January 25, 2005

Mr. Christopher M. Crane
President and CNO
Exelon Nuclear
Exelon Generation Company, LLC
200 Exelon Way
Kennett Square, PA 19348

SUBJECT: LIMERICK GENERATING STATION - NRC INTEGRATED INSPECTION REPORT 05000352/2004005, 05000353/2004005

Dear Mr. Crane:

On December 31, 2004, the United States Nuclear Regulatory Commission (NRC) completed an inspection at your Limerick Generating Station Units 1 and 2. The enclosed integrated report documents the inspection findings which were discussed on January 7, 2005, with Mr. R. DeGregorio and other members of your staff.

This 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 self-revealing finding of very low safety significance (Green). This finding was determined to involve a violation of NRC requirements. However, because of its very low safety significance and because it is entered into your corrective action program, the NRC is treating this issue as a non-cited violation (NCV), in accordance with Section VI.A of the NRC's 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, Region I; the Director, Office of Enforcement, United States Nuclear Regulatory Commission, Washington, D.C. 20555-0001; and the NRC Resident Inspector at the Limerick facility.

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 (PARS) component of the NRC's document system (ADAMS). ADAMS is accessible from the NRC Web site at http://www.nrc.gov/reading-rm/adams.html (The Public Electronic Reading Room).

Sincerely,

/RA/

Mohamed Shanbaky, Chief
Projects Branch 4
Division of Reactor Projects

Docket Nos: 50-352; 50-353
License Nos: NPF-39; NPF-85

Enclosure: Inspection Report 05000352/2004005, 05000353/2004005
w/Attachment: Supplemental Information

cc w/encl:
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Site Vice President - Limerick Generating Station
Plant Manager, Limerick Generating Station
Regulatory Assurance Manager - Limerick
Senior Vice President - Nuclear Services
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U.S. NUCLEAR REGULATORY COMMISSION

REGION 1

Docket Nos: 50-352; 50-353

License Nos: NPF-39, NPF-85

Report No: 05000352/2004005 and 05000353/2004005

Licensee: Exelon Generation Company, LLC

Facility: Limerick Generating Station, Units 1 & 2

Location: Evergreen and Sanatoga Roads
Sanatoga, PA 19464

Dates: October 1, 2004 through December 31, 2004

Inspectors: S. Hansell, Senior Resident Inspector
C. Colantoni, Resident Inspector
B. Bickett, Resident Inspector
G. Bowman, Reactor Inspector
P. Finney, Reactor Inspector
T. Fish, Senior Operations Engineer
C. Hott, Reactor Inspector
N. McNamara, Emergency Preparedness Inspector
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Approved by: Mohamed Shanbaky, Chief
Projects Branch 4
Division of Reactor Projects

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SUMMARY OF FINDINGS

IR 05000352/2004005, IR 05000353/2004005; 10/01/2004-12/31/2004; Limerick Generating Station, Units 1 and 2; Identification and Resolution of Problems.

The report covered a 3-month period of inspection by resident inspectors and announced inspections by Senior Operation Engineer, Senior Reactor Inspectors, Reactor Inspectors, Health Physicist, and a Regional Emergency Preparedness Inspector. One Green non-cited violation (NCV) was identified. The significance of most findings is indicated by their color (Green, White, Yellow, Red) using Inspection Manual Chapter 0609, "Significance Determination Process" (SDP). 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 3, dated July 2000.

Reactor Safety

A. NRC-Identified and Self-Revealing Findings

Cornerstone: Mitigating Systems

Green. A self-revealing event resulted in a non-cited violation of Technical Specification section 6.8.1,"Administrative Controls - Procedures," because Exelon did not maintain adequate procedures to ensure the high pressure coolant injection (HPCI) and reactor core isolation cooling (RCIC) systems were filled with water. After an unexpected RCIC turbine trip during a HPCI valve test, it was determined that both systems contained air in the pump suction piping.

This finding is greater than minor because it affected the Mitigating Systems cornerstone objective of ensuring operability and reliability of both the HPCI and RCIC systems. In accordance with IMC 0609, Appendix A, "Significance Determination of Reactor Inspection Findings for At-Power Situations," the inspectors determined that the finding is of very low safety significance (Green) using a Phase 3 significance determination process evaluation.

The inspectors identified that a contributing cause of the finding is related to the problem identification and resolution cross-cutting area, in that, station personnel had prior opportunities to resolve known adverse system interactions and potential air voiding in the HPCI and RCIC system piping. (Section 4OA2)

B. Licensee-Identified Violations.

None.

Report Details

Summary of Plant Status

Unit 1 began this inspection period operating at 100% power. On October 15, 2004, power was reduced to 99.3% due to feedwater flow instrumentation issues and remained there for the remainder of 2004.

Unit 2 began this inspection period operating at 100% power. On December 5, 2004, power was reduced to 65% to repair an EHC leak on control valve #4. Reactor power was returned to 100% on December 6, 2004.

1. REACTOR SAFETY

Cornerstones: Initiating Events, Mitigating Systems, Barrier Integrity

1R01 Adverse Weather Protection (71111.01- 2 samples)

a. Inspection Scope

Seasonal Readiness. The inspectors reviewed the station's cold weather preparations and toured the river water intake structure, circulating and service water pump house, Units 1 and 2 condensate storage tank areas, and various areas of the turbine and reactor enclosures. The inspectors verified the adequacy of cold weather protection for key components within these structures. The following procedures were reviewed:

- GP-7, "Cold Weather Preparation and Operation;
- S10.6A, "Swapping Operating service Water Pumps."

Adverse Weather Readiness. On October 2, 2004, the inspectors reviewed Exelon procedure SE-9, "Preparation for Severe Weather," related to reduced Schuylkill River water make-up pump flow due to leaves in the river. The inspectors walked down the Schuylkill River water pump house. The inspectors reviewed the actions taken to remove the leaves from the river water intake screens and operator actions to alternate river water pump flows. In addition to the Schuylkill River supply, makeup water was also pumped from the Perkiomen Creek. The combined water flow was sufficient to maintain both units at full power operation. These site actions were captured in Issue Report No. 268941.

b. Findings

No findings of significance were identified.

1R02 Evaluation of Changes, Tests, or Experiments (71111.02 - 24 samples)

a. Inspection Scope

The inspectors reviewed selected safety evaluations associated with the initiating event, mitigating system, and barrier integrity cornerstones to verify that changes to the facility

or procedures, as described in the Updated Final Safety Analysis Report (UFSAR), were reviewed and documented in accordance with 10 CFR 50.59. The inspectors also verified that the safety issues pertinent to the changes were properly resolved or adequately addressed. The safety evaluations reviewed were completed during the past two years, and were selected based on the safety significance of the changes and the risk to structures, systems and components. The inspectors reviewed eight safety evaluations.

The inspectors also reviewed selected screen-out evaluations for changes and tests for which Limerick determined that safety evaluations were not required. The inspectors reviewed sixteen issues that were screened out. This review was performed to verify that Limerick's threshold for performing safety evaluations was consistent with the requirements of 10 CFR 50.59. In addition, the inspectors reviewed Limerick's administrative procedures that control the screening, preparation, and issuance of the safety evaluations to ensure that the procedure adequately covered the requirements of 10 CFR 50.59. The inspectors also reviewed selected Issue Reports (IRs), engineering self-assessments, and nuclear oversight audit reports associated with the 10 CFR 50.59 process. The documents reviewed are listed in the Attachment to this report. In addition to the documentation that the inspectors reviewed, copies of information requests and e-mail correspondence between the NRC and Limerick personnel are in ADAMS under accession numbers ML043350311 and ML043350431, respectively.

b. Findings

No findings of significance were identified.

