July 20, 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 05000352/2005003, 05000353/2005003

Dear Mr. Crane:

On June 30, 2005, 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 July 13, 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 two findings of very low safety significance (Green). These findings were determined to involve violations of NRC requirements. However, because of their very low safety significance and because they were entered into your corrective action program, the NRC is treating these issues as non-cited violations (NCVs), in accordance with Section VI.A of the NRC's Enforcement Policy. If you contest the NCVs 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, D.C. 20555-0001; with copies to the Regional Administrator 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 05000352/2005003, 05000353/2005003
w/Attachment: Supplemental Information

cc w/encl:
Chief Operating Officer, Exelon Generation Company, LLC
Site Vice President - Limerick Generating Station
Plant Manager, Limerick Generating Station
Regulatory Assurance Manager - Limerick
Senior Vice President - Nuclear Services
Vice President - Mid-Atlantic Operations
Vice President - Operations Support
Vice President - Licensing and Regulatory Affairs
Director - Licensing and Regulatory Affairs, Exelon Generation Company, LLC
Manager, Licensing - Limerick Generating Station
Vice President, General Counsel and Secretary
Associate General Counsel, Exelon Generation Company
Correspondence Control Desk
J. Johnsrud, National Energy Committee
Chairman, Board of Supervisors of Limerick Township
R. Janati, Chief, Division of Nuclear Safety, Pennsylvania Bureau of Radiation Protection
J. Bradley Fewell, Assistant General Counsel, Exelon Nuclear
D. Allard, Director, Dept. of Environmental Protection, Bureau of Radiation Protection (SLO)

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S. Collins, RA
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D. Roberts, NRR
T. Tate, PM, NRR
G. Wunder, PM, NRR (Backup)
M. Shanbaky, DRP
A. Burritt, DRP
S. Hansell, DRP - Senior Resident Inspector
C. Colantoni, DRP - Resident Inspector
T. Haverkamp - Resident OA
Region I Docket Room (with concurrences)
ROPreports@nrc.gov (All IRs)

SISP Review Complete: ___SLH_____ (Reviewer's Initials)

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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: 05000352/2005003 and 05000353/2005003

Licensee: Exelon Generation Company, LLC

Facility: Limerick Generating Station, Units 1 & 2

Location: Evergreen and Sanatoga Roads
Sanatoga, PA 19464

Dates: April 1, 2005 through June 30, 2005

Inspectors: S. Hansell, Senior Resident Inspector
G. Bowman, Resident Inspector
C. Colantoni, Resident Inspector
M. Ferdas, Hope Creek Resident Inspector
N. McNamara, EP Inspector
T. Moslak, Health Physicist

Approved by: Mohamed Shanbaky, Chief
Projects Branch 4
Division of Reactor Projects

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SUMMARY OF FINDINGS

IR 05000352/2005-003, IR 05000353/2005-003; 04/01/2005 - 06/30/2005; Limerick Generating Station, Units 1 and 2; Identification and Resolution of Problems and Flood Protection Measures.

The report covered a 3-month period of inspection by resident inspectors and announced inspections by a Health Physicist and an EP Inspector. Two Green non-cited violations (NCVs) were 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: Barrier Integrity

Green. The NRC identified a Green NCV of 10 CFR 50, Appendix B, Criterion XVI, "Corrective Action," because Limerick's staff did not promptly identify and correct a condition adverse to quality associated with failure of a remote shutdown panel switch during surveillance testing. Limerick replaced the defective remote shutdown panel hand switch and performed a satisfactory post maintenance test.

This finding is greater than minor because it was associated with the Barrier Integrity cornerstone attribute of Barrier Performance, and affected the cornerstone objective of ensuring the availability and reliability of components used for containment isolation. This finding is of very low safety significance because it did not represent a degradation of the radiological barrier provided by the control room, spent fuel pool, or standby gas treatment system, did not represent a degradation of the barrier function of the control room against smoke or a toxic atmosphere, and did not represent an actual open pathway from the containment or an actual reduction in defense-in-depth for atmospheric pressure control or hydrogen control.

The inspectors identified that a contributing cause of the finding is related to the problem evaluation subcategory of the Problem Identification and Resolution cross-cutting area, in that Limerick staff did not adequately assess and correct the cause of a December 2004 remote shutdown panel switch failure. (Section 4AO2)

Cornerstone: Mitigating Systems

Green. The NRC identified a Green NCV of Technical Specification 6.8.1, "Administrative Controls - Procedures," because Exelon did not maintain adequate procedures in that T-103, "Secondary Containment Control," contained an inappropriately high maximum safe operating flooding level for the Unit 1 reactor core

isolation cooling (RCIC) room. Limerick revised the T-103 RCIC maximum safe operating flood level from 42 inches to a value of 27 inches.

This finding is more than minor because it affected the Mitigating Systems cornerstone objective of ensuring availability, reliability, and capability of the RCIC system. This finding is of very low safety significance because it did not represent a loss of safety system function, an actual loss of safety function of a single train for greater than its Technical Specification allowed outage time, or a total loss of any safety function that contributes to external event initiated core damage sequences. (1R06)

Cornerstone: Public Radiation Safety

No findings of significance were identified.

