall pass rate among individuals for all portions of the exam was greater than or equal to 75 percent (Overall pass rate was 91 percent)

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 structures, systems, and components (SSCs) performance and reliability. The inspectors reviewed system health reports, corrective action program documents, maintenance work orders, and maintenance rule basis documents to ensure that Exelon was identifying and properly evaluating performance problems within the scope of the maintenance rule. For each sample selected, the inspectors verified that the SSC was properly scoped into the maintenance rule in accordance with 10 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 staff was identifying and addressing common cause failures that occurred within and across maintenance rule system boundaries.

- IR 1191498, Unit 1 Main turbine stop valve #3 failed to close from main control room during testing
- IR 1231487, Unit 1 HPCI control valve failure
- IR 1275643, Standby gas treatment system relay surveillance test failure

b. Findings

No findings were identified.

1R13 Maintenance Risk Assessments and Emergent Work Control (71111.13 – 5 samples)

a. Inspection Scope

The inspectors reviewed station evaluation and management of plant risk for the maintenance and emergent work activities listed below to verify that Exelon performed the appropriate risk assessments prior to removing equipment for work. The inspectors selected these activities based on potential risk significance relative to the reactor safety cornerstones. As applicable for each activity, the inspectors verified that Exelon personnel performed risk assessments as required by 10 CFR 60.65(a)(4) and that the assessments were accurate and complete. When Exelon performed emergent work, the inspectors verified that operations personnel promptly assessed and managed plant risk. The inspectors reviewed the scope of maintenance work and discussed the results of the assessment with the station's probabilistic risk analyst to verify plant conditions were consistent with the risk assessment. The inspectors also reviewed the technical specification requirements and inspected portions of redundant safety systems, when applicable, to verify risk analysis assumptions were valid and applicable requirements were met.

- Yellow risk on Unit 1 due to 'A' reactor enclosure recirculation system and standby gas treatment system surveillance testing with both Unit 1 HPCI room coolers out-of-service for ESW valve work on October 11
- Green risk on Unit 1 while both 'D' core spray pump unit coolers were out-of-service on October 12
- Yellow risk on Unit 1 while the HPCI system was out-of-service for governor tuning and the 'A' standby gas treatment system was out-of-service during an extended system outage window on October 24
- Emergent maintenance on the 3rd offsite power source on November 8 due to a switch yard bushing failure
- Yellow risk on Unit 2 while HPCI was out-of-service for planned maintenance and Unit 1 was operating shutdown cooling in a maintenance outage on December 21

b. Findings

No findings were identified.

1R15 Operability Determinations and Functionality Assessments (71111.15 – 5 samples)

a. Inspection Scope

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

- IR 1140215, Unexpected shift in 'B' loop ESW flow
- IR 1280748, EDG D24 frequency oscillations during load reject testing
- IR 1282425, Unit 2 feedwater leading edge flow meter indicated less flow than other plant parameters during surveillance testing
- IR 1292570, Reduced RHR SW and ESW flow discovered during ESW flow balance testing
- IR 1294806, Motor-driven fire pump automatic start due to suspected fire system leak

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 Exelon's 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 by Exelon. The inspectors determined, where appropriate, compliance with bounding limitations associated with the evaluations.

b. Findings

No findings were identified.

1R19 Post-Maintenance Testing (71111.19 – 10 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.

- C0238106, Standby gas treatment system charcoal filter outlet isolation valve (HV-076-012A-OP) Oil Change and Pressure Switch Calibration
- C0239796, Replace Unit 1 main steam safety/relief valve PSV-041-1F013D
- C0240449, Replace D22 EDG LSA relay
- C0240530, Replace battery cells 36 and 45 for 2D battery
- IR 1275643, Unexpected results during standby gas treatment system ST-2-072-107-0
- R 0859511, Replace Unit 2 'A' reactor enclosure recirculation system damper (HV-076-252-OP) solenoid valve
- R 1144306, D21 EDG 24-month overhaul
- R 1150960, Clean and examine residual heat removal unit cooler 1F-V210
- R 1170641, Inspect/Rework 'D' core spray pump room unit cooler supply valve
- R1187754, Rebuild control rod drive hydraulic control unit waterside components for control rod 02-23

b. Findings

Introduction. The inspectors identified a Green NCV of 10 CFR Part 50, Appendix B, Criterion XVI, "Corrective Action," for failure to implement adequate corrective actions for a previous NRC-identified finding. The previous finding involved a failure to perform adequate PM on an EDG due to site engineers not being fully aware of new PM requirements developed by Exelon corporate engineers. The lack of proper PM led to a

failure of an EDG in May 2010. In response to the previous finding, Limerick performed an ACE and developed actions to address the causes and extent of condition. However, the inspectors identified that the actions were not properly implemented by Exelon, and, as a result, the deficiency identified by the inspectors was not fully resolved.

Description. In November 2010, the NRC issued NCV 05000352, 353/2010004-03 to Limerick following a catastrophic failure of the D23 EDG. Limerick's investigation had attributed the diesel failure to degraded operation of the lube oil filter bypass valves, and had identified that the station was not conducting thorough inspections of the valves as required by Exelon's Performance Centered Maintenance (PCM) template for the diesel.

The NRC inspectors followed-up by questioning why the inspections were not being performed, and discovered that the site engineers had never been informed of the inspection requirement when it was added to the template. Exelon corporate engineers had added the detailed inspection guidance to the basis section of the PCM template, but relied on an internet tool to communicate the change to the site engineers. The internet tool compared new template revisions to former ones, and highlighted any PM tasks that had changed. The inspectors identified that the tool only highlighted tasks whose titles or frequencies had been revised; it did not highlight tasks if only the basis had changed. The inspectors determined that Exelon's flawed internet tool had resulted in Limerick site engineers not being fully informed of the new inspection guidance added to the basis of the PCM template. As a result, they did not implement new PM guidance for the lube oil bypass valve inspection, and did not prevent the D23 EDG failure in May 2010. The inspectors documented a Green NRC-identified NCV for Exelon's failure to provide an adequate procedure for PM of the Limerick EDG lube oil filter bypass valves.

In response to the NRC finding, Limerick wrote IR 1114118 and performed an ACE to determine why the PCM template revision had not been fully implemented at Limerick. The ACE confirmed the inspectors' observations, concluding that "the tool used by site engineering to identify changes in a new revision of a PCM template did not highlight changes to the basis for a PM task." The ACE also identified that the tool did not highlight changes made to the notes section or the comments section of a PCM template. Because the issue affected all sites in the fleet, Exelon corporate engineering generated IR 1126485 to evaluate the PCM template process and establish appropriate corrective actions.

The inspectors' review of IRs 1114118 and 1126485 determined that Exelon did not implement adequate corrective actions to address PCM template process weaknesses. Specifically, two of the six actions listed in the ACE were not implemented as intended:

1. Corrective Action 1126485-02 was to revise MA-AA-716-210, "Performance Centered Maintenance Process," to explicitly require that changes to a PCM template be summarized in a revision summary note so that the changes are clearly communicated. When Exelon corporate implemented this action, they added the following step to the procedure: "4.14.8. PROVIDE a summary of all changes to the Task, Frequency and Basis associated with the revision." The inspectors noted that this step did not require the summary to include changes to the notes or comments section of the PCM template, although Limerick's ACE identified that the notes and comments sections were also not being highlighted by the online tool.