1R04 Equipment Alignment (71111.04 - 4 samples)

a. Inspection Scope

Partial System Walkdown. (71111.04Q- 3 samples) The inspectors performed partial system walkdowns to verify system and component alignment and to note any discrepancies that would impact system operability. The inspectors verified selected portions of redundant or backup systems or trains were available while certain system components were out-of-service. The inspectors reviewed selected valve positions, general condition of major system components, and electrical power availability. This inspection activity represented three samples. The partial walk-downs included the following systems:

- Unit 1 Division 1 primary containment isolation valves
- Unit 1 "A" residual heat removal loop with "B" residual heat removal pump out-of-service
- Unit 2 reactor core isolation cooling system walkdown with high pressure coolant injection system out-of-service

Complete System Walkdown. (71111.04S - 1 sample) The inspectors performed a complete system walkdown on the Unit 1 Reactor Core Isolation Cooling (RCIC) system

to verify that the equipment was aligned properly. The walkdown included reviews of valve positions, major system components, electrical power availability, and equipment deficiencies. The inspectors reviewed system checkoff lists, system operating procedures, the system piping and instrumentation diagram and updated final safety analysis report. The inspectors reviewed outstanding maintenance activities and condition reports associated with the Unit 1 RCIC system to determine if they would adversely affect system operability. The inspectors verified in the control room and in the RCIC system rooms that valves were correctly positioned and did not exhibit leakage that would impact the function of the valve. The inspectors also verified that electrical power was available, major components were labeled, hangers and supports were functional, and essential support systems were operational. This inspection activity represented one sample. The documents included in the review are listed in the Attachment.

b. Findings

No findings of significance were identified.

1R05 Fire Protection (71111.05 - 11 samples)

a. Inspection Scope

Tour Plant Areas Important to Reactor Safety. (71111.05Q - 11 samples) The inspectors toured high risk areas at Limerick Units 1 and 2 to assess Exelon's control of transient combustible material and ignition sources, fire detection and suppression capabilities, fire barriers, and any related compensatory measures. The inspectors reviewed the respective pre-fire action plan procedures and Section 9A of the UFSAR. This inspection activity represented eleven samples. The following fire areas were inspected:

- D11-D13 emergency diesel generator (EDG) rooms during monthly run
- Unit 1 and Unit 2 refuel floor areas
- D12-D14 emergency diesel generator rooms
- Unit 1 "B&D" residual heat removal pump room
- Control structure auxiliary equipment room
- Schuylkill River water pump house
- Unit 1 "A" and "B" residual heat removal pump rooms
- Unit 2 reactor core isolation cooling room
- D11/D13 emergency auxiliary switchgear rooms
- Remote shutdown room and plant generation control room
- Unit 2 core spray pump rooms

b. Findings

No findings of significance were identified.

1R06 Flood Protection Measures (71111.06 - 1 sample)

a. Inspection Scope

The inspectors reviewed documents and inspected structures, systems, and components relative to the adequacy of external flood protection measures for safety related and risk significant systems and structures. The inspectors interviewed plant personnel, performed walkdowns of the relevant areas to verify the adequacy of water tight doors, flood mitigation doors, site topography and other flood protection features. The inspector verified that adequate procedures were in place to identify and respond to floods. This inspection activity represented one external flood protection sample. The inspectors verified the adequacy of flood protection measures for:

- External flooding (Unit 1 & 2 emergency diesel generator and reactor building enclosures)

The following documents were included in the review:

- UFSAR Section 3.4.1
- Procedure SE-4-3, “Flooding External to Power Block”
- Analysis NPB-13, “Moderate Energy Line Break Analysis - Compartment Flooding”
- Analysis NPB-14, “Moderate Energy Line Break Analysis for Reactor Enclosure; Control Structure; and Emergency Diesel Enclosure”

b. Findings

No findings of significance were identified.

1R11 Licensed Operator Requalification (71111.11 - 2 samples)

1. Simulator Evaluation (71111.11Q - 1 sample)

a. Inspection Scope

On October 13, 2004, the inspectors observed an annual exam simulator scenario evaluation to assess licensed operator performance and the evaluator’s critique. The inspectors discussed the results with operators, operations management, and training instructors. This inspection activity represented one sample. The inspectors also referred to the simulator scenario document and the following emergency operating procedures:

- T-101, “RPV Control;”
- T-102, “Primary Containment Control;”
- T-112, “Emergency Blowdown”

b. Findings

No findings of significance were identified.

2. Licensed Operator Requalification Program (71111.11A - 1 sample)

a. Inspection Scope

On December 10, 2004, the inspectors conducted an in-office review of licensee annual operating test results for 2004. The comprehensive written exam was not administered this year. The inspection assessed whether pass rates were consistent with the guidance of NRC Manual Chapter 0609, Appendix I, “Operator Requalification Human Performance Significance Determination Process (SDP).” The inspectors verified that:

- Crew failure rate was less than 20%. (Crew failure rate was 0%.)
- Individual failure rate on the dynamic simulator test was less than or equal to 20%. (Individual failure rate was 2%.)
- Individual failure rate on the walk-through test was less than or equal to 20%. (Individual failure rate was 0%.)
- Overall pass rate among individuals for all portions of the exam was greater than or equal to 75%. (Overall pass rate was 98%.)

b. Findings

No significant findings were identified.

1R12 Maintenance Effectiveness (71111.12 - 3 samples)

a. Inspection Scope (71111.12Q - 3 samples)

The inspectors evaluated the follow-up actions for selected system, structure, or component (SSC) issues and reviewed the performance history of these SSCs to assess the effectiveness of Exelon's maintenance activities. The inspectors reviewed Exelon's problem identification and resolution actions, as applicable, for these issues to evaluate whether Exelon had appropriately monitored, evaluated, and dispositioned the issues in accordance with Exelon’s procedures and the requirements of 10 CFR 50.65(a)(1) and (a)(2), "Requirements for Monitoring the Effectiveness of Maintenance." In addition, the inspectors reviewed selected SSC classification, performance criteria and goals. The inspectors reviewed the associated maintenance action request and discussed the issue with engineering personnel. This inspection activity represented three samples. The following issues were reviewed:

- Emergency DC light test failure (IR #271555)
- 500 kV 225 circuit breaker trip (IR #263211)
- Emergency service water leaks (CR #272349)

b. Findings

No findings of significance were identified.

1R13 Maintenance Risk Assessments and Emergent Work Evaluation (71111.13 - 7 samples)

a. Inspection Scope

The inspectors reviewed the assessment and management of selected maintenance activities to evaluate the effectiveness of Exelon's risk management for planned and emergent work. The inspectors compared the risk assessments and risk management actions to the requirements of 10 CFR 50.65(a)(4) and the recommendations of NUMARC 93-01 Section 11, "Assessment of Risk Resulting from Performance of Maintenance Activities." The inspectors evaluated the selected activities to determine whether risk assessments were performed when required and appropriate risk management actions were identified.

The inspectors reviewed scheduled and emergent work activities with work control center planning personnel to verify whether risk management action threshold levels were correctly identified. The inspectors assessed those activities to evaluate whether appropriate implementation of risk management actions were performed in accordance with Exelon's procedures.