Cornerstone: Emergency Preparedness

No findings of significance were identified.

B. Licensee-Identified Violations.

None.

REPORT DETAILS

Summary of Plant Status

Unit 1 began this inspection period operating at 100% rated thermal power. On May 20, 2005, reactor power was reduced to 58% to perform summer readiness maintenance. On May 22, reactor power was restored to 100%. Unit 1 remained at or near 100% reactor power except for brief periods of planned testing.

Unit 2 began this inspection period operating at 100% rated thermal power. On May 7, 2005, reactor power was reduced to 30% to repair the "2B" reactor recirculation motor generator tachometer generator. On May 8, reactor power was restored to 100%. On May 31, 2005, reactor power increased to 106%, for 45 seconds, due to an unexpected increase in the "2A" reactor recirculation pump speed. In response to the "2A" pump speed increase, operators reduced reactor power to 92%. On June 1, reactor power was restored to 100%. Unit 2 remained at or near 100% reactor power except for brief periods of planned testing.

1. REACTOR SAFETY
Cornerstones: Initiating Events, Mitigating Systems, Barrier Integrity

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 walkdowns included the following systems:

- Unit 1 B/D residual heat removal (RHR) with Unit 1 A/C RHR out-of-service for planned maintenance
- D21, D23, D12, D14 emergency diesel generator (EDG) walkdown after automatic start due to loss of one offsite electrical power supply
- Unit 1 reactor core isolation cooling (RCIC)

Complete System Walkdown. (71111.04S - 1 sample) The inspectors performed a complete system walkdown on the Unit 1 control rod drive 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 operating procedures, the system piping and instrumentation diagram, and updated final safety analysis report. The inspectors reviewed outstanding maintenance activities and issue reports associated with the control rod drive system to determine if they would adversely affect system operability. The inspectors verified in the control room and in the control rod drive system rooms

that valves, including locked 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 (71111.05Q - 9 samples)

a. Inspection Scope

Tour Plant Areas Important to Reactor Safety. 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 Updated Final Safety Analysis Report (UFSAR). This inspection activity represented nine samples. The following fire areas were inspected:

- Unit 2 high pressure coolant injection room
- Unit 2 division 1, 2, 3, 4 class 1E battery room
- Unit 1 reactor core isolation coolant room
- Unit 1 safeguard system isolation valve area
- Unit 2 residual heat removal and heat exchanger rooms
- Unit 1 air compressor, electrohydraulic control, and main tube lube oil storage tank area
- D22/D24 emergency 4kV switchgear area
- remote shutdown panel room
- refuel floor during spent fuel pool cleanout

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, and other flood protection features. The inspectors

verified that adequate procedures were in place to identify and respond to floods. The inspectors verified the adequacy of flood protection measures for the Unit 1 RCIC room. This inspection activity represented one sample.

Documents Reviewed

- Alarm Response Card 116 RCIC, A5, "RCIC Pump Room Flood," Revision 0
- Letter from Bechtel Power Company, Dated October 6, 1987
- Issue Report 348594
- T-103, "Secondary Containment Control," Revision 16
- T-103, "Secondary Containment Control - Bases," Revision 19
- SE-4-1, "Reactor Enclosure Flooding," Revision 6

b. Findings

Introduction. The inspectors identified a Green non-cited violation (NCV) of Technical Specification (TS) 6.8.1, "Administrative Controls - Procedures," because Exelon did not maintain adequate procedures in that T-103, "Secondary Containment Control," contained an inappropriately high maximum safe operating (MSO) flooding level for the Unit 1 Reactor Core Isolation Cooling (RCIC) room.

Description. The bases for T-103, "Secondary Containment Control," describes the MSO level as "the highest value of a parameter at which neither equipment necessary for safe shutdown of the plant will fail nor personnel access necessary for the safe shutdown of the plant will be precluded." Limerick defined the MSO value for flooding of the Unit 1 RCIC room to be 42 inches. Determination of this level was based on a letter from Bechtel Power Company, dated October 6, 1987, which stated that the limiting component in the Unit 1 RCIC room, with regards to rising water level, would be a junction box located at a height of 42 inches.

The inspectors performed a walkdown of the Unit 1 RCIC room to verify that there were no components required for operation of RCIC that were located at a height less than the MSO level. The inspectors found that the electronic governor module (EGM) terminal box, mounted on the end of the RCIC turbine, is located less than the MSO level. This terminal box is not watertight and is necessary for proper operation of the RCIC turbine.

Limerick evaluated the Unit 1 RCIC room MSO value of 42 inches and determined that it was incorrect. Station personnel discovered that the EGM terminal box was the lowest safety-related component in the Unit 1 RCIC compartment and that a new MSO value of 27 inches would be more appropriate. Limerick revised the T-103 emergency operating procedure to reflect this change. Additionally, Limerick is in the process of performing an extent of condition review on the other Unit 1 and Unit 2 emergency core cooling system (ECCS) rooms. Station personnel documented these items in issue report (IR) 348594.