2. Assignment 1126485-03 was for Exelon corporate to review the changes made since the implementation of each PCM template and identify any changes that may require further evaluation by the sites to verify they were properly implemented. (The review was intended to focus on changes made to the basis, notes, and comments sections, and to address the other potential vulnerabilities.) This assignment was closed on September 2, 2011, without the required review being conducted. Exelon reviewed only the templates that were recently revised and in the process of implementation, although they were tasked with looking back at all PCM templates.

On October 31, 2011, during performance of a surveillance test (ST), the D22 EDG failed to swap from isochronous to droop mode. The licensee determined that contacts on the relay that controls this function (LSA) had failed to reposition, which meant that control of the engine could not be transferred to the main control room. D22 was declared inoperable, and a prompt investigation was performed. The investigation stated that the LSA relay had been installed since 1995, despite a note in the PCM template indicating the LSA relay should be replaced every 10 years at Limerick. The inspectors discovered that the note was not included in the original version of the PCM template, but was added in July 2006. The inspectors observed that this issue appeared very similar to the D23 EDG finding from May 2010. If Exelon had conducted a thorough extent of condition review under assignment 1126485-03, the fact that there was no 10 year replacement PM in place for the relay should have been identified.

Limerick wrote a new IR (IR 1312492) to document the inspectors' concerns. Exelon plans to implement a new internet tool for PCM templates, which will allow engineers to do a more thorough comparison of new template revisions to former ones. The new tool will capture changes to all fields, including the basis, notes, and comments. Exelon also plans to perform a thorough extent of condition review to identify all instances of technical information contained in basis, note, or comment fields, and ensure the information has been properly evaluated and implemented.

Analysis. The inspectors determined that Exelon's failure to take adequate corrective actions for a previous NRC-identified NCV was a performance deficiency. The finding was more than minor because, if left uncorrected, it could become a more significant safety concern. Specifically, the issues identified by the inspectors impacted Limerick's ability to establish and implement appropriate PM for equipment relied on for safe operation of the plant. Until the issues are fully resolved, Limerick continues to be vulnerable to gaps in their PM program. This issue affects all sites in the Exelon fleet, since the PCM template process is common to all plants. This finding affected the Mitigating Systems cornerstone and was evaluated using Phase 1, "Initial Screening and Characterization" worksheet in Attachment 4 to IMC 0609, "Significance Determination Process." The inspectors determined this finding was of very low safety significance (Green) because the incomplete corrective actions from the ACE under IR 1114118 did not result in an actual loss of safety function of a component, train, or system, and was not potentially risk-significant due to a seismic, fire, flooding, or severe weather initiating event.

This finding has a cross-cutting aspect in the area of Problem Identification and Resolution, Corrective Action Program, because Exelon failed to implement appropriate corrective actions for a previous NRC-identified finding in timely manner. [P.1(d)]

Enforcement. 10 CFR Part 50, Appendix B, Criterion XVI, "Corrective Action," requires, in part, that measures shall be established to assure that conditions adverse to quality are promptly identified and corrected. Contrary to the above, Exelon failed to take adequate actions in response to a previous NRC-identified finding. Specifically, in November 2010, Exelon received a Green, NRC-identified NCV for failing to provide an adequate procedure for PM of the Limerick EDG lube oil filter bypass valves. (NCV 05000352, 353/2010004-03). Exelon performed an ACE under IR 1114118 and developed several actions to address the causes and extent of condition. The inspectors identified that two of the actions were not completed as intended, which resulted in the deficiency identified by the inspectors not being fully resolved and failure of the D22 EDG during a surveillance test on October 31, 2011. Because the issue is of very low safety significance (Green), and Exelon entered this issue into their CAP as IR 1312492, this finding is being treated as an NCV consistent with the NRC Enforcement Policy. **(NCV 05000352, 353/2011005-01, Inadequate Corrective Actions for a Previous NRC Finding for Programmatic Deficiencies in the Preventive Maintenance Program)**

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

a. Inspection Scope

The inspectors reviewed the station's work schedule and outage risk plan for the Unit 1 maintenance outage (1M47) which was conducted December 18, 2011 through December 27, 2011. The main purpose for the planned outage was to replace the 'D' safety/relief valve which exhibited degrading first stage pilot valve leakage. In addition, the 'B' recirculation pump motor-generator motor was replaced due to an emergent failure. The inspectors reviewed Exelon's development and implementation of outage plans and schedules to verify that risk, industry experience, previous site-specific problems, and defense-in-depth were considered. During the outage, the inspectors observed portions of the shutdown and cool down 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
- Configuration of reactor coolant pressure, level, and temperature instruments to provide accurate indication and instrument error accounting
- Status and configuration of electrical systems and switchyard activities to ensure that technical specifications were met
- Monitoring of decay heat removal operations
- Reactor water inventory controls, including flow paths, configurations, alternative means for inventory additions, and controls to prevent inventory loss
- Activities that could affect reactivity
- Maintenance of secondary containment as required by technical specifications
- Fatigue management
- Identification and resolution of problems related to outage activities

b. Findings

No findings were identified.

1R22 Surveillance Testing (71111.22 – 6 samples)

a. Inspection Scope

The inspectors observed performance of surveillance tests (STs) 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:

- RT-2-011-252-0, ESW Loop 'B' Flow Balance
- RT-3-047-640-1, Fuel Channel Distortion Monitoring
- RT-6-051-702-1, Unit 1 'B' Residual Heat Removal Loop Contaminated Piping Inspection
- ST-6-092-316-2, D22 Diesel Generator Fast Start Operability Test Run
- ST-6-051-235-1, Unit 1 'B' Residual Heat Removal Pump Comprehensive Test (IST)
- RT-6-041-490-1, Suppression Pool Gross Input Leak Rate Determination (reactor coolant system (RCS) leak rate surveillance)

b. Findings

No findings were identified.

2. RADIATION SAFETY

Cornerstones: Occupational and Public Radiation Safety

2RS5 Radiation Monitoring Instrumentation (71124.05 – 1 sample)

a. Inspection Scope

During the period of December 12 – 16, the inspectors conducted the following activities to evaluate the operability and accuracy of radiation monitoring instrumentation used to ensure a safe work environment, and to detect and quantify radioactive process streams and effluent releases. Implementation of these programs was reviewed against the criteria contained in 10 CFR Part 20, applicable industry standards, and Exelon's procedures.

Walkdown of Process and Effluent Monitoring Systems

The inspectors walked down selected portions of the liquid and gaseous monitoring systems installed in Unit 1 and Unit 2 to assess material condition and the status of

system upgrades. The walkdown included the Unit 1 and Unit 2 South Stack gaseous effluent monitors and the site liquid radwaste monitor.

Calibration of Portable Survey Instruments, Contamination Monitors, Electronic Dosimeters, and Air Samplers

The inspectors reviewed the operating procedure, calibration reports and current source activities/dose rate characterizations for the Shepherd Model 89 box calibrators (Nos. 8271 and 8268), and the dosimeter calibrator (Model 423) used for calibrating survey instruments and electronic dosimeters, respectively.