The inspectors compared the assessed risk configuration to the actual plant conditions and any in-progress evolutions or external events to evaluate whether the assessment was accurate, complete, and appropriate for the issue. The inspectors performed control room and plant walkdowns to verify whether the compensatory measures identified by the risk assessments were appropriately performed. This inspection activity represented seven samples. The selected maintenance activities included:

- Unit 2 main condenser air ejector discharge high radiation alarm due to fuel leak (IR #268704)
- Unit 1 main generator automatic voltage regulator rheostat replacement (WO #C02117031)
- Unit 1 diesel generator (D14) load reject test
- Unit 2 electro-hydraulic control (EHC) leak repair on control valve #4
- Unit 1 main turbine RPS/EOC-RPT channel functional testing
- Unit 2 Reactor water level transient during HPCI system outage window
- Inadvertent securing of Unit 2 Reactor HVAC supply fans

The inspectors reviewed the following documents:

- WC-LG-101-1001, Rev. 3, "Guideline for the performance of on-line work/on-line system outages"
- WC-AA-101, Rev. 10, "On-line Work Control Process"
- ST-6-092-324-1, Rev. 1, "D14 LOCA/LOAD Reject Test"

- ST-6-001-660-1, Rev.40, “Main Turbine CIV, STOP valve RPS-EOC Channel Functional Test”

b. Findings

No findings of significance were identified.

1R14 Personnel Performance During Non-routine Plant Evolutions (71111.14 - 1 samples)

a. Inspection Scope

Non-routine/Transient Operations. The inspectors observed and reviewed licensed operator performance during the following non-routine evolution and off-normal condition:

- Unit 2 reactor level transient due to ‘2B’ reactor feed pump minimum flow controller failure

The following documents were reviewed:

- OT-100, Rev. 26, “Reactor Low Level”
- GP-5, Rev. 112, “Steady State Operations”
- GP-5, Appendix 2, Rev. 32, “Planned Rx Maneuvering Without Shutdown”
- NF-LG-721-1005, Rev. 0, “U2-Reactor Maneuvering Shutdown Instructions”

This inspection activity represents one sample.

b. Findings

No findings of significance were identified.

1R15 Operability Evaluations (71111.15 - 5 samples)

a. Inspection Scope

The inspectors reviewed operability determinations that were selected based on risk insights, to assess the adequacy of the evaluations, the use and control of compensatory measures, and compliance with the Technical Specifications (TS). In addition, the inspectors reviewed the selected operability determinations to verify whether the determinations were performed in accordance with Exelon Procedure LS-AA-105, “Operability Determinations.” The inspectors used the Technical Specifications, UFSAR, associated Design Basis Documents, and applicable action request and issue report documents during these reviews. This inspection activity represented five samples. The issues reviewed included:

- “D” emergency service water low discharge pressure alarm, IR #262505
- D13 diesel generator speed indication, IR #262831

- Unit 2 control rod #02-27 blue light during single rod scram, IR #264354
- Unit 1 “A” residual heat removal pump motor oil cooler emergency service water leak, IR #273124, AR #1467643
- Unit 2 “B” residual heat removal pump cooler, 2F-V210 did not auto start when 2B residual heat removal pump was started, IR #275933

b. Findings

No findings of significance were identified.

1R16 Operator Workarounds (71111.16 - 4 samples)

a. Inspection Scope

The inspectors reviewed the most significant control room deficiencies, equipment trouble tags, and selected corrective action reports to determine whether these items would affect the functional capability of a system or a human reliability response during an event. The inspectors evaluated the operators’ ability to implement abnormal and emergency operating procedures during postulated plant transients with the existing equipment deficiencies. The review included an evaluation of the cumulative and synergistic effects of the identified operator work-arounds and challenges. In addition to the cumulative effects sample, this inspection activity represents four operator work-around samples.

Significant Operator Work-Arounds and Challenges

C 1A reactor feed pump minimum flow isolation valve closed due to leakage
C Stand-by gas treatment system flow switch troubleshooting and repair
C Reactor vessel water level drop when switching to automatic feedwater control

The inspectors included the following documents in their review:

Procedures and Documents

C Operations Work Arounds / Challenges Ready Matrix
C Condition reports: 139444, 143517, 215309, 216259, 264354, 268272
C Action requests: A1344657, A1410497, A1428230, A1462527
C OP-AA-102-103, Rev. 1, “Operator Work-Around Program”
C Work order C0209232
C Maintenance Manpower Planning System - Main Control Room Distractions

b. Findings

No findings of significance were identified.

1R17 Permanent Plant Modifications (71111.17 - 9 samples)

1. Standby Gas Treatment System Flow Element Replacement and Relocation (71111.17A - 1 sample)

a. Inspection Scope

The inspectors reviewed the analysis for the standby gas treatment system flow element, FSL-076-340A, replacement and relocation. The inspectors reviewed the following documents to verify that the design basis, licensing basis, and performance capability of the standby gas system were not degraded by this modification:

- ECR-04-00406, Rev. 1, FSL-076-340A Replacement and Relocation
- CC-AA-103, Rev. 8, Configuration Change Control
- CC-AA-103, Attachment G, Rev.8, Screening Criteria for Equivalent Changes
- DBD L-S-32, Rev. 9, Standby Gas Treatment and Reactor Enclosure Recirculation System
- Various Model 72 and Model FLT93S specifications and vendor data (Doc. No. ECR-04-00406)
- DWG E-0483, Rev. 13
- DWG JT-09164, Rev. 9
- A1428230, A1344651, A1344657

This inspection activity represented one sample.

b. Findings

No findings of significance were identified.

2. Risk Significant Permanent Plant Modifications (71111.17B - 8 samples)

a. Inspection Scope

The inspectors reviewed selected risk significant permanent plant modification packages to verify that: (1) the design bases, licensing bases, and performance capability of risk significant structures, systems or components had not been degraded as a result of the modification; and (2) modifications performed during increased risk configurations did not place the plant in an unsafe condition. The modification packages were selected from the design changes that were closed within the past two years. The plant modifications were selected from the initiating event, mitigating system, and barrier integrity cornerstones. The inspectors reviewed eight modifications.

For the modifications selected, the inspectors reviewed the design inputs, assumptions, and calculations. The inspectors also reviewed design change notices that were issued during the installation to confirm that the problems associated with the installation were adequately resolved. In addition, the inspectors reviewed the post-modification testing, functional testing, and instrument calibration records to determine readiness for

operations. Finally, the inspectors reviewed the affected procedures, drawings, design basis documents, and relevant UFSAR sections to verify that the affected documents were appropriately updated. The inspectors reviewed selected issue reports, engineering self-assessments, and nuclear oversight audits associated with the modification process. The documents reviewed are listed in the Attachment to this report. In addition to the documentation that the inspectors reviewed, copies of information requests and e-mail correspondence between the NRC and Limerick personnel are in ADAMS under accession numbers ML043350311 and ML043350431, respectively.

b. Findings

No findings of significance were identified.

1R19 Post Maintenance Testing (71111.19 - 6 samples)

a. Inspection Scope

The inspectors observed portions of post-maintenance testing activities in the plant to determine whether the tests were performed in accordance with the approved procedures. The inspectors assessed the test's adequacy by comparing the test methodology to the scope of maintenance work performed. In addition, the inspectors evaluated the test acceptance criteria to verify whether the test demonstrated that the tested components satisfied the applicable design and licensing bases and the Technical Specification requirements. The inspectors reviewed the recorded test data to determine whether the acceptance criteria were satisfied. This inspection activity represented six samples. The maintenance activities reviewed included:

- Emergency diesel generator test following synchro-scope replacement
- 2A residual heat removal pump, valve, and flow test following the 2A pump system outage window
- Unit 1 main generator automatic voltage regulator rheostat replacement and swap from manual to automatic operation (WO #C0211703)
- 1B residual heat removal pump valve and flow test following the 1B pump system outage window
- Unit 2 Electro-hydraulic control leak repair at control valve #4
- Standby gas treatment flow switch replacement (WO #C0209232)

b. Findings

No findings of significance were identified.