Analysis. This finding is a performance deficiency because Limerick did not designate an appropriate maximum safe operating flooding level for the Unit 1 RCIC room in T-103, "Secondary Containment Control." Traditional enforcement does not apply because the issue did not have any actual safety consequences or potential for impacting the NRCs regulatory function and was not the result of any willful violation of NRC requirements or Exelon procedures.

This finding was greater than minor because it affected the Mitigating Systems cornerstone objective of ensuring availability, reliability, and capability of the RCIC system. This finding was evaluated using Phase 1 of Inspection Manual Chapter 0609, Appendix A, "Significance Determination of Reactor Inspection Findings for At-Power Situations." This finding is of very low safety significance because it did not represent a loss of safety system function or an actual loss of safety function of a single train for greater than its technical specification allowed outage time. **This finding also does not involve the total loss of any safety function that contributes to external event initiated core damage accident sequences.**

Enforcement. Technical specification 6.8.1 states, 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 6.0 includes procedures for combating emergencies and other significant events, including flooding.

Contrary to the above, emergency operating procedure T-103, "Secondary Containment Control," was inadequate in that it delineated an incorrect value for the Unit 1 RCIC room maximum safe operating level for flooding. Specifically, the value described in T-103 for the Unit 1 RCIC room was 42 inches. Water at this height in the RCIC room would cover the EGM terminal box for the RCIC turbine and could compromise the proper operation of the RCIC system.

Because this finding is of very low safety significance and Exelon has entered this finding into their corrective action program (IR 348594), this violation is being treated as a non-cited violation (NCV) consistent with Section VI.A of the NRC Enforcement Policy **(NCV 05000352/2005003001, Inadequate emergency operating procedure for the reactor core isolation cooling system maximum safe operating water level in the pump room).**

1R07 Heat Sink Performance (71111.07A - 1 sample)

a. Inspection Scope

The inspectors reviewed the results of Exelon's inspection on the 2B RHR heat exchanger to ensure the heat exchanger could perform its design function. The inspectors reviewed the visual inspection, cleaning and eddy current testing results which were performed during refueling outage 2R08 (March 2005). The inspectors compared the inspection data to the established criteria to verify that the results were

acceptable and that operation was consistent with design. The inspectors reviewed Exelon's basis for the maximum allowed number of plugged tubes on the 2B RHR heat exchanger; and ensured the 2B RHR heat exchanger was maintained below its maximum allowed tube plugging limit. The inspectors walked down the selected heat exchanger to assess its material condition. This inspection activity represented one sample. The documents included in this review are listed in the Attachment.

b. Findings

No findings of significance were identified.

1R11 Licensed Operator Requalification (71111.11 - 1 sample)

1. Simulator Evaluation

a. Inspection Scope

On May 31, 2005, the inspectors observed oscillation power range monitor (OPRM) simulator scenarios 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 following procedures:

- Licensed Operator Requalification lesson plan LLOR 0503D, "Oscillation Power Range Monitor System Activation"
- OT-112, "Recirculation Pump Trip"
- GP-3, "Normal Plant Shutdown"
- GP-5, "Steady State Operations"

b. Findings

No findings of significance were identified.

1R12 Maintenance Effectiveness (71111.12 - 2 samples)

a. Inspection Scope

The inspectors reviewed the performance history on a selected system, structure, or component (SSC) and evaluated the follow-up actions for a selected SSC to assess the effectiveness of Exelon's maintenance activities. The inspectors reviewed Exelon's problem identification and resolution actions, as applicable , for the selected SSCs 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. This inspection activity represented two samples. The documents reviewed are listed in the Attachment. The following SSCs were reviewed:

- erratic position indication (LIC-006-220) reactor feed pump bypass valve
- Unit 2 high pressure coolant injection (HPCI) system

b. Findings

No findings of significance were identified.

1R13 Maintenance Risk Assessments and Emergent Work Evaluation (71111.13 - 6 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 6 samples. The selected maintenance activities included:

- remote shutdown panel safety relief valve surveillance testing
- Unit 2 B recirculation pump speed oscillations
- loss of Unit 2 offsite power feed with D22 emergency diesel generator inoperable for overhaul
- Unit 1 “A” residual heat removal room cooler valve repair after stem separated from disc
- Unit 2 division III inverter troubleshooting
- Unit 2 B1 reactor protection system half scram during surveillance testing, IR# 343697

Documents Reviewed

- Action request A1513069
- IR 328003

- OT-104, “Unexpected/Unexplained Positive or Negative Reactivity Insertion,” Rev. 40
- OT-112, “Recirculation Pump Trip,” Rev. 40
- ST-2-088-322-2, “Remote Shutdown System Safety Relief Valves Operability Test,” Rev. 7

b. Findings

No findings of significance were identified.