The inspectors reviewed the operating procedures and calibration records for selected survey meters, electronic dosimeters, and contamination monitors including small article monitors (9), personal contamination monitors (ARGOS 5A/B & PM-7), airborne contamination monitors (AMS-4), and portable instruments (RO-2, RO-2A, RSO-50E, Telepole, ASP-1/NRD). For these instruments, the inspectors observed technicians perform daily operational source checks. The inspectors confirmed that procedural requirements were met and that the instruments had the required accuracy.

During walkdowns in various plant areas, the inspectors confirmed that available monitoring instruments were calibrated, that daily source checks had been performed, and that the instruments were operational. Instruments checked included handheld survey instruments, electronic dosimeters, air monitors, and contamination monitors.

The inspectors reviewed contamination sampling results (10 CFR Part 61 radionuclide analyses) used to characterize difficult-to-measure radioisotopes, to determine if the calibration sources were representative of the radioisotopes found in the plant's source term. Whole body counting system records and contamination monitor setpoints were reviewed to determine if source term data was incorporated in system setup to ensure that relevant radioisotopes were accounted for when making measurements.

Laboratory Instrumentation

The inspectors reviewed the calibration records, daily source checks and maintenance records for selected gamma spectroscopy systems (Detectors Nos. 1, 2, 3, and 4) and a beta scintillation counter (Packard TriCarb 2900TR) to verify that the instruments were calibrated and properly maintained. The inspectors confirmed that the check sources used aligned with the plant's isotopic mix and the instruments met the operability acceptance criteria.

Whole Body Counters

The inspectors reviewed the calibration and operating procedure for the FastScan and AccuScan whole body counting systems. The inspectors determined that appropriate radioactive source phantoms were used in making calibrations and that calibration sources were representative of radioisotopes found in the plants' source term.

Plant Process and Post-Accident Monitoring Instrumentation

The inspectors reviewed the calibration/functional test records for various areas, liquid and gaseous effluent instruments installed in Unit 1 and Unit 2. Records reviewed

included the drywell high range radiation monitors, liquid radwaste discharge monitor, plant vent wide range monitors, north and south stack effluent monitors, and hot maintenance shop exhaust radiation monitors. The inspectors reviewed electronic and radiation source calibrations to determine whether they were appropriately conducted and that the alert and high alarm set points were properly established.

Problem Identification and Resolution

The inspectors reviewed selected IRs, system health reports, self-assessments, and various Nuclear Oversight reports to evaluate Exelon's threshold for identifying, evaluating, and resolving problems for the radiation monitoring instrumentation. Included in this review were IRs related to radiation worker and radiation protection technician errors to determine if an observable pattern traceable in the maintenance or use of radiation instruments was evident.

b. Findings

No findings were identified.

Cornerstone: Public Radiation Safety

2PS1 Radioactive Gaseous and Liquid Effluent Treatment (71124.06 - 1 sample)

a. Inspection Scope

During the period of November 14 - 17, the inspectors conducted the following activities to verify Exelon was properly maintaining the gaseous and liquid effluent processing systems to ensure that radiological releases were properly mitigated, monitored, and evaluated with respect to public exposure. Implementation of these controls was reviewed against the criteria contained in 10 CFR Parts 20 and 50, the licensee's Offsite Dose Calculation Manual (ODCM), and Exelon's procedures.

Effluent Reports, ODCM and UFSAR Reviews

The inspectors reviewed the 2009 and 2010 Annual Radiological Effluent Release Reports (Nos. 35 and 36) to verify that the results of the effluents program were reported as required by the ODCM.

The inspectors reviewed the changes made to the ODCM, Revision 25, in 2010 to determine if the changes were technically justified and affected Exelon's ability to maintain effluent releases as low as is reasonably achievable.

The inspectors reviewed the current revision of the site UFSAR to determine if effluent treatment and monitoring systems had been reconfigured or modified.

Walkdown and Observations

The inspectors examined portions of the Unit 1 and Unit 2 gaseous and liquid release monitoring systems to evaluate equipment material condition and system configurations. The inspectors reviewed the most current system health reports for the process radiation monitoring systems and discussed the system status with the cognizant system

engineer. The inspectors also reviewed the completed ST procedures associated with selected monitors that demonstrated instrument functionality. STs reviewed included:

Unit 1:

ST-2-026-400-1, South Stack Radiation Monitor, Unit 1 A
 ST-2-026-401-1, South Stack Radiation Monitor, Unit 1 B
 ST-2-026-442-1, South Stack Flow Rate Monitor Cal/Functional Test

Unit 2:

ST-1-026-400-2, South Stack Radiation Monitor, Unit 2 A
 ST-2-026-401-2, South Stack Radiation Monitor, Unit 2 B
 ST-2-026-442-2, South Stack Flow Rate Monitor Cal/Functional Test

Unit 1 & 2:

ST-2-026-414/415-0, North Stack Radiation Monitor Cal/Functional Test A/B
 ST-2-026-440-0, North Stack Flow Rate Monitor Cal/Functional Test
 ST-2-026-438-0, Wide Range North Stack Monitor Cal/Functional Test
 ST-2-063-400-0, Liquid Effluent Radiation Monitor Cal Functional Test
 ST-2-063-600-0, Liquid Effluent Radiation Monitor Quarterly Functional Test
 ST-2-063-601-0, Liquid Effluent Radiation Monitor Cal/Functional Test
 ST-2-063-602-0, Liquid Effluent Flow Rate Monitor Cal/Functional Test

The inspectors reviewed the most current liquid and gaseous effluent monitor functional test results and calibration records to verify that the associated isolation functions and alarms were operable. The inspectors evaluated the effluent radiation monitor set points for agreement with the ODCM requirements.

Sampling and Analysis

The inspectors reviewed the relevant ST procedures (ST-5-076-815-0/1/2) and associated sampling procedure (CY-LG-170-202) and observed a technician collecting weekly air particulate filter and iodine cartridge samples from the Hot Maintenance Shop, the North Stack monitors, the South Stack monitors, and the Wide Range Gas Monitor.

The inspectors reviewed the quality control records for laboratory counting instrumentation (Gamma Detectors Nos. 1, 2, 3, and 4) used to characterize and quantify effluent samples to determine if the instruments met the required operating parameters.

The inspectors reviewed the ground water sampling procedure and observed a contractor technician obtain the quarterly sample taken from an on-site monitoring well (MW-9).

The inspectors reviewed the results of Exelon's inter-laboratory (cross check) comparison program to verify the accuracy of effluent sample analyses.

Air Cleaning System

The inspectors reviewed the air cleaning system ST results for the high efficiency particulate air (HEPA) and charcoal filtration systems installed in Unit 1 and Unit 2. Systems reviewed included the A & B Standby Gas Treatment Systems, Radwaste

Enclosure Compartment Exhaust, A & B Turbine Enclosure Equipment Compartment Exhaust, and the A & B Reactor Enclosure Equipment Exhaust. The inspectors confirmed that the air flow rates were consistent with the UFSAR values.

Dose Calculations

The inspectors reviewed liquid and gaseous effluent monthly, quarterly, and annual dose calculations for calendar years 2009 and 2010, to ensure that the licensee properly calculated the offsite dose from effluent releases, in accordance with the ODCM, and to determine if any performance indicator (criteria contained in Appendix I of 10 CFR Part 50) was exceeded.

The inspectors reviewed three (3) liquid waste and three (3) gaseous waste discharge permits to verify that the projected doses were properly calculated using representative samples from the associated waste stream.