1R22 Surveillance Testing (71111.22 - 5 samples)

a. Inspection Scope

The inspectors reviewed and observed portions of the following surveillance tests, and compared test data with established acceptance criteria to verify the systems demonstrated the capability of performing the intended safety functions. The inspectors also verified that the systems and components maintained operational readiness, met applicable Technical Specification requirements, and were capable of performing the design basis functions. This inspection activity represented five samples. The observed or reviewed surveillance tests included:

- ST-2-041-801-1, Reactor Protection System Main Steam Isolation Valve Time Response Testing
- ST-2-049-604-1, Reactor Core Isolation Cooling Steam Line Differential Pressure-High, Division 3, Channel 'C'
- ST-2-072-101-1, Division I NSSSS Logic System Functional Test
- ST-2-074-627-2, Functional Check of Unit 2 Average Power Range Monitor 2
- ST-6-092-321-1, D11 Emergency Diesel Generator Loss-Of-Coolant Accident/LOAD Reject Testing and Fast Start Operability Test Run

b. Findings

No findings of significance were identified.

1R23 Temporary Plant Modifications (71111.23 - 1 sample)

a. Inspection Scope

The inspectors reviewed the following temporary plant modification:

- Unit 1 feedwater flow sodium-24 tracer test, 50.59 screening No. LG20045095

The inspectors verified that the temporary change did not adversely affect system or support system availability, or adversely affect a function important to plant safety. The inspectors verified that the applicable design and licensing bases were considered and that 10 CFR 50.59 reviews were appropriate. This inspection activity represented one sample.

b. Findings

No findings of significance were identified.

Cornerstone: Emergency Preparedness

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

a. Inspection Scope

A regional in-office review was conducted of Exelon's revisions to the emergency plan, implementing procedures and EALs which were received by the NRC during the period of October - December 2004. A detailed review was conducted of plan aspects related to the risk significant planning standards (RSPS), such as classifications, notifications and protective action recommendations. In addition, a review was conducted for non-RSPS portions. These changes were reviewed against 10 CFR 50.47(b) and the requirements of Appendix E and they are subject to future inspections to ensure that the combination of these changes continue to meet NRC regulations. The inspection was conducted in accordance with NRC Inspection Procedure 71114, Attachment 4, and the applicable requirements in 10 CFR 50.54(q) were used as reference criteria. This inspection activity represented one sample.

b. Findings

No findings of significance were identified.

2. RADIATION SAFETY

Cornerstone: Public Radiation Safety

2PS2 Radioactive Material Processing and Transportation (71122.02 - 6 samples)

a. Inspection Scope

During the period October 18-22, 2004, the inspectors conducted the following activities to verify that the licensee's radioactive material processing and transportation programs complied with the requirements of 10 CFR 20, 61, and 71; and Department of Transportation (DOT) regulations 49 CFR 170-189.

Radioactive Waste System Walkdown

The inspectors walked down accessible portions of the radioactive liquid and solid waste collection/processing systems with the cognizant system engineer. The inspectors evaluated if the systems and facilities were consistent with the descriptions contained in the Updated Final Safety Analysis Report (UFSAR) and Process Control Program (PCP), evaluated the general material conditions of the systems and facilities, and identified any changes to the systems. The inspectors evaluated recent changes made to the radwaste processing systems and their potential impact, and reviewed the current processes for transferring radioactive resin and sludge to shipping containers and the subsequent de-watering process.

The inspectors discussed with the system engineer the status of various abandoned-in-place systems, and the administrative and physical controls for these systems including the components of the radwaste evaporators and centrifuges. The inspectors visually inspected various radwaste material storage locations with the Shipping Specialist, including areas of the Radwaste Processing Building and yard area.

Waste Characterization and Classification

The inspection included a selective review of the waste characterization and classification program for regulatory compliance, including:

the radio-chemical sample analysis results for various radioactive waste streams
the development of scaling factors for hard-to-detect radionuclides
methods and practices to detect changes in waste streams
characterization and classification of waste relative to 10 CFR 61.55 and to determine the DOT shipment subtype per 49 CFR 173.

Shipment Preparation

The inspection included a review of radioactive waste program records, shipment preparation procedures, and training records to assess regulatory compliance, including

- review of radioactive material shipping logs for calendar years 2003 and 2004
- verification that the relevant shipping procedures and training documents have been revised to reflect recent changes to the transportation regulations in 49 CFR Parts 171-178 and 10 CFR Part 71, as a result of adoption of recent final rules for compatibility with the International Atomic Energy Agency Transportation Standards, effective October 1, 2004
- verification of appropriate NRC (or agreement state) license authorization for shipment recipients for five (5) recent shipments listed in the shipping records section (below)
- verification that training was provided to appropriate personnel responsible for classifying, handling, and shipping radioactive materials, in accordance with NRC Bulletin 79-19 and 49 CFR 172 Subpart H

Shipment Records

The inspectors selected and reviewed records associated with five (5) non-excepted shipments of radioactive materials made since the last inspection of this area. The shipments were Nos. MW-03-010, MW-03-017, MW-03-022, MW-04-012, and MW-04-015. The following aspects of the radioactive waste packaging and shipping activities were reviewed:

- implementation of applicable shipping requirements including proper completion of manifests
- implementation of specifications in applicable certificates-of-compliance, for the approved shipping casks, including limits on package contents

- classification of radioactive materials relative to 10 CFR 61.55 and 49 CFR 173
- labeling of containers relative to container dose rate
- radiation and contamination surveys of packages
- placarding of transport vehicles
- conduct of vehicle checks
- providing of emergency instructions to the driver
- completion of shipping papers
- notification by the recipient that the radioactive materials have been received

b. Findings

No findings of significance were identified.

3. OTHER ACTIVITIES

4OA1 Performance Indicator Verification (71151 - 16 Samples)

a. Inspection Scope

The inspectors reviewed Exelon's performance indicator (PI) data, for the period of September 2003 through September 2004, to verify whether the PI data was accurate and complete. The inspectors examined selected samples of PI data, PI data summary reports, and plant records. The inspectors compared the PI data against the guidance contained in Nuclear Energy Institute (NEI) 99-02, revision 2, "Regulatory Assessment Performance Indicator Guideline." This inspection activity represented 14 samples. The following indicators and Exelon documents listed in the Attachment were included in this review:

Mitigating Systems Cornerstone Performance Indicators

- Units 1 & 2 reactor core isolation cooling system unavailability
- Units 1 & 2 high pressure coolant injection system unavailability
- Units 1 & 2 emergency AC power system unavailability
- Units 1 & 2 residual heat removal system unavailability

NRC Initiating Events Performance Indicators

- Units 1 & 2 unplanned power changes per 7000 critical hours

NRC Barrier Integrity Performance Indicators

- Units 1 & 2 reactor coolant system dose equivalent iodine specific activity and observation of a reactor coolant sample
- Units 1 & 2 reactor coolant system identified leak rate measured by the drywell leakage calculation

Occupational Exposure Control Effectiveness (1 sample)

The inspectors reviewed implementation of the licensee's Occupational Exposure Control Effectiveness Performance Indicator (PI) Program. Specifically, the inspectors reviewed recent Condition Reports, and associated documents, for occurrences involving locked high radiation areas, very high radiation areas, and unplanned exposures against the criteria specified in Nuclear Energy Institute (NEI) 99-02, Regulatory Assessment Performance Indicator Guideline, Revision 2, to verify that all occurrences that met the NEI criteria were identified and reported as performance indicators. This inspection activity represents the completion of one (1) sample relative to this inspection area; completing the annual inspection requirement.