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

a. Inspection Scope

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

On May 31, 2005, Unit 2 reactor power increased to 106%, for 45 seconds, due to an unexpected increase in the “2A” reactor recirculation pump speed. In response to the “2A” pump increase, operators reduced reactor power to 92% in accordance with plant procedures. The cause of the “2A” reactor recirculation pump speed increase was a faulty electronic amplifier card. The amplifier card was replaced and Unit 2 was returned to 100% reactor power. This inspection activity represented one sample.

The documents reviewed are listed in the Attachment.

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. 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 condition report documents during these reviews. The documents included in the review are listed in the Attachment. This inspection activity represented five samples. The issues reviewed included:

- Unit 2 B safety relief valve with tell-tale leakage

- emergency service water (ESW) supply pipe with ultrasonic testing indicating less than minimum wall thickness
- Unit 1 A RHR pump with one emergency service water pump inoperable
- Unit 2 reactor core isolation cooling with a compressed snubber on the steam supply line
- D12 emergency diesel generator B1 air compressor did not automatically start when the air bank pressure reached the setpoint, IR #344095

b. Findings

No findings of significance were identified.

1R16 Operator Workarounds (71111.16 - 1 sample)

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. This inspection activity represented one sample.

- Review of erratic position indication (LIC-006-220) on feed pump bypass valve

Documents Reviewed

- Action request A1512784
- IR 326958

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 field 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:

- Unit 1 A reactor enclosure recirculation system (RERS) testing following system outage
- “D21 Diesel Generator Abbreviated Run-In Test”, RT-6-092-315-2, after planned maintenance overhaul
- Unit 2 A electro-hydraulic control (EHC) pump following pump and filter replacement
- residual heat removal pump, valve, and flow test following 2D residual heat removal system outage window
- emergency diesel generator (D13) fast start following fuel oil transfer pump and blower maintenance, ST-6-092-317-1
- Unit 1 reactor core isolation coolant pump test after work to stop turbine oil leaks, ST-6-049-230-1

The inspectors referred to applicable testing procedures and work order documents, including:

- ST-6-076-250-1, “SGTS and RERS Flow Test,” Rev. 38
- Work order R0933717
- Work order R0983354
- S31.5.B, “Replacing Full Flow Filter Elements or Changing/Cleaning EHC Pump Wire Suction Strainer,” Rev. 24
- IRs Nos. 331098 and 331102

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. The documents reviewed are listed in the Attachment. This inspection activity represented five samples. The observed or reviewed surveillance tests included:

- ST-2-088-322-2, “Remote Shutdown System Safety Relief Valves Operability Test,” Rev. 7
- ST-6-055-230-2, “Unit 2 High Pressure Coolant Injection Increased Frequency Test”
- ST-2-088-320-1, “Remote Shutdown System Reactor Core Isolation Cooling Operability Test”
- ST-6-092-112-1, ”D12 Diesel Generator 24-Hour Endurance Test”
- ST-6-049-230-1, “Reactor Core Isolation Cooling Pump, Valve, and Flow Test”

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:

ECR 05-00306, "Temporary Configuration Change Package to Remove Annunciator Window 225 GEN 2 G-1"

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.

Documents Reviewed

- Issue Report 318442
- Action Requests A1509667, A1519252
- CC-AA-112, Revision 10, "Temporary Configuration Changes"
- CC-MA-112-1001, Revision 1, "Temporary Configuration Change Packages"

b. Findings

No findings of significance were identified.

Cornerstone: Emergency Preparedness

1EP4 Emergency Action Level (EAL) and Emergency Plan (E-Plan) Changes (71114-04 - 1 sample)

a. Inspection Scope

During the period of April 1 - June 23, 2005, the NRC received and acknowledged the changes made to Limerick's E-Plan in accordance with 10 CFR 50.54(q), which Exelon Nuclear had determined resulted in no decrease in effectiveness to the Plan and which have concluded to continue to meet the requirements of 10 CFR 50.47(b) and Appendix E to 10 CFR 50. The inspector conducted a sampling review of the Plan changes which could potentially result in a decrease in effectiveness. This review does not constitute an approval of the changes and, as such, the changes are subject to future NRC inspection. 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.

b. Findings

No findings of significance were identified.

1EP6 Drill Evaluation (71114.06 - 1 sample)

a. Inspection Scope

The inspectors evaluated an Emergency Drill, a simulated failure of the reactor to scram, General Emergency Classification on June 7, 2005. The inspectors reviewed the scenarios to identify the timing and location of classification, notification and protective action recommendation (PAR) development activities. During the drill and exercise, the inspectors reviewed checklists and forms used for classification and notification activities, and compared them to the criteria in Exelon's Emergency Plan, EP-AA-1000, and supporting procedures. 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 - 1 sample)

k. Inspection Scope

On May 27, 2005, the inspectors conducted the following activities to verify that a shipment of Type B quantities of radioactive waste shipped, on May 6, 2005, from the site to a burial facility, complied with the requirements of 10 CFR 20, 61, and 71: and Department of Transportation (DOT) regulations 49 CFR 170-189. The inspection was conducted by reviewing relevant documents provided by the license and discussing these records with licensee representatives by telephone. The documents reviewed are listed in the Attachment.