The inspectors reviewed and discussed with the licensee the validation and verification results for the effluent software (OpenEMS) to ensure the software in use provides accurate dose calculations.

Problem Identification and Resolution

The inspectors reviewed relevant IRs and an Effluents Control Program self-assessment (LS-AA-126-1001) to evaluate the licensee's effectiveness in identifying, evaluating, and resolving effluent control issues. This review was conducted against the criteria contained in 10 CFR Part 20, technical specifications, and the Exelon's procedures.

b. Findings

No findings were identified.

4. **OTHER ACTIVITIES**

4OA1 Performance Indicator Verification (71151)

.1 Mitigating Systems Performance Index (2 samples)

a. Inspection Scope

The inspectors reviewed Exelon's submittal of the Mitigating Systems Performance Index for the Units 1 and 2 Cooling Water System (MS10) for the period of October 1, 2010 through September 30, 2011. To determine the accuracy of the performance indicator data reported during those periods, the inspectors used definitions and guidance contained in Nuclear Energy Institute (NEI) Document 99-02, "Regulatory Assessment Performance Indicator Guideline," Revision 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.

.2 RCS Specific Activity and RCS Leak Rate (4 samples)

a. Inspection Scope

The inspectors reviewed Exelon's submittal for the RCS specific activity (BI01) and RCS leak rate (BI02) performance indicators for both Unit 1 and Unit 2 for the period of October 1, 2010 through September 30, 2011. To determine the accuracy of the performance indicator data reported during those periods, the inspectors used definitions and guidance contained in NEI Document 99-02, "Regulatory Assessment Performance Indicator Guideline," Revision 6. The inspectors also reviewed RCS sample analysis and control room logs of daily measurements for RCS leakage, and compared that information to the data reported by the performance indicator.

b. Inspection Findings

No findings were identified.

.3 Occupational Exposure Control Effectiveness (1 sample)

a. Inspection Scope

The inspectors reviewed implementation of the licensee's Occupational Exposure Control Effectiveness Performance Indicator (OR01) Program for the period of January 2011 through December 14, 2011. Specifically, the inspectors reviewed dosimetry alarm reports, IRs, and associated documents, for occurrences involving locked high radiation areas, very high radiation areas, and unplanned exposures against the criteria specified in NEI 99-02, "Regulatory Assessment Performance Indicator Guideline," Revision 6, to verify that all occurrences that met the NEI criteria were identified and reported.

b. Findings

No findings were identified.

4OA2 Problem Identification and Resolution (71152 – 4 samples: 1 semi-annual trend review, 1 operator workaround annual sample, and 2 in depth review samples)

.1 Routine Review of Problem Identification and Resolution Activities

a. Inspection Scope

As required by Inspection Procedure 71152, "Problem Identification and Resolution," the inspectors routinely reviewed issues during baseline inspection activities and plant status reviews to verify that Exelon entered issues into the corrective action program at an appropriate threshold, gave adequate attention to timely corrective actions, and identified and addressed adverse trends. In order to assist with the identification of repetitive equipment failures and specific human performance issues for follow-up, the

inspectors performed a daily screening of items entered into the corrective action program and periodically attended IR screening meetings.

b. Findings

No findings were identified.

.2 Semi-Annual Trend Review

a. Inspection Scope

The inspectors performed a semi-annual review of site issues, as required by Inspection Procedure 71152, "Problem Identification and Resolution," to identify trends that might indicate the existence of more significant safety issues. In this review, the inspectors included repetitive or closely-related issues that may have been documented by Exelon outside of the corrective action program, such as trend reports, performance indicators, major equipment problem lists, maintenance rule assessments, and maintenance or corrective action program backlogs. The inspectors also reviewed Limerick's corrective action program database for the third and fourth quarters of 2011 to assess IRs written in various subject areas (equipment problems, human performance issues, etc.), as well as individual issues identified during the NRCs daily IR review (Section 4OA2.1). The inspectors reviewed the Limerick's quarterly Performance Improvement Integrated Matrix report for the third quarter of 2011, conducted under PI-AA-1001, "Performance Improvement Integrated Matrix, Revision 1," to verify that Limerick personnel were appropriately evaluating and trending adverse conditions in accordance with applicable procedures.

b. Findings and Observations

No findings were identified.

The review did not reveal any trends that could indicate a more significant safety issue. The inspectors assessed that Exelon was identifying issues at a low threshold and entering the issues into the CAP for resolution.

The inspectors performed a review of Exelon's actions in response to a negative trend identified in NRC Inspection Report 05000352, 353/2011003, dated August 4, 2011. The negative trend was associated with not entering plant issues and events into the CAP in a timely manner. The issues involved were isolated to the Operations and Maintenance departments.

Exelon entered the NRC-identified trend as well as other similar issues into the CAP as IR 1237270 and performed a common cause analysis. Exelon identified that there was a mindset that issues encountered during the performance of a work document (IR or work order) or during the performance of a procedure would be addressed as part of the initial work order document closeout or procedure change process document. Exelon determined that the established mindset represented an opportunity for improvement in the generation of IRs. Maintenance, Operations, and Engineering supervision conducted briefings with department personnel to reinforce timely IR generation and to reemphasize the threshold for IR generation. The inspectors determined that Exelon's actions were reasonable and were apparently effective based on no significant

occurrences during the review period where plant issues or events were not entered into the CAP.

.3 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.

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 entered operator workarounds and burdens into the CAP at an appropriate threshold and planned or implemented corrective actions commensurate with their safety significance.

.4 Annual Sample: Reactor Recirculation Motor Generator (RRMG) Set Issues

a. Inspection Scope

The inspectors performed an in-depth review of Exelon's evaluations and corrective actions associated with RRMG issues. Specifically, since 2009, the RRMGs have tripped or changed speed without operator demand on several occasions.

A RRMG provides a variable frequency power supply to a reactor recirculation pump (RRP) motor. The RRMG consists of a constant speed motor coupled to an alternating current (AC) generator through a fluid coupler. The recirculation flow control system positions a scoop tube in the fluid coupler which changes the speed of the AC generator. This in turn changes the speed of the reactor recirculation pump (RRP). The RRP's are used to change power level in the reactor by adjusting the flow of water through the reactor core.

The inspectors assessed Exelon's problem identification threshold, cause analyses, extent of condition reviews, compensatory actions, and the prioritization and timeliness of Exelon's corrective actions to determine whether Exelon was appropriately identifying,

characterizing, and correcting problems associated with this issue and whether the planned and completed corrective actions were appropriate. The inspectors compared the actions taken to the requirements of Exelon's corrective action program. In addition, the inspectors performed field walkdowns and interviewed engineering personnel to assess the effectiveness of the implemented corrective actions.

b. Findings and Observations

No findings were identified.

In response to several events where RRMGs changed speed without operator demand (undemanded speed changes), Exelon performed a common cause analysis in June 2009. Corrective actions included; determining the age criterion for replacement of circuit components, and determining a strategy for old and obsolete circuit cards. Exelon also performed an effectiveness review as part of their common cause analysis and appropriately determined that the corrective actions had not been effective and subsequent evaluation was necessary.

The 2A RRMG tripped twice in late 2010, which prompted Exelon to perform a root cause evaluation (IRs 1129709 and 1148152). The root cause for the 2A RRMG trips was attributed to the voltage regulator card. After replacement of the voltage regulator card, the specific problem has not reoccurred.