RETS/ODCM Radiological Effluent Occurrences (1 sample)

The inspectors reviewed relevant effluent release reports for the period January 1, 2004 through October 1, 2004, for issues related to the public radiation safety performance indicator, which measures radiological effluent release occurrences that exceed 1.5 mrem/qtr whole body or 5.0 mrem/qtr organ dose for liquid effluents; 5mrads/qtr gamma air dose, 10 mrad/qtr beta air dose, and 7.5 mrads/qtr for organ dose for gaseous effluents. This inspection activity represents the completion of one (1) sample relative to this inspection area; completing the annual inspection requirement.

The inspectors reviewed the documents listed in the Attachment to ensure the licensee met all criteria of the performance indicator from the fourth quarter 2003 to the third quarter 2004 (4 quarters).

b. Findings

No findings of significance were identified.

4OA2 Problem Identification and Resolution (PI&R)

1. Routine PI&R Review

The inspectors reviewed selected issue reports (IRs), as part of the routine baseline inspection documented in this report. The IRs were assessed to verify whether the full extent of the various issues were adequately identified, appropriate evaluations were performed, and reasonable corrective actions were identified. The inspectors evaluated the IRs against the requirements of LS-AA-125, "Corrective Action Program (CAP) Procedure," and 10 CFR 50, Appendix B, Criterion XVI, "Corrective Action." During this inspection period, the inspectors performed a screening review of each item that Exelon entered into their corrective action program, to assess whether there were any unidentified repetitive equipment failures or human performance issues that might warrant additional follow-up.

2. Semi-Annual PI&R Trend Review

a. Inspection Scope

The inspectors reviewed a list of 1200 condition report (CR) and action request (AR) items that Exelon initiated from June 25, 2004, thru December 27, 2004. The review was performed as part of the semi-annual PI&R trend review of the Limerick corrective action program. A sample of Level 5D CRs were reviewed to determine if issues classified as 'enhancements' were in fact not associated with a corrective action deficiency. In addition, the corrective and elective maintenance backlogs were sampled to verify whether the full extent of the issues were adequately identified and corrective actions were performed or scheduled appropriately with the safety significance of the maintenance item. The inspectors evaluated the ARs/CRs against the requirements of LS-AA-125, "Corrective Action Program (CAP) Procedure," and 10 CFR 50, Appendix B, Criterion XVI, "Corrective Action." The 21 CRs reviewed in detail were: 225921, 228978, 238323, 240745, 246383, 246639, 248847, 251133, 264620, 265411, 270151, 275586, A149520, A1491372, A1492542, A14407714, A1461038, A1495879, A1493383, A1465308, and A1487889. This inspection activity represented 1 semi-annual PI&R trend review.

b. Findings & Observations

No findings of significance were identified.

Inspectors did note in their review of Level 5 IRs that three of the reports reviewed (IR 240745, 246639, 265411) were issues that would have been more appropriately classified as Level 4 IRs. In addition, the inspectors noted that there is limited corrective action procedural guidance to assist station personnel in making an appropriate determination between Level 4 and 5 IRs. Level 5 IRs are considered only enhancements while Level 4 IRs indicate a deficiency.

3. Annual Sample Review - Air Voiding of HPCI/RCIC Suction Piping (71152 - 1 Sample)

a. Inspection Scope

The inspectors completed one sample review regarding Exelon's evaluation and corrective actions for the April 2004 high pressure coolant injection (HPCI) and reactor core isolation cooling (RCIC) systems interaction event that revealed air trapped in the suction lines of both systems during HPCI surveillance testing. Condition reports and action requests were reviewed to ensure that the full extent of the issue was understood and addressed in Limerick's corrective action program. These reports documented Exelon's root cause analysis for this issue and identified corrective actions to prevent recurrence. The inspectors also reviewed surveillance and operations procedures, performed system walkdowns, and interviewed station personnel to ensure an appropriate causal analysis was performed, and appropriate corrective actions were identified. The inspectors evaluated Exelon's actions against the requirements of

Exelon's corrective action program as delineated in procedure LS-AA-125, "Corrective Action Program," and 10 CFR 50, Appendix B, Criterion XVI, "Corrective Action."

b. Findings

Introduction:

A self-revealing event resulted in a (Green) non-cited violation (NCV) of TS 6.8.1," Administrative Controls - Procedures," because Exelon did not maintain adequate procedures to ensure the high pressure coolant injection (HPCI) and reactor core isolation cooling (RCIC) systems were filled with water.

Description:

Exelon procedures S49.3.A,"RCIC Fill and Vent," and S55.3.A,"HPCI Fill and Vent," did not contain adequate instructions for plant operators to vent air introduced into various sections of HPCI and RCIC suction piping during drain and fill operations. Specifically, the HPCI fill and vent procedure was inadequate to ensure an air volume between the HPCI suppression pool suction check valve (55-1F045) and isolation valve (55-1F041) would be vented properly. A vent valve has always been installed for this section but was not included in the procedure. In addition, the valve 55-1F045 bonnet area was not able to be properly vented. The RCIC fill and vent procedure was inadequate in that it lacked guidance that the steam condensing mode piping connected to the RCIC pump suction was vented after fill operations.

Exelon drained and filled the RCIC system in February 2004 and the HPCI system in March 2004 for maintenance work, including an inspection of valve 55-1F045. HPCI and RCIC were declared operable after the suction pipes were filled, vented, and pump flow tests were performed. On April 20, 2004, during performance of ST-2-055-601-1," ECCS - CST Level - DIV 2 (HPCI) Functional Test," operators received a Unit 1 RCIC turbine trip on low pump suction pressure. Both HPCI and RCIC systems are normally aligned to the condensate storage tank (CST) and share a common suction line. Both systems have check valves installed to prevent undesired system interactions. During the test, operators input a low CST level signal which automatically realigns HPCI suction to the suppression pool. During the HPCI suction swap-over to the suppression pool suction, a hydraulic transient occurred due to air voiding from the HPCI suppression pool suction pipe to the HPCI CST suction pipe, and ultimately into the smaller RCIC suction pipe. Expansion and contraction of these air voids, in both systems, created a pressure wave of sufficient magnitude that traveled through the common CST suction line into the RCIC pump suction. This resulted in RCIC suction high and low pressure alarms and a RCIC turbine trip due to low suction pressure. The reactor operator was able to reset the RCIC turbine trip from the control room.

There have been multiple opportunities to identify unvented sections of HPCI and RCIC piping and review the adequacy of fill and vent procedures. In 1994, when the station abandoned the steam condensing mode piping, no procedural or system review identified any potential issues with venting this abandoned section that was still

connected to the RCIC suction piping. Events in 1996 and 1997 during HPCI flow surveillances revealed air voids in common CST suction piping and missed opportunities to address procedural adequacy. At this time, Limerick's review of HPCI procedures for fill and vent identified areas of unvented sections but was limited to only the CST suction line and did not include the suppression pool suction line. In addition, it appears a limited review was done on the RCIC fill and vent procedures that determined them to be adequate during prior reviews. Exelon's root cause team noted a weakness in the station response to some industry operating experience that addressed air voiding and potential procedural deficiencies. Due to the 2004 RCIC turbine trip event, Exelon has implemented procedural changes for both systems to address venting areas that were previously voided.