Shipment Records

The inspectors reviewed records associated with the shipment of Type B quantities of radioactive waste, shipped from the site, on May 6, 2005, to a burial site. The shipment was No. MW-05-011. The following aspects of the radioactive waste packaging and shipping activities were reviewed:

- the radio-chemical analytical results for Reactor Water Cleanup (RWCU) resin samples

- the development of scaling factors for hard-to-detect radio-nuclides from the RWCU samples
- characterization and classification of radioactive waste relative to 10 CFR 61.55 and to 49 CFR 173.
- implementation of applicable shipping requirements including proper completion of manifests
- review of the completed Type B cask preparation procedure
- labeling of the shipping container 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.

4. OTHER ACTIVITIES

4OA2 Problem Identification and Resolution

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. Degraded Remote Shutdown Panel Reactor Core Isolation Cooling System Valve Hand Switch (71152 - 1 sample)

a. Inspection Scope

The inspectors reviewed Limerick’s corrective actions for the December 2004 degraded reactor core isolation cooling (RCIC) system suppression pool suction valve hand switch. During surveillance testing, the valve did not stroke from full open to full closed when the hand switch was positioned to “close.” The inspectors reviewed Limerick’s evaluation of the issue, corrective action plan, and documentation of past performance problems during remote shutdown panel switch testing. The inspectors observed a

subsequent test of this valve from the RSP in June 2005, similar to the 2004 test, the valve did not close on the initial attempt.

b. Findings and Observations

Introduction. The inspectors identified a Green non-cited violation (NCV) of 10 CFR 50, Appendix B, Criterion XVI, "Corrective Actions," because Limerick did not take adequate corrective actions following the December 2004 failure of a RSP hand switch.

Description. On December 4, 2004, during TS required surveillance testing of Unit 1 RCIC system components from the RSP, the RCIC suppression pool suction valve did not stroke from full open to full closed when the control switch was positioned to "close." As a result, the RCIC system was declared inoperable from the RSP. Following the test failure, Limerick staff completed some troubleshooting, including inspection of the valve breaker and resistance measurements inside the RSP. Limerick measured the resistance of the contact used to close the valve and found it to be three megaohms. The normal resistance value should read close to zero ohms. Following the resistance measurement, a second attempt was made to close the valve, and it functioned correctly. At that point the valve was declared operable. No actual repairs or corrective actions, other than troubleshooting, were performed.

Limerick entered the failure of the RCIC suppression pool suction valve into the corrective action program, but did not complete a formal root or apparent cause analysis. Over the past five years, Limerick has experienced over 40 surveillance test failures of RSP components. In the majority of cases, these failures were attributable to high contact resistance due to oxidation buildup. Limerick attributed the RCIC suppression pool suction valve failure to contact resistance, as well. However, the inspectors noted that in the past, test failures were the result of resistance readings in the 10 to 20 ohm range, which was inconsistent with the value of three mega ohms obtained during the December 4 test. The inspectors determined that a possible cause for the test failure may have been the result of degradation of the switch, and may not have been addressed by Limerick's corrective actions in December. The inspectors discussed this issue with the Limerick staff on May 24, 2005.

On June 2, 2005, Limerick conducted another RCIC RSP operability test. Again, the RCIC suppression pool suction valve failed to close on demand. Following the second test failure, **Limerick entered the issue into the corrective action program and replaced the hand switch. Limerick staff subsequently stroked the valve successfully.**

Analysis. The inspectors determined that Exelon did not properly evaluate the faulty operation of the RCIC suppression pool suction valve from the RSP in December 2004. While Limerick entered the issue into its corrective action program, no formal causal analysis was performed and corrective actions were ineffective, resulting in recurrence of the problem in June 2005. Traditional enforcement does not apply because the issue did not have any actual safety consequences or potential for impacting the NRC's regulatory function, and was not the result of any willful violation of NRC requirements or Exelon procedures.

This finding is greater than minor because it was associated with the Barrier Integrity cornerstone attribute of Barrier Performance, and affected the cornerstone objective of ensuring the availability and reliability of components used for containment isolation. This finding was evaluated using Phase 1 of Inspection Manual Chapter 0609, Appendix A, "Significance Determination of Reactor Inspection Findings for At-Power Situations." This finding is of very low safety significance because it did not represent a degradation of the radiological barrier provided by for the control room, spent fuel pool, or standby gas treatment system; did not represent a degradation of the barrier function of the control room against smoke or a toxic atmosphere; and did not represent an actual open pathway from the containment or an actual reduction in defense-in-depth for atmospheric pressure control or hydrogen control.

The inspectors identified that a contributing cause of the finding is related to the problem evaluation subcategory of the Problem Identification and Resolution cross-cutting area, in that Limerick staff did not adequately assess the cause of a December 2004 remote shutdown panel hand switch failure.