Based on several other undemanded speed changes, an apparent cause evaluation was completed in March 2011 (IR 1184004). The apparent cause was associated with the amplifier cards. Based on minor undemanded speed changes, the 1A, 2A, and 2B RRMGs were assigned adverse condition monitoring plans to provide guidance for monitoring the RRMGs' performance and to provide actions to address any abnormal behavior. The 2B RRMG experienced several undemanded speed changes while under the adverse condition monitoring plan, so the scoop tube for the 2B RRMG was locked. While locked it can be operated manually and all undemanded speed changes are prevented.

In 2005, as a long term corrective action, Exelon began the process for replacing the current RRMGs with adjustable speed drives. The modification will replace all components of the existing systems. The modifications were given high priority and are scheduled to be complete by 2012 on Unit 1 and 2013 on Unit 2.

The inspectors reviewed the troubleshooting methodologies, cause evaluations, and modification for RRMG replacement and did not identify any additional issues. The inspectors determined Exelon's overall response to the issues were commensurate with the safety significance, were timely, and included appropriate compensatory actions. The inspectors determined that the actions taken were reasonable to resolve the RRMG issues.

.5 Annual Sample: 13kV Cable Failures

a. Inspection Scope

The inspectors performed an in-depth review of Exelon's evaluations and corrective actions associated with IR 1051496, 1083732, and 1144472 for 13kV cable failures.

Specifically, in 2010, Limerick experienced three separate cable failures on non-safety related 13kV power cables.

The inspectors assessed Exelon's problem identification threshold, problem analysis, extent of condition reviews, compensatory actions, and the prioritization and timeliness of Exelon's corrective actions to determine whether Exelon was appropriately identifying, characterizing, and correcting problems associated with this issue and whether the planned or completed corrective actions were appropriate. The inspectors compared the actions taken to the requirements of Exelon's CAP and Title 10 of the *Code of Federal Regulations* (10 CFR) Part 50, Appendix B. The inspectors performed field walkdowns, and interviewed engineering and maintenance personnel to assess the effectiveness of the implemented corrective actions, the reasonableness of the planned corrective actions, and to evaluate the extent of any on-going cable degradation problems. In addition, the inspectors reviewed Exelon's cable monitoring program, routine cable preventive maintenance testing, selected cable test results, and cable test and replacement schedules. Specific documents reviewed are listed in the attachment to this report.

In addition, the inspectors observed replacement activities for the 2D-P501 circulating water pump motor feeder cable, which had been previously identified as degraded by tan-delta testing in January 2011. Specifically, the inspectors observed a new 15kV rated cable being pulled from the switchgear to the pump motor, and reviewed the post installation tan-delta test results.

b. Findings and Observations

No findings of significance were identified.

Exelon determined that the most probable cause of the cable failures was manufacturing defects of the Anaconda ethylene propylene rubber UniShield 15kV rated cable. Specifically, Exelon stated that an examination of a failed Anaconda cable by the Electric Power Research Institute identified water tree damage and distributed deterioration due to voids and contamination of the cable's insulating material which occurred during the manufacturing process. Exelon's corrective actions included routine cable tan-delta testing, very low frequency withstand testing, replacement of selected cables based on test results, and installation of a cable manhole water detection system to facilitate maintaining underground cables in a dry environment.

The inspectors reviewed selected IRs and cable test results for Anaconda 15kV rated cables and did not identify any additional issues. The inspectors determined Exelon's overall response to the issue was commensurate with the safety significance and included appropriate compensatory actions. The inspectors determined that the actions taken or planned were reasonable to resolve the identified cable issues.

Notwithstanding, the inspectors did identify a weakness in Exelon's cable monitoring program. Exelon had not established or implemented written procedures or instructions to perform cable tests, such as a tan-delta or very low frequency withstand test, and had not established approved acceptance criteria. The inspectors determined this was a minor issue because maintenance personnel responsible for the testing were knowledgeable of the test methods and industry standards used for evaluation of the test results; plant engineering personnel reviewed test results; and test results indicative of

cable degradation were routinely entered into the CAP for further evaluation. Exelon entered the inspector's observations into their CAP (IR 1284994).

In addition, the inspectors also identified a weakness in Exelon's cable installation program. As part of the modification process to replace a non-safety related medium voltage cable, Exelon engineering calculated the expected cable pulling tension and compared it to the maximum allowable tension specified by the cable manufacturer to ensure that no cable mechanical damage would occur during installation. The maximum tension at the end of the pull was calculated to be approximately 2,973 pounds, as compared to the manufacturer's limit of 10,000 pounds. Based on the large margin between the calculated value and the limit, Exelon engineering authorized a deviation from normal plant procedures and allowed installation without monitoring the actual pulling force with a dynamometer or tension-meter. In addition, Exelon engineering did not evaluate or specify the pulling method, such as by basket grip on the cable jacket or by pulling eye attached directly to the cable conductor. The inspectors observed that a cable tugger, rated at 8,000 pounds force maximum, was attached to the cable with a basket grip. The inspectors noted that the cable manufacturer specified that the maximum pulling force should not exceed 1,000 pounds if a basket grip were used. In addition, E-1412, "Wire and Cable Notes and Details," specified that the maximum pulling force with a basket grip was limited to 1,500 pounds. The inspector determined this was a minor issue because Exelon subsequently determined that the installation method was acceptable, based on additional information from the cable manufacturer for the pulling forces used. Exelon entered the inspectors' observations into their CAP (IR 1282881).

4OA5 Other Activities

.1 Followup on Traditional Enforcement Actions Including Violations, Deviations, Confirmatory Action Letters, Confirmatory Orders, and Alternate Dispute Resolution Confirmatory Orders (IP 92702 - 1 sample)

a. Inspection Scope

On December 23, 2010, the NRC issued a Severity Level IV NCV of 10 CFR 50.71(e), "Maintenance of Records, Making of Reports," when Exelon failed, on multiple occasions, to revise the UFSAR with information consistent with plant conditions. Specifically, Exelon personnel failed to incorporate four previously identified UFSAR inconsistencies into the September 2010 UFSAR update as required. This issue was identified as NCV 05000352, 353/2010007-01, "Failure to Update UFSAR Consistent with Plant Conditions as Required."

The objective of the inspection was to determine whether adequate corrective actions have been implemented for traditional enforcement actions including violations. To assess and document Exelon's corrective actions regarding the issued violation, the region elected to conduct IP 92702 and formally informed Exelon of the NRC's intent to conduct this inspection via the NRC Mid-Cycle letter dated September 1, 2011 (ML 112411354).

The inspectors reviewed Exelon's ACE, related IRs, self-assessment and audit reports, procedures and relevant references. The inspectors confirmed that the outstanding changes identified in the NCV and others identified during an extent of condition review

were properly processed and incorporated into the next UFSAR revision submittal. The inspectors conducted interviews with a member of the Station Ownership Committee and staff from the Engineering, Regulatory Assurance, Nuclear Oversight, Chemistry and Radiation Protection departments. The inspectors conducted an extent of condition evaluation to assess the UFSAR update program. The program was evaluated for adequacy of identification and change processing timeliness of required UFSAR changes.

b. Findings and Observations

No findings of significance were identified.