Analysis:

This finding is a performance deficiency because Limerick did not maintain adequate procedures to ensure that HPCI and RCIC suction piping were full of water following outage work on both systems. This resulted in a condition where: for approximately 31 hours HPCI was inoperable due to air in its suction piping and for another approximately 33 days the RCIC turbine would have tripped if the HPCI suction switched from the CST to the suppression pool. However, for the 33 day period credit was given for the ability to recover RCIC, because operators had procedures in place to allow resetting the turbine trip throttle valve. The issue was greater than minor because it affected the Mitigating Systems cornerstone objective of ensuring operability and reliability of both the HPCI and RCIC systems. The issue was evaluated in Phase 1 of the SDP as requiring a Phase 2 evaluation because of the effect on the high pressure injection (HPI) safety function. The Region I senior reactor analyst performed a Phase 3 evaluation because the Phase 2 result was overly conservative due to the unavailability of two systems.

The Phase 3 evaluation determined that the issue was of very low safety significance (Green), using the Limerick Standardized Plant Analysis Review model, Rev 3.10, dated December 10, 2004. The analysis determined the cumulative increase in internal initiating event core damage frequency was in the high E-8 range (9 in 100,000,000), given the effects on HPCI and RCIC discussed above. The dominant core damage sequence was a transient with the failure to remove decay heat using the main condenser followed by the failure of high pressure injection safety function (failure of HPCI and RCIC) and the failure of operators to manually depressurize the reactor. Manual reactor depressurization would allow the use of the low pressure injection system to ensure core cooling.

The inspectors noted missed opportunities to thoroughly evaluate procedural adequacy and address adverse HPCI and RCIC system interactions which is indicative of a cross-cutting weakness with respect to problem identification and resolution. Both systems were drained and filled as recently as February/March 2004 and system interactions in the form of RCIC discharge alarms have more recently been documented and updated in action requests (AR), A1252154 and A1257679. Although station personnel identified potential air in system piping and a pressure transient that occurs on HPCI suction

swap-over testing, Exelon personnel did not fully evaluate nor resolve the adverse HPCI and RCIC interaction prior to the April 2004 RCIC turbine trip.

Enforcement:

Technical Specification 6.8.1 requires, in part, that written procedures shall be established, implemented, and maintained covering the applicable procedures as recommended in NRC Regulatory Guide (RG) 1.33, Appendix A, February 1978. NRC Regulatory Guide 1.33, Appendix A, Section 4.0, includes procedures for performing fill and vent operations for safety-related systems such as HPCI and RCIC.

Contrary to the above, Exelon procedures S55.3.A, "HPCI Fill and Vent," and S49.3.A "RCIC Fill and Vent," established per RG 1.33 were inadequate, in that, the procedures did not maintain adequate steps to ensure appropriate venting of air in HPCI and RCIC system piping. Specifically, the HPCI fill and vent procedure never utilized an installed vent on the HPCI suction line from the suppression pool. The RCIC fill and vent procedure did not establish steps to vent trapped air in the abandoned steam condensing mode piping connected to the RCIC pump suction piping. Because this violation is of very low safety significance and Exelon entered this finding into their corrective action program (CR 220816), this violation is being treated as a non-cited violation (NCV), consistent with Section VI.A of the NRC Enforcement Policy: **NCV 05000352/2004005001, Inadequate procedures to ensure proper venting of air from RCIC/HPCI systems following drain and fill operations.**

4. Radioactive Material Processing and Transportation Corrective Action Review

e. Inspection Scope

The inspectors reviewed the 2003 Annual Radioactive Effluent Release Report, sixteen (16) Issue Reports, three (3) Nuclear Oversight Audit Reports, a Nuclear Oversight field observation, and a relevant Radiation Protection Department self-assessment relating to radioactive waste/material control and shipment. Through this review, the inspectors assessed the licensee's threshold for identifying problems, and the promptness and effectiveness of the resulting corrective actions. This review was conducted against the criteria contained in 10 CFR 20.11 ©), Technical Specifications, and Limerick's procedures.

f. Findings

No findings of significance were identified.

4OA3 Event Followup (71153 - 1 sample)

1. (Closed) LER 05000352; 353/2004-001-00, Unplanned Potential Inoperability of RCIC and HPCI Due to Air In Suction Lines

a. Inspection Scope

On April 20, 2004, during HPCI surveillance testing that involved HPCI pump suction transfer from the condensate storage tank to the suppression pool, a RCIC turbine trip occurred. Exelon's investigation determined several sources of trapped air in the HPCI and RCIC suction piping network that were associated with deficient procedures. The issues with the inadequate procedures is documented in this NRC inspection report, section 4OA2. The LER was reviewed by the inspectors and no additional findings of significance were identified. Exelon documented this event and their corrective actions in CR 220816. This LER is closed.

b. Finding

No findings of significance were identified.

4OA6 Meetings, Including Exit

Exit Meetings

On January 7, 2005, the resident inspectors presented the inspection results to Mr. DeGregorio and other members of his staff, who acknowledged the findings. The inspectors confirmed that proprietary information was not provided or examined during the inspection.

ATTACHMENT: SUPPLEMENTAL INFORMATION

SUPPLEMENTAL INFORMATION

KEY POINTS OF CONTACT

Exelon Generation Company

E. Callan, Director - Engineering
B. Hanson, Plant Manager
L. Harding, Regulatory Compliance
K. Kemper, Manager Regulatory Assurance
C. Mudrick, Director - Operations
P. Orphanos, Shift Operations Superintendent
J. White, Director of Training

LIST OF ITEMS OPENED, CLOSED, AND DISCUSSED

Opened and Closed

05000352/2004005-01	NCV	Inadequate procedures to ensure proper venting of air from RCIC/HPCI systems following drain and fill operations.

Closed

05000352;353/2004-001-0	LER	Unplanned Potential Inoperability of RCIC and HPCI Due to Air In Suction Lines

LIST OF DOCUMENTS REVIEWED

1R02: Evaluation of Changes, Tests, or Experiments

50.59 Evaluations

LG2001E001, Performance of Refueling Operations in Which Fuel Assemblies are Removed from the Core with Control Rods Withdrawn (ECR 01-00323)
LG2001E004, Revise MOV Program Scope (ECR 00-01419)
LG2001E006, ESW D/G Supply Valve Replacement (ECR 01-00907, Mod P-00874)
LG2002E001, D/G Fuel Oil Storage Tank Vaults Drain (ECR 01-01267)
LG2002E002, Revise UFSAR/DBDs - Operation with TCV/TSV Closed (ECR 02-00292)
LG2003E003, GE-SIL 636 Non-Conservative DH Calculations (ECR 01-01233)
LG2003E004, DC MOV Marginal Improvement HV-55-1F42 (ECR 02-00731)
LG2004E001, Vendor Analysis - DC MOVs in Station Documents (ECR LG03-00295)
LG2004E004, Use of Spray Pond Spray Networks & RHRSW for Pond Cooling and Chemistry Control (ECR 04-00264)