Enforcement. 10 CFR 50, Appendix B, Criterion XVI, "Corrective Actions," requires that measures be established to assure that conditions adverse to quality, such as failures, malfunctions, deficiencies, deviations, defective material and equipment, and non-conformances are promptly identified and corrected. Contrary to the above, Limerick's corrective actions for the December 2004 failure of the RCIC suppression pool suction valve did not promptly identify and correct the cause of the problem. Because this issue is of very low safety significance and has been entered into Exelon's corrective action program (IR 340394), this violation is being treated as a NCV, consistent with Section VI.A of the NRC Enforcement Policy, issued May 1, 2000 (65FR25368) **(NCV 05000352/2005003002, Inadequate Corrective Actions for a Degraded Remote Shutdown Panel Hand Switch)**.

This inspection activity represented one sample.

3. Annual Sample Review - Remote Shutdown Panel Test Methodology (71152 - 1 sample)

a. Inspection Scope

The inspectors reviewed Limerick's method of conducting Technical Specification (TS) required testing of safety-related components from the remote shutdown panel (RSP). The inspectors identified that Limerick performs this testing either through actual operation of components at the RSP, or by measuring resistance of contacts in the component's control circuit. The inspectors reviewed various test procedures, corrective action documents, observed RSP testing, and discussed corrective actions for past testing issues with station personnel.

b. Findings and Observations

The inspectors identified that Limerick's method of testing safety/relief valves (SRVs) from the RSP did not test contacts used to provide valve open position indication. Limerick tests the operability of the SRVs from the RSP by first transferring SRV control to the RSP. Then, the RSP SRV control circuit is de-energized by removing control power fuses. The SRV control switch is operated, and the resistance of the contact used to energize the SRV solenoid (and open or close the valve) is measured in the open and closed positions. The inspectors determined that this method of testing had a limited scope, because the contacts used to provide valve open position indication were not tested. This issue was discussed with Limerick staff, who entered it into the corrective action program as condition report No. 00329811. The inspectors verified that other indications of SRV position were available to operators from the RSP. The review also included a sample of additional RSP test procedures to verify that similar deficiencies did not exist. No other issues were identified.

4. Semi-Annual PI&R Trend Review

a. Inspection Scope

The inspectors reviewed corrective action reports related to RSP equipment surveillance test problems. The review covered the period of 1996 to the present. The review was performed as part of the semi-annual problem and identification trend review of the Limerick corrective action program. A selected sample of issue reports (IRs), corrective action reports (CRs), and action requests (ARs) were reviewed to determine if the high number of RSP test failures were related to the test method at Limerick. The review was also performed to identify adverse trends related to the corrective action program. The inspectors evaluated the IRs, ARs, CRs, and PEPs against the requirements of LS-AA-125, "Corrective Action Program (CAP) Procedure," and 10 CFR 50, Appendix B, Criterion XVI, "Corrective Action." The issues reviewed in detail were CRs: 285118, 292227, 329416, 329811 and 340394; PEPs: I0005551, I0009939, and I0011354. This inspection activity represented one semi-annual PI&R trend review.

b. Findings

No findings of significance were identified.

4OA3 Event Followup (71153 - 2 samples)

1. Loss of the 201 Safeguard Bus

a. Inspection Scope

On April 6, 2005, Limerick experienced a loss of one of their off-site power sources. This occurred coincident with a planned overhaul of the D22 emergency diesel generator, and resulted in a temporary degradation of main condenser vacuum on Unit 2. The inspectors responded to the site and reviewed recovery actions and operator

response. The cause of the loss of the off-site source was water intrusion into a temperature switch in the 500 kV switchyard, which resulted in isolation of the transformer supplying power to the site. The inspectors reviewed Limerick's corrective actions, extent of condition review, and event risk assessment. The following documents were reviewed by the inspectors:

- E-20, "Loss of Number 20 Transformer Feed," Rev. 11
- ENS 41573
- IR 321903
- Piping and Instrument Diagram E-1, sheet 1, "Single Line Diagram of Station [Electrical Distribution to Safeguards Buses]," Rev. 24
- OT-116, "Loss of Condenser Vacuum," Rev. 27
- Prompt investigation report for loss of the 20 bus offsite source due to 4B transformer lock-out relay operation on false B phase winding high temperature

b. Findings

No findings of significance were identified.

2. LER 05000353/2-05-002-00, Unit 2 High Pressure Coolant Injection (HPCI) Inoperable

a. Inspection Scope

On March 28, 2005, Limerick declared the Unit 2 HPCI system inoperable due to loss of the automatic transfer function on the HPCI outboard suppression pool suction motor-operated valve (MOV). A manufacturing defect in the control power fuse clip for the MOV resulted in loss of control power for this valve. Limerick replaced the degraded fuse clip, successfully stroked the MOV, and restored the HPCI system to operable status. The inspectors reviewed this LER and did not identify any findings of significance. Limerick staff documented this issue in IR 318131. This LER is closed.

b. Findings

No findings of significance were identified.