The inspectors observed that while initial corrective actions were implemented to address the NCV, subsequent internal self-assessment and follow-up activities performed by the station's Nuclear Oversight organization identified that a lack of knowledge and ownership of the UFSAR change process still existed at the station. Additional corrective actions generated from those observations included performance of an ACE, creation of a read and sign to reinforce management expectations, and further procedure enhancements. The inspectors determined that Exelon's corrective actions were appropriate to ensure required changes were incorporated into UFSAR revision submittals to the NRC.

.2 NRC Review of Exelon's Response to Non-Cited Violation EA-11-128 (IP 92702 - 1 sample)

a. Inspection Scope

On September 12, 2011, the NRC transmitted an NCV and a Green finding to Exelon related to a change Exelon made to the emergency action level (EAL) basis for EAL HU6, which introduced a decrease in effectiveness to Limerick's Emergency Plan and resulted in a violation of the requirements stipulated in 10 CFR 50.54(q). Specifically, the licensee modified the EAL Basis in EAL HU6, Revision 13, which extended the start of the 15-minute emergency classification clock beyond a credible notification that a fire is occurring or indication of a valid fire detection system alarm. This change decreased the effectiveness of the Emergency Plan by reducing the capability to perform a risk significant planning function in a timely manner. The NCV and finding were described in detail in NRC Inspection Report Nos. 05000352/2011503 and 05000353/2011503.

In response to the NCV and finding, Exelon entered the issue into their corrective action program as IR 01184333 and subsequently implemented Revision 20 of the Limerick Emergency Plan, which restored the EAL HU6 Basis to the Revision 12 guidance, thereby removing the decrease in effectiveness. The inspectors reviewed IR 01184333 and the revised version of the HU6 Basis, and discussed the corrective actions with the Limerick Emergency Preparedness staff.

b. Findings and Observations

No findings were identified. The inspectors determined that Exelon's response and corrective actions were reasonable and appropriate to address the NCV and finding, and their underlying performance deficiency. The NRC considers the issue to be closed.

4OA6 Meetings, Including Exit

On January 13, 2012, the inspectors presented the inspection results to Mr. William Maguire, Site Vice President, Limerick Generating Station, and other members of the Exelon staff. The inspectors verified that no proprietary information was retained by the inspectors or documented in this report.

ATTACHMENT: SUPPLEMENTARY INFORMATION

SUPPLEMENTARY INFORMATION

KEY POINTS OF CONTACT

Licensee Personnel

W. Maguire, Site Vice President
P. Gardner, Plant Manager
C. Rich, Director of Operations
D. Doran, Director of Engineering
R. Kreider, Director of Maintenance
P. Colgan, Director of Work Management
C. Gerdes, Security Manager
R. Dickinson, Director of Training
K. Kemper, Manager Nuclear Oversight
D. Merchant, Radiation Protection Manager
J. Hunter, Manager, Regulatory Assurance
C. Cooney, Chemistry/Radwaste Manager
M. Gillin, Sr. Manager Engineering Systems
R. Harding, Regulatory Assurance Engineer
R. Rhode, Licensed Operator Requalification Training Supervisor
D. Wahl, Effluent REMP Engineer
R. Higgins, Environmental Engineer
R. Ruffe, Operations Training Manager
J. Bendyk, Site Engineer, Ventilation
L. Konen, Chemistry Technician
B. Lance, Chemistry Manager
M. Strawn, Nuclear Oversight
A. Varghese, Site Engineer, Radiation Monitoring
M. Ajmera, Nuclear Oversight
P. Dunston, Regulatory Assurance Engineer
D. Hocker, Work Management Cycle Manager
A. Lambert, Design Engineer
L. Parlatore, Radiation Protection Technician
A. Rocco, System Engineer
D. Ryan, Senior Chemist
J. Duskin, Supervisor, Radiation Protection Instrumentation
M. Gift, Plant Engineer
R. Goskins, Instrument Technician
P. Imm, Radiological Engineering Supervisor
J. Ristetler, Supervisor – Radiation Protection
S. Sweisford, Instrument Technician
D. Cheung, Recirculation System Engineer

Other:

M. Murphy, Inspector, Commonwealth of Pennsylvania

LIST OF ITEMS OPENED, CLOSED, DISCUSSED, AND UPDATED

Opened/Closed

05000352, 353/2011005-01 NCV Inadequate Corrective Actions for a Previous NRC Finding for Programmatic Deficiencies in the Preventive Maintenance Program (Section 1R19)

Opened

None

Closed

05000352, 353/2011503-01 NCV (Traditional Enforcement) Changes to EAL Basis Decreased the Effectiveness of the Plan without Prior NRC Approval (4OA5.2)

05000352, 353/2011503-02 FIN Changes to EAL Basis Decreased the Effectiveness of the Plan without Prior NRC Approval (4OA5.2)

Discussed

05000352, 353/2010007-01 NCV Failure to Update UFSAR Consistent with Plant Conditions as Required (Section 4OA5.1)

LIST OF DOCUMENTS REVIEWED

Section 1R01: Adverse Weather Protection

Procedures

GP-7, Cold Weather Preparation and Operation, Revision 44
WC-AA-107, Seasonal Readiness, Revision 9

Issue Reports

1282530

Miscellaneous

Winter Readiness Items Long List (OPEN), Printed October 15, 2011
Winter Readiness Items Long List (OPEN), Printed November 15, 2011

Section 1R04: Equipment Alignments

Procedures

1S11.1.A (COL1), Equipment Alignment of ESW Loop 'A' System, Revision 49
1S11.1.A (COL2), Equipment Alignment of ESW Loop 'B' System, Revision 51
1S92.9.A (COL), Normal Alignment of the 4KV Safeguard Breakers, Revision 7
2S49.1.A (COL), Valve Alignment to Assure Availability of the RCIC System, Revision 12
2S92.9.A (COL), Normal Alignment of the 4KV Safeguard Breakers, Revision 3
ER-AA-310-1005, Maintenance Rule – Dispositioning between (a)(1) and (a)(2), Revision 5

MA-AA-716-004, Conduct of Troubleshooting, Revision 10
RT-2-011-251-0, ESW Loop 'A' Flow Balance, Revision 22
RT-2-011-252-0, ESW Loop 'B' Flow Balance, Revision 22
RT-2-011-254-0, ESW Loop 'B' and D Data Collection, Revision 24
S49.9.A, Routine Inspection of RCIC System, Revision 28

Condition Reports

01139996	01140214	01140215	01256288	01204207	01211382
01225223	01242648	01243451	01248348	01249126	01256276

Maintenance Orders/Work Orders

R1153697

Miscellaneous

ESW System – Maintenance Rule (a)(1) Determination (IR 1001431)
ESW System Health Report and Long Term Improvement Plan

Section 1R05: Fire Protection

Procedures

F-A-360, Unit 2 Class 1E Battery Room, Revision 6
F-D-315B, D22 Diesel Generator and Fuel Oil – Lube Oil Tank Room, Revision 8

Section 1R07: Heat Sink Performance

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R1150960

Section 1R11: Licensed Operator Requalification Program

Issue Reports

1293914

Section 1R12: Maintenance Effectiveness

Issue Reports

1191498	1194738	1240888	1275643
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Procedures

ER-AA-310-1003, Maintenance Rule – Performance Criteria Selection, Revision 3
ST-6-001-660-1, Main Turbine CIV, Stop Valve RPS, and EOC-RPT Channel Functional Test,
Revision 53