50.59 Screens

LG2001E004, Changes to NRC GL 89-10 and IST Program for MOV's
LG2002S143, High Pressure Coolant Injection Valve Test
LG2002S162, RPV Level Setpoint Setdown Feature Unavailable - Reactor Low Level (OT-100, Revision 23; Bases, Revision 22)
LG2002S207, Secondary Containment Control (Unit 2 T-103, Revision 11)
LG2002S219, Eliminate Flange Set in Standby Liquid Control System Common Pump Discharge Pipe Header
LG2002S221, Steam/Water Hammer on 20-T522
LG2003S016, Emergency Service Water Heat Load Calculation Update
LG2003S044, Changes to the Plant Specific Technical Guidelines to Reflect the Impact on TRIP/SAMP Calculations as a Result of Fuel Load for Unit 2 Cycle 8
LG2003S116, Setpoint Change LSHH-4-114C, 16C Feedwater Heater
LG2003S119, Emergency Diesel Generator Dual Temperature Indication Replace w/ ARI
LG2003S120, Residual Heat Removal Room Cooler - Emergency Service Water Min Flow
LG2003S130, Pressure Safety Valve Removal from Scram Air Header
LG2004S012, Emergency Diesel Generator #D11 Outboard Brg Shaft Nonconformance
LG2004S013, Document Changes for Increased Load of the Control Enclosure Chillers
LG2004S031, Operation of 1B Residual Heat Removal/Shutdown Cooling Parallel with Dual Loop Reactor (SP-212)
LG2004S054, Resolution of Thermal Limit Violations (GP-14, Revision 6)

Issue Reports (* indicates the IR was initiated due to NRC inspection-related activities)

114302	131294	162368	183656	208626	246708	273640*	274379*	274688*
115684	131785	162817	196200	209659	247422	273914*	274402*	274734*
116280	139642	163115	202391	217110	248403	274259*	274434*	274767*
116939	141546	172350	208333	221740	249698	274269*	274518*	274795*
128683	142874	177123	208537	242816	273601*	274298*	274587*	

Section1R04: Equipment Alignment

Complete System Walkdown (71111.04S)

LGS 101, Rev. 1,"PRA Model - Importance and Basic Event File: RCIC"
1S49.1.A, Rev. 15,"Valve Alignment to assure availability of RCIC System"
S49.1.A, Rev.18,"Normal RCIC Line-up for Auto Operation"
L-S-39, Rev. 11,"RCIC System Design Basis Document"
UFSAR 5.4.6, "RCIC System"
DWG 8031—49, Rev. 51
DWG 8031—50, Rev. 35

Section 1R12: Maintenance Effectiveness

Condition Reports

173389
227599
234366
272349
281493

Action Requests

A1491664
A1414677

Maintenance Rule Basis Documents

Emergency Service Water

Systems Health Reports

Emergency Service Water

Section 1R17: Permanent Plant Modifications

Procedures and Program Documents

AD-AA-101, Processing of Procedures and T&RMs, Revision 14
CC-AA-10, Configuration Control Process Description, Revision 4
CC-AA-102, Design Input and Configuration Change Impact Screening, Revision 7
CC-AA-103, Configuration Change Control, Revision 8
CC-AA-103-1004, Design Considerations for Digital Upgrades, Revision 1
CC-AA-103-101, Engineering Technical Evaluations, Revision 6
CC-AA-112, Temporary Configuration Changes, Revision 8
CC-AA-20, Configuration Management, Revision 0
CC-AA-309-101, Engineering Technical Evaluations, Revision 6
CC-MA-102-1001, Design Inputs and Impact Screening - Implementation, Revision 3
CC-MA-103-1001, Implementation of Configuration Changes, Revision 5
HU-AA-102, Technical Human Performance Practices, Revision 0
HU-AA-1212, Technical Task Risk/Rigor Assessment, Pre-Job Brief, Independent Third Party Review, and Post-Job Brief, Revision 0
LS-AA-104, Exelon 50.59 Review Process, Revision 4
LS-AA-104-1000, Exelon 50.59 Resource Manual, Revision 1
LS-AA-120, Issue Identification and Screening Process, Revision 2
LS-AA-125, Corrective Action Program (CAP) Procedure, Revision 8
—400-011, Velan Pressure Seal Swing Check Valve Maintenance, Revision 6

MAT-P00662.A-2, Reactor Feed Pump Turbine Speed Control System Modification Test: Outage (for Pump 2B), Revision 0
MAT-P00662.B-2, Unit 2 Reactor Feed Pump Turbine Speed Control System Modification Test: Power Ascension, Revision 0
MAT-P00988.A-1, Feedwater Level Control System Replacement Modification Test: Outage, Revision 1
MAT-P00988.B-1, Feedwater Level Control System Replacement Modification Test: Power Ascension, Revision 1
N-00E-314-00036, Qualification Test Report for STS 535 Single Loop Process Controller, Revision 2
NE-314, Specification for Single Loop Process Controller, Revision 0
NE-CG-931, Fuse & MCCB Design Guide, Revision 4
NE-CG-936, Applications Guideline for Digital Upgrades, Revision 3
RT-1-012-390-0, RHR Heat Exchanger Heat Transfer Computation, Revision 4, dated February 10, 2004
RT-2-012-391-2, RHR Heat Exchanger Heat Transfer Test, Revision 4, dated February 5, 2004
S06.0.E U/1, Unit 1 - Feedwater Level Control and Reactor Feed Pump Control System Manipulation, Revision 6
SM-AA-300, Procurement Engineering Support Activities, Revision 0
SM-AA-300-1001, Procurement Engineering Process and Responsibilities, Revision 5
SP-212, Operation of 1B RDR-SDC in Parallel with Dual Loop Reactor Recirculation, Revision 0
ST-6-055-200-1(2), HPCI Valve Test, Revision 51(34)
ST-6-055-760-1, HPCI Injection to FW Check Valve Operability Test, Revision 7

Modifications

ECR 99-02286-000, Modification P00662 Unit 2 Reactor Feedwater Pump Turbine Controls Replacement (Woodward Governor): Engineering Documents
ECR 00-00353-000, Evaluate Graphite Pressure Seal for Reactor Water Clean-Up Pump Suction Valves
ECR 02-00379-000, Love Controls Replacement for Control Room Chilled Water (including Basis Evaluation ECR 02-00032, Love Controls Replacement Project)
ECR 02-00731-000, DC MOV Margin Improvement for HV-055-*F042 (including Basis Evaluation ECR 03-0000295, Analysis of DC MOV's for NRC RIS2001-15)
ECR 03-00085-001, Modification P00988 Unit 1 Feedwater Level Control System Replacement: Engineering Documents
ECR 03-00174-001, PV-C-007-153 Operation Unsatisfactory After ECR 00-01645 Installation
ECR 03-00662-000, Graphite Pressure Seal Gasket F/Velan 8" Pressure Seal Valves
ECR 04-00155-000, ECR to Support Fuse Size Change for Intermediate/Source Range Monitor Drive Motors

Drawings

E-2717, Sheet J, Class 1E Gate and Globe 250V MOV, Revision 0
E-2717, Sheet C, Class 1E Gate and Globe 250V MOV, Revision 19
E-968, Sheet 242, Electrical Penetration Conductor Index, Revision 1
—049, Reactor Core Isolation Cooling, Revision 51