4OA5 Other

1. TI 2515/163, Operational Readiness of Offsite Power
Cornerstones: Initiating Events, Mitigating Systems

The inspectors performed Temporary Instruction 2515/163, "Operational Readiness of Offsite Power." The inspectors reviewed Exelon's offsite electrical power system procedures and supporting information specifically relating to offsite power operability, the maintenance rule (10 CFR 50.65), and the station blackout rule (10 CFR 50.63). The inspectors reviewed this data against the requirements of 10 CFR 50.63; 10 CFR 50.65; 10 CFR 50 Appendix A General Design Criterion 17, "Electric Power Systems;" and

Limerick Technical Specifications. This information was forwarded to NRR for further review. The documents included in the review are listed in the Attachment.

2. TI 2515/161 - Transportation of Reactor Control Rod Drives in Type A Packages

a. Inspection Scope

This area was inspected to verify that the licensee's radioactive material transportation program complies with specific requirements of 10 CFR 20, 71, and Department of Transportation regulations contained in 49 CFR 173. The inspector interviewed licensee personnel, by telephone, on June 13, 2005, and determined that the licensee had undergone refueling/defueling activities between January 1, 2002 and the present, and had packaged and shipped irradiated control rod drives (CRD) in Department of Transportation Specification 7A Type A packages, during that period.

On June 23, 2005, the inspector interviewed licensee representatives, onsite, and examined records for two CRD shipments (Nos. MM-05-48 and MM-05-49) made on March 28, 2005. The inspector verified that the licensee documentation on file was suitable for making these shipments. The inspector determined that the licensee complied with the specific regulations contained in 49 CFR 173.412 and 173.415 by using a container tested and certified to meet these requirements. The inspector reviewed packaging certification records, documenting the engineering tests performed on the Specification 7A Type A package, and the relevant procedure for preparing the package for shipment. The inspector confirmed that the actual shipment met appropriate criteria including, weight, curie content, dose rate, and closure limitations.

b. Findings

No findings of significance were identified.

4OA6 Meetings, Including Exit

Exit Meetings

On July 13, 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.

On April 14, 2005, Dr. M. Shanbaky, the resident inspectors, and other members of NRC staff conducted a meeting with Mr. R. DeGregorio and other members of Limerick management, to discuss the results of the NRC assessment of Exelon's performance at Limerick Generation Station from January 1 to December 31, 2004. The handouts from the meeting are available electronically from the NRC's document system (ADAMS) under accession number ML051370424. Following the meeting, the NRC staff held a session to accept public comment and respond to public questions.

ATTACHMENT: SUPPLEMENTAL INFORMATION

SUPPLEMENTAL INFORMATION

KEY POINTS OF CONTACT

Exelon Generation Company

N. Harmon, RadWaste Physicist
D. Hart, Technical Support Manager - Radiation Protection
H. Miller, RadWaste Shipper
C. Mudrick, Plant Manager
P. Orphanas, Director - Operations

LIST OF ITEMS OPENED, CLOSED, AND DISCUSSED

Opened and Closed

05000352/2005003-01	NCV	Inadequate emergency operating procedure for the reactor core isolation cooling system maximum safe operating water level in the pump room
05000352/2005003-02	NCV	Inadequate Corrective Actions for a Degraded Remote Shutdown Panel Switch

Closed

05000353/2005002-00	LER	Unit 2 High Pressure Coolant Injection (HPCI) Inoperable

LIST OF DOCUMENTS REVIEWED

Section 1R04: Equipment Alignment

Drawings

Piping and Instrument Diagram —51, sheets 3 and 4, “Residual Heat Removal,” Revisions 62 and 64

Piping and Instrument Diagram —46 & 47, Parts A and B, “Control Rod Drive Hydraulics,”

Procedures

S51.1.A, “Set-Up of RHR System for Automatic Operation in LPCI Mode,” Rev. 31
S51.9.A, “Routine Inspection of the RHR System,” Rev. 9

S46.1.A, “Control Rod Drive Hydraulic System Start Up”
S46.6.A, “Placing Alternate Control Rod Drive Pump In Service”

S46.6.B, “Placing the Alternate Control Rod Drive Hydraulic System Flow Control Valve In Service”
T-219, “Maximizing CRD Cooling Header Flow During ATWS Conditions,” Rev. 2
T-240, “Maximizing CRD Flow After Shutdown During Emergency Conditions,” Rev. 15
Control Rod Drive Issue Reports, Nos. 328450, 328463, 328467, 328474, 328477, and 328478.
LLOT-0070, “Licensed Operator Initial Training for Control Rod Drive Hydraulic System,” Rev. 10

Section 1R07: Heat Sink Performance

Procedures
S12.1.A, “RHR Service Water System Startup,” Rev. 42
S51.8.A, “Suppression Pool Cooling Operation (Startup and Shutdown) and Level Control,” Rev. 36
S51.8.B, “Shutdown Cooling/Reactor Coolant Circulation Operation Startup and Shutdown,” Rev 59

Calculations
LM-0640, “RHR Heat Exchanger Fouling Factor/Tube Plugging Limits for RHRSW Maintenance,” Rev. 0
LM-0638, “Tube Plugging Limits and Fouling Factors for RHR Heat Exchangers,” Rev. 0
LM-505, “Hydraulic Analysis of Operating Modes for Mods P-166, P-167,and P-168,” Rev. 1