Maintenance Orders/Work Orders

A180341	C0237582	R0768612	R0768677
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Section 1R13: Maintenance Risk Assessments and Emergent Work Control

Issue Reports

1305891

Maintenance Orders/Work Orders
R1170641

Section 1R15: Operability Evaluations

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C0240530

Issue Reports

918331	1140215	1143600	1256288	1280748	1283469
1292258	1292570	1295405	1297766	1299689	

Procedures

M-095-005, Replacement of Station Battery Cells, Revision 4
RT-1-100-640-2, Monitoring for Trends in Thermal Power Calculation Inputs, Revision 12
ST-6-095-914-2, Div IV VDC 2DD101 Safeguard Battery Quarterly Inspection, Revision 27

Miscellaneous

Design Basis Document L-S-51, Fire Protection System, Revision 6
OPE-011-007, Reduced 'B' Loop RHRSW Cooling Flow Operability Evaluation, Revision 0

Section 1R19: Post-Maintenance Testing

Issue Reports

1275643	1277717	1277723	1278345	1278411	1278837
1280784	1280790	1286902			

Procedures

M-600-004, Replacement of EQ Solenoid Valves, Revision 5
ST-2-072-107-0, Div II Unit 1/Unit 2 Refuel Floor BOP Isolation LSF/SAA and SGTS Test, Revision 10
ST-4-041-210-1, Main Steam Relief Valves Test, Revision 13
ST-6-076-250-2, Standby Gas Treatment System and Reactor Enclosure Recirculation System Flow Test, Revision 36

Maintenance Orders/Work Orders

C0238106 R1144306 R1170641

Miscellaneous

A1464942, Technical Evaluation for Chattering Relay for HV-076-012A, Dated April 21, 2004

Section 1R20: Refueling and Other Outage Activities

Issue Reports

1114118	1126485	1283933	1304611	1304829	1304867
1304894	1304905	1305081			

Procedures

GP-2, Normal Plant Startup, Revision 143
GP-3, Normal Plant Shutdown, Revision 134
OT-114, Inadvertent Opening of a Relief Valve, Revision 26
ST-6-092-316-2, D22 Diesel Generator Fast Start Operability Test Run, Revision 45

Maintenance Order/Work Order
C0240449

Miscellaneous

Online PCM Templates for Fairbanks Morse EDG and Control/Timing Relays

Section 1R22: Surveillance Testing

Procedures

ST-4-051-952-2, ISI Pressure Test of RHR Loop 'B', Revision 4
ST-6-011-232-0, B Loop ESW Pump, Valve, and Flow Test, Revision 78

Miscellaneous

General Electric Hitachi Part 21: Failure to Include Seismic Input in Channel – Control Blade
Interference Customer Guidance

Section 2PS1: Radioactive Gaseous and Liquid Effluent Treatment

Procedures

ST-2-010-400-2, Radiation Monitoring – Service Water Radiation Monitor Calibration/Functional
Test
ST-2-026-401-1/2, Radioactive Gaseous Effluent Monitoring – South Stack Effluent Monitor
Channel B/b Calibration/Functional Test
ST-2-026-414-0, Radioactive Gaseous Effluent Monitoring - North Stack Effluent Monitor
Channel A Calibration/Functional Test
ST-2-026-415-0, Radioactive Gaseous Effluent Monitoring - North Stack Effluent Monitor
Channel B Calibration/Functional Test
ST-2-026-438-0, Accident Monitoring North Stack Wide Range Accident Monitor
Calibration/Functional Test
ST-2-026-400-1, Radioactive Gaseous Effluent Monitoring - South Stack Effluent Monitor
Channel A Calibration/Functional Test
ST-2-026-400-2, Radioactive Gaseous Effluent Monitoring - South Stack Effluent Monitor
Channel A Calibration/Functional Test
ST-2-026-438-0, Accident Monitoring North Stack Wide Range Accident Monitor
Calibration/Functional Test
ST-2-026-442-1/2, Radioactive Gaseous Effluent Monitor – Flow Rate Calibration/Functional
Test
ST-2-012-404-0, Radiation Monitoring - RHR Service Water Radiation Monitor, Division I,
Channel A Calibration/Functional Test
ST-2-012-405-0, Radiation Monitoring - RHR Service Water Radiation Monitor, Division I,
Channel B Calibration/Functional Test
ST-2-063-400-0, Radioactive Liquid Effluent Monitoring - Liquid Radwaste Effluent Line
Calibration/Functional Test
ST-2-063-600-0, Radioactive Liquid Effluent Monitoring-Liquid Radwaste Effluent line Functional
Test
ST-2-063-601/602-0, Radioactive Liquid Effluent Monitoring-Radwaste Discharge Pipe Flow
Calibration/Functional Test
ST-2-082-600-0, Radioactive Gaseous Effluent Monitoring – Hot Maintenance Shop
Calibration/Functional Test
ST-5-061-570-0, Radwaste Discharge Permit

ST-5-076-815-0, North Stack and Hot Maintenance Shop Weekly Iodine and Particulate Analysis
 ST-5-076-815-1, Unit 1 South Stack Weekly Iodine and Particulate Analysis
 ST-5-076-815-2, Unit 2 South Stack Weekly Iodine and Particulate Analysis
 ST-5-076-826-0, Monthly Gaseous Release Dose Calculations
 CY-LG-170-202, Sampling of Noble Gas, Tritium, Iodine, and Particulate at the Gaseous Effluent Radiation Monitors
 CY-LG-170-101, Radwaste Discharges
 CY-LG-170-301, ODCM, Revision 25
 CY-LG-170-2300, OpenEMS Effluent Management System Implementation
 CY-LG-170-2020, Non-routine Radiological Discharge
 Environmental Inc. Midwest Laboratory Procedure – Collection of Groundwater Samples for Radiological Analysis

Gaseous and Liquid Discharge Permits:

Gaseous Discharges from January through September 2011
 Liquid Discharges from February through July 2011

Issue Reports:

0073583	555128	880716	1049470	1073932	1098792
1153412	1152478	1187819	1238929	1247377	1246993
1288375	1725154	1833162			

Nuclear Oversight Reports:

LS-AA-126-1001, Radiological Effluents Controls Program Self Assessment

Miscellaneous Reports:

System Health Reports, Unit 1 and Unit 2 Process Radiation Monitors, 2nd & 3rd quarters 2011
 2009 & 2010 Annual Radioactive Effluent Release Reports, Nos. 34 & 35, Limerick Generating Station

ODCM Change Determination, AD-AA-101-F-01, Change 25

10 CFR 61 Radiochemical Analysis Results for 2010

Validation and Verification of OpenEMS software

Test Results for Charcoal/HEPA Filters for:

- A/B Standby Gas Treatment Room Ventilation
- 1A/1B & 2A/2B Turbine Enclosure Equipment Compartment
- 1A/1B & 2A/2B Reactor Enclosure Equipment Compartment
- Radwaste Enclosure Air Exhaust

RS05: Radiation Monitoring Instrumentation

Procedures:

CY-AA-130-300, Gamma Spectrometry

CY-LG-130-009, Determination of Gaseous Effluent Monitoring Setpoints

CY-LG-170-1301, Off Site Dose Calculation Manual

RP-AA-220, Bioassay Program

RP-AA-230, Operation of the Canberra Whole Body Counter

RP-AA-460, Controls for High and Locked High Radiation Areas

RP-AA-700-1100, Operation of the Eberline RO-2/2A/20, Bicron RSO-50E

RP-AA-700-1201, Operation of the MGP Instruments Telepole

RP-AA-700-1204, Operation of the Eberline SAC-4 Alpha Counter

RP-AA-700-1208, Operation of Shepherd Model 89 Calibrator
RP-AA-700-1240, Operation and Calibration of the Canberra ARGO-5AB Personnel Contamination Monitor
RP-AA-700-1301, Calibration, Source Check, Operation, and Set-up of the Eberline Beta Air Monitor, Model AMS-4
RP-AA-700-1302, Operation & Calibration of Portable Neutron Monitors
RP-AA-700-1401, Operation and Calibration of Eberline Model PM-7 Personnel Contamination Monitor
RP-AA-700-1501, Operation and Calibration of the Model SAM-9/11 Small Articles Monitor

Calibration Records Reviewed:

Calibrators:

Electrometer, Converter, Ion Chamber Probe, RadCal Model Nos. 9010/9060/10X5-60
Shepherd Calibrator Model 89, Serial Nos. 8268, 8271
Shepherd Dosimeter Calibrator, Serial No. 14035

Electronic Dosimeters:

Serial Nos. 050399, 050414, 038082, 00028396, 00043728

Laboratory Instruments:

Gamma Spectroscopy Detector Nos. 1, 2, 3, 4
Scintillation Counter Packard Tri-Carb 2900TR

Whole Body Counting Systems:

FastScan and AccuScan whole body counting systems calibrated June 2011

In-Plant Monitors:

ST-2-009-600-0, Radioactive Liquid Effluent Monitoring-Cooling Tower Blowdown Discharge Line Flow Calibration/Functional Test
ST-2-026-400-2, Radioactive Gaseous Effluent Monitoring – South Stack Effluent Monitor Calibration /Functional Test
ST-2-026-407/408/409/410/419/420/421-2: Unit 2, Accident Monitoring-Primary Containment Post-LOCA Detector Calibration
ST-2-026-407/408/409/410/418/418/420/425-1: Unit 1, Accident Monitoring-Primary Containment Post-LOCA Detector Calibration
ST-2-026-645-0, Radioactive Gaseous Effluent Monitoring – Hot Maintenance Shop Exhaust Monitor Calibration/Functional Test
ST-2-063-400-0, Radioactive Liquid Effluent Monitoring – Liquid Radwaste Discharge Line Calibration/Functional Test
ST-5-076-815-2, Unit 2 South Stack Weekly Iodine and Particulate Analysis

Observation of Daily Functional Checks and Calibration Records Reviewed

Portable Survey Instruments:

RO-2 Serial No. 332271
RSO-50E Serial No. 079909
Telepole Serial No. 0011727

Contamination Monitors:

ARGOS- 5AB Serial No. 336000
 SAM -9 Serial No. 332533
 PM-7 Serial No. 33391

Neutron Survey Instrument:

ASP-1/NRD Serial No. 078788

Issue Reports:

397306	555128	930646	939363	1015287	1030668
1070656	1072180	1123011	1125739	1142079	1153874
1161885	1162582	1202450	1202506	1230780	
1235251	1255009	1297197	1303108		

Other Documents:

Annual Bioassay Program Review for 2011
 Self Assessment Report 01138498, Radiation Monitoring Instrumentation
 Nuclear Oversight Audit Report NOSA-LIM-11-06
 Monthly Performance Indicator Reviews 2011
 Electronic Dosimeter Dose & Dose Rate Alarm Report

Section 40A1: Performance Indicator VerificationProcedures

LS-AA-2200, Mitigating System Performance Index Data Acquisition and Reporting, Revision 4
 ST-6-107-596-1/2, Drywell Floor Drain Sump/Equipment Drain Tank Surveillance Log/OPCON
 1, 2, 3, Revisions 23/26

Section 40A2: Problem Identification and ResolutionIssue Reports

0250313	0339758	0725476	0737527	0768797	0774682
0779681	0787602	0900414	0917916	1058705	1129709
1148152	1184004	1210539	1211905	1230009	1230418
1232931	1234679	1237152	1240536		

Miscellaneous

E88-1, Bailey Position Transmitter 6614500 Vendor Manual, Rev. 0
 System Health Reports, System 43, Reactor Recirculation System, Unit 1 and Unit 2, First
 Quarter 2010 through Third Quarter 2011

Section 40A5: Other ActivitiesProcedures

AD-AA-102-1001, Station Qualified Reviewer's Guide, Revision 5
 CC-AA-102, Design Input and Configuration Change Impact Screening, Revision 22
 CC-AA-103, Configuration Change Control for Permanent Physical Plant Changes, Revision 22
 CC-MA-102-1001, Design Inputs and Impact Screening – Implementation, Revision 9
 EP-AA-1008; Radiological Emergency Plan Annex for Limerick Generating Station;
 Revisions 13 and 20

LS-AA-104, Exelon 50.59 Review Process, Revision 6
 LS-AA-107, UFSAR Update Procedure, Revision 7
 LS-AA-107-1001, UFSAR Update T&RM, Revision 1
 LS-AA-125, CAP Procedure, Revision 15

Issue Reports

848142	854066	864180	921398	984331	1043794
1139033	1154820	1182195	1184333	1202672	1208490
1243696	1243778	1244852	1244876	1246925	

Documents

ECR 10-00050, Desensitize U2 SVLL Logic
 ECR 10-00204, Actuator Modification PV-C-007-141A/B (1R14)
 ECR 10-00205, ECR for FW HPU System Modification Unit 1
 ECR 10-00207, ECR for Upgrading the MCR IRM/APRM/RBM Recorders
 ECR 11-00404, HPCI Turbine Governor Speed Limit Increase
 NEI 98-03, Guidelines for Updating Final Safety Analysis Reports, June 1999
 Performance Improvement Integrated Matrix (PIIM) Action Plan, Untimely UFSAR Change
 Documentation and Submittal to the NRC, Period 3Q11

LIST OF ACRONYMS

AC	Alternating Current
ACE	Apparent Cause Evaluation
ADAMS	Agency wide Documents Access Management System
CAP	Corrective Action Program
CFR	Code of Federal Regulations
EDG	Emergency Diesel Generator
ESW	Emergency Service Water
HEPA	High Efficiency Particulate Air
HPCI	High Pressure Coolant Injection
IMC	Inspection Manual Chapter
IR	Issue Report
IST	In Service Testing
LER	Licensee Event Report
NCV	Non-Cited Violations
NEI	Nuclear Energy Institute
NRC	Nuclear Regulatory Commission
ODCM	Offsite Dose Calculation Manual
OPCON	Operating Condition
PCM	Performance Centered Maintenance
PM	Preventative Maintenance
RCIC	Reactor Core Isolation Cooling
RCS	Reactor Coolant System
RHR	Residual Heat Removal
RHRSW	Residual Heat Removal Service Water
RPS	Reactor Protection System
RRMG	Reactor Recirculation Motor Generator
RRP	Reactor Recirculation Pump
SDP	Significance Determination Process
SSC	Systems, Structures and Components
ST	Surveillance Test
UFSAR	Updated Final Safety Analysis Report