—050, Reactor Core Isolation Cooling, Revision 35
—051, Sheet 4, Residual Heat Removal, Revision 64
—051, Sheet 2, Residual Heat Removal, Revision 63
—055, High Pressure Coolant Injection, Revision 53
—056, High Pressure Coolant Injection, Revision 39
M-1-E41-1040-E-001, Sheet 1, Typical MOV Limit Switch Development, Revision 67
M-1-E41-1040-E-014, Sheet 2, Unit 1 E41-F071 Valve Schematic Diagram, Revision 1
M-1-E41-1040-E-028, Sheet 2, Unit 2 E41-F071 Valve Schematic Diagram, Revision 0

Miscellaneous Documents

6900 E23, 208/120VAC Circuit Breaker Coordination, Revision 3
6900 E14, Electrical Penetration Time Current Characteristic Curves, Revision 9
A1371708-E01, Acceptance Test Criteria for ECR 02-00379
A1371708-E15, ECR 02-00379 New Component Planned Maintenance
Assessment of Configuration Change Interface Reviews, conducted July 22-25, 2003
Audit #NOSA-LG-03-05, Nuclear Oversight Engineering Design Control Audit, conducted September 2-12, 2003
C0204135, Acceptance Test & Post Modification Test for STS 535 Replacement Controllers
C0204371, Installation of STS 535 Controllers
Calculation 2001-17560, Evaluation of the Temporary Placement of Lead Shielding on the RHR Lines Near Valves HV-1F041 A & C, Revision 0
E11-B001-K-001, RHR Heat Exchanger Vendor Manual, Revision 0
Focus Area Self-Assessment of Configuration Control - Permanent Plant Modifications / 50.59 Reviews, AR# 195675, Revision 1, conducted September 8 - October 22, 2004
Instructional Guide for HU-AA-1212, Technical Task Risk/Rigor Assessment, Pre-Job Brief, Independent Third Party Review, and Post-Job Brief, Revision 0
Instructional Guide for HU-AA-102, Technical Human Performance Practices, Revision 0
Limerick Generating Station Updated Final Safety Analysis Report, Revision 11
List of Qualified 50.59 Screeners & Evaluators as of November 16, 2004
LM-0638, Tube Plugging Limits and Fouling Factors for RHR Heat Exchangers, Revision 0
Maintenance Work Order R-0898745, Disassemble and Inspect Manual Check Valve
NEI 97-04 Appendix B, Guidance & Examples for 10CFR 50.2 Design Basis, Revised November 2000
NEI 96-07, Guidelines for 10CFR50.59 Implementation, Revision 1
PEP #I0012467, Mod P00874-2 50.59 Review Bases is Inconsistent with Modification Design
PEP #I0012698, NSRB Concern about 50.59 Evaluation Adequacy - Mod P00874
RG 1.187, Guidance for Implementation of 10CFR50.59, Changes, Tests, and Experiments, November 2000
Technical Evaluation A1464946-E02, Addition & Adjustment of Dampening Cards to RCIC
Unit 1 & Unit 2 Technical Specifications

Section 1EP4: Emergency Action Level (EAL) and Emergency Plan Changes

Exelon Standard Emergency Plan and Implementing Procedures
Limerick Annex Emergency Plant

Section 2PS2: Radioactive Material Processing and Transportation

Procedures:

RW-AA-100, Rev 2	Process Control Program for Radioactive Wastes
RP-AA-600, Rev 0	RADIOACTIVE Material/Waste Shipments
RP-AA-605, Rev 0	10CFR 61 PROGRAM
RP-AA-600-1001, Rev 1	Exclusive Use and Emergency Response Information
RP-AA-600-1002, Rev 1	Highway Route Controlled Quantity Advance Notification for Radoactive/Waste Shipments
RP-AA-600-1003, Rev 2	Radioactive Waste Shipments to BARNWELL and the DEFENSE CONSOLIDATION FACILITY
RP-AA-600-1004, Rev 2	Radioactive Waste Shipments to ENVIROCARE
RP-AA-600-1005, Rev 3	Radioactive Material and Non-Disposal Site Waste Shipments
RP-AA-600-1006, Rev 1	Notification Requirements for Radioactive Waste Shipments Greater Than Ten Times the Minimum Quantity of Concern
RP-AA-600-1007, Rev 0	Radioactive Waste Shipments to ENVIROCARE BULK WASTE FACILITY
RP-AA-601, Rev 4	Surveying Radioactive Material Shipments
RP-LG-601, Rev 3	Surveying Radioactive Material Shipments at LIMERICK
RP-AA-602, Rev 8	Packaging of Radioactive Material Shipments
RP-AA-602-1001, Rev 4	Packaging of Radioactive Material/Waste Shipments
RP-AA-603, Rev 3	Inspection and Loading of Radioactive Material Shipments
RP-AA-603-1001, Rev 1	Inspection and Loading of Radioactive Material/Waste Shipments
TQ-AA-126, Rev 3	Radioactive Material Shipping Training

Nuclear Oversight Audits:

Nuclear Oversight Corporate Comparative Audit Report, 2004, Chemistry, RadWaste, and Process Control Program
Audit No. NOSA-LIM-04-04 (AR 214019), Chemistry, RadWaste and Process Control Program
Supplemental Report Audit No. NOSA-LIM-04-04 (AR 214019), Chemistry, RadWaste and Process Control Program
Nuclear Oversight Field Observation No. 152171

Shipping Manifests:

Shipment No. MW-03-010, Dewatered Resin, LSA-II, Type A
Shipment No. MW-03-017, Dewatered Resin, LSA-II, Type B
Shipment No. MW-03-022, Dewatered Resin, LSA-II, Type A
Shipment No. MW-04-012, Dewatered Resin, LSA-II, Type B
Shipment No. MW-04-015, Dewatered Resin, LSA-II, Type A

Condition Reports:

00252935, 00251912, 00249937, 00248214, 00241029, 00236797, 00233841, 00219435, 00219432, 00219336, 00214353, 00167332, 00154389, 00264758, 00216653, 00239344

Miscellaneous Documents:

Process Control Program
2003 Limerick Annual Radioactive Effluent Release Report
Focus Area Self-Assessment Report (No. 195662), Radioactive Material Processing and Transportation
Radwaste/Transportation Training Records for selected personnel

Section 4OA1: Performance Indicator Verification

Reactor Safety Indicators

Units 1 & 2 Control Room Logs
NDAP-QA-0737, "Regulatory Performance Assessment"
Technical Specification 3.4.3, "Reactor Coolant System Leakage"
ST-6-107-596-1, "Drywell Floor Drain Sump/Equipment Drain Tank Surveillance Log"
Technical Specification 3.4.5, "Reactor Coolant Dose Equivalent Iodine-131"
Units 1 & 2 Licensee Event Reports

RETS/ODCM Radiological Effluent Occurrences

Monthly projected dose assessment results due to radioactive liquid and gaseous effluent releases;
Quarterly projected dose assessment results due to radioactive liquid and gaseous effluent releases
Dose assessment procedures.

LIST OF ACRONYMS

AR	Action Request
CR	Condition Report
EAL	Emergency Action Level
EDG	Emergency Diesel Generator
EP	Emergency Preparedness
HPCI	High Pressure Coolant Injection
IR	Issue Report (Exelon corrective action document)
LGS	Limerick Generating Station
NCV	Non-cited Violation
NEI	Nuclear Energy Institute
NRC	Nuclear Regulatory Commission
PI	Performance Indicator

RCIC	Reactor Core Isolation Cooling
RHR	Residual Heat Removal
RSPS	Risk Significant Planning Standard
SDP	Significance Determination Process
SSC	System, Structure, or Component
TS	Technical Specifications
UFSAR	Updated Final Safety Analysis Report