Issue Reports/Action Requests

A1268690, A1408341

Miscellaneous

Limerick UFSAR Section 9.2, “Water Systems”
RHRSW System Health Overview Report, dated March 2005
2B RHR Heat Exchanger (2B-E205) Eddy Current Test Results, dated March 14, 2005
2B RHR Heat Exchanger (2BE205) Tube Plugging Chart

Section 1R12: Maintenance Effectiveness

Issue Reports/Action Requests
A1666664, A172130, A209626, A210089, A210215, A236492, A283277, A313603, A314380, A315270

Miscellaneous

Limerick Generating Station Maintenance Rule Scope and Performance Monitoring
System Health Overview Report, dated March 2005, December 2004, June 2004, and December 2003
Plant Health Committee System Presentation, dated March 2005
S06.1.D U/1, Post Scram Level Control

Section 1R14: Personnel Performance During Non-Routine Plant Evolutions

Issue reports/Action Requests

IR 312046

Procedures

ON-122, “Loss of Main Control Room Annunciators,” Rev. 11, 12, and 13
Prompt Investigation Reports
Prompt investigation report for core alterations without SRM audible alarm available

Technical Specifications

Technical Specification (TS) 3.9.2, “Instrumentation”

Section 1R15: Operability Evaluations

IR 214633, IR 317437, IR 320173
Operability determination for PSV-041-2F013B, and supporting calculation
Action request A1510239, A1266707, A1323742
Calculation LM-095, “LGS ESW/RHRSW Inspection Plan,” Rev. 5
NES-MS-03.1, “Piping Minimum Wall Thickness Calculation,” Rev. 2
Drawing EBB-209-2, “Isometric - Reactor Building, Reactor Core Isolation Cooling - Unit 2,” Rev. 12

Section 1R22: Surveillance Testing

IR 279167, IR 340394, A1518267, C0213924
ST-2-088-320-1, Remote Shutdown System Reactor Core Isolation Cooling Operability Test, Completed 12/4/2004

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

Exelon Standard Emergency Plan and Implementing Procedures
Limerick Annex Emergency Plan

Section 2PS2: Radioactive Material Processing and Transportation

Procedures

RP-AA-600-1003, Rev 2, “Radioactive Waste Shipments To Barnwell and the Defense Consolidation Facility”
RP-AA-600-1005, Rev 3, “Radioactive Material and Non-Disposal Site Waste Shipments”
RP-LG-601, Rev 5, “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-603-1001, Rev 1, “Inspection and Loading of Radioactive Material Waste Shipments”
053-004, Rev 6, “CNS-8-120B Transport Cask Operations”

Shipping Manifests

Shipment No. MW-05-011, Mechanical Filters, Type B

Section 4OA5: Other

TI 2515/163, Operational Readiness of Offsite Power

E-5, "Grid Emergency," Rev. 22
OP-AA-108-107-1001, "Station Response to Grid Capacity Questions," Rev. 1
E-10/20, "Loss of Offsite Power," Rev. 36
OP-AA-108-107-1002, "Interface Agreement Between Exelon Energy Delivery and Exelon Generation for Switchyard Operations," Rev. 1
S91.0.B, "Alternate Offsite Source Implementation," Rev. 11
WC-LG-101-1001, "Guideline for the Performance of On-Line Work/ System Outages," Rev. 3
WC-LG-101-1001, "Guideline for the Performance of On-Line Work/ System Outages," Rev. 3
WC-AA-101, "On-Line Work Control Process," Rev. 10
OP-AA-108-107-1001, "Station Response to Grid Capacity Questions," Rev. 1

TI 2515/161 - Transportation of Reactor Control Rod Drives in Type A Packages

Shipping Records for Shipment Nos. MM-05-048 and MM-05-049
Packaging Certification Documentation for Container Products Corporation Specification 7A Type A package
General Electric Nuclear Energy, Parts and Service Operational Procedure 4.2.3, Revision 0, CRDM Shipping, Handling, and Storage.

LIST OF ACRONYMS

AR	Action Request
CAP	Corrective Action Program
CFR	Code of Federal Regulations
CR	Condition Report
CRD	Control Rod Drive
DOT	Department of Transportation
EAL	Emergency Action Level
EDG	Emergency Diesel Generator
EHC	Electro-Hydraulic Control
E-Plan	Emergency Plan
ESW	Emergency Service Water
HPCI	High Pressure Coolant Injection
IR	Issue Report
MOV	Motor Operated Valve
NCV	Non-cited Violation
NRC	Nuclear Regulatory Commission
OPRM	Oscillation Power Range Monitor
PAR	Protective Action Recommendation
RCIC	Reactor Core Isolation Cooling
RERS	Reactor Enclosure Recirculation System
RHR	Residual Heat Removal

RSP	Remote Shutdown Panel
RWCU	Reactor Water Clean-Up
SDP	Significance Determination Process
SRM	Source Range Monitor
SSC	System, Structure, or Component
TS	Technical Specification
UFSAR	Updated Final Safety Analysis Report