October 24, 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 05000352/2005004, 05000353/2005004

Dear Mr. Crane:

On September 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 October 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 one NRC-identified finding of very low safety significance (Green). This finding was determined to involve a violation of an NRC requirement. Additionally, a licensee-identified violation, which was determined to be of very low safety significance, is listed in this report. However, because of the very low safety significance and because it was entered into your corrective action program, the NRC is treating this finding as a non-cited violation (NCV) consistent with Section VI.A.1 of the NRC Enforcement Policy. If you contest the NCV in this report, you should provide a response within 30 days of the date of this inspection report, with the basis for your denial, to the Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington, 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/

James Trapp, Chief
Projects Branch 4
Division of Reactor Projects

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

Enclosure: Inspection Report 05000352/2005004, 05000353/2005004
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
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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: 05000352/2005004 and 05000353/2005004

Licensee: Exelon Generation Company, LLC

Facility: Limerick Generating Station, Units 1 & 2

Location: Evergreen and Sanatoga Roads
Sanatoga, PA 19464

Dates: July 1, 2005 through September 30, 2005

Inspectors: S. Hansell, Senior Resident Inspector
C. Colantoni, Resident Inspector
N. McNamara, Emergency Preparedness Inspector
J. Richmond, Reactor Inspector
D. Werkheiser, Reactor Inspector

Approved by: James Trapp, Chief
Projects Branches 1 and 4
Division of Reactor Projects

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SUMMARY OF FINDINGS

IR 05000352/2005-004, IR 05000353/2005-004; 07/01/2005 - 09/30/2005; Limerick Generating Station, Units 1 and 2; Maintenance Effectiveness

The report covered a 3-month period of inspection by resident inspectors and announced inspections by an emergency preparedness inspector and a reactor inspector. Inspectors identified one Green non-cited violation (NCV). 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. The inspectors identified a non-cited violation of 10 CFR 50.65(b)(2)(i) because Exelon did not scope an emergency service water (ESW) valve open function, used in the emergency operating procedures, into its maintenance rule (MR) monitoring program. Exelon did not demonstrate that the valve's performance was effectively controlled through the conduct of appropriate preventative maintenance such that the valve remained capable of performing its intended function. As a result, Exelon did not perform additional corrective actions to determine the cause and correct the condition when the valve failed to open on demand during the last two valve tests in 2002 and 2004. Exelon added the ESW valve open function into the MR program and entered this deficiency into their corrective action program for resolution (IRs 370575 and 370904).

  This finding affects the Mitigating Systems Cornerstone because equipment performance problems were such that Exelon could not demonstrate effective control of component performance or condition through preventative maintenance. This finding is more than minor because it is similar to Example 7.d of NRC Inspection Manual Chapter (IMC) 0612 Appendix-E, "Examples of Minor Issues." The finding is of very low safety significance because it did not represent an actual loss of safety function for equipment designated as risk significant, and was not risk significant for external initiating events. (Section 1R12)

B. Licensee-Identified Violations.

A violation of very low safety significance, which was identified by Exelon, was reviewed by the inspectors. Corrective actions taken or planned by Exelon were entered into their corrective action program. The violation and corrective action tracking number is listed in Section 4OA7 of this report.

REPORT DETAILS

Summary of Plant Status

Unit 1 began this inspection period at full rated thermal power and operated at full power for the entire report period except for an automatic reactor scram on July 18, 2005. The unit returned to full power operation on July 21, 2005.

Unit 2 began this inspection period at full rated thermal power and operated at full power for the entire report period except for an unplanned power reduction to 73 percent on September 18, 2005. This power reduction resulted from a trip of the 2C condensate pump and subsequent runback of the reactor recirculation water pumps. Unit 2 returned to 100 percent power on September 20, 2005.

1. REACTOR SAFETY

Cornerstones: Initiating Events, Mitigating Systems, and Barrier Integrity

1R01 Adverse Weather Protection (71111.01 - 2 samples)

a. Inspection Scope

Since heavy rains were forecast in the vicinity of the facility for the week of July 3, 2005, the inspectors reviewed the station's overall preparations for the expected weather conditions. On July 5, 2005, the inspectors verified that the station had implemented appropriate procedures and guidance for the predicted heavy rains. The inspectors reviewed the planned maintenance and testing to verify that event mitigation equipment would remain available during the period of inclement weather. The inspectors also reviewed SE-9, Revision 24, "Preparation for Severe Weather," and GP 7.1, Revision 11, "Summer Weather Preparation and Operation."

On July 27, 2005, the inspectors reviewed the adverse effects of abnormally warm weather as they applied to the Unit 1 and Unit 2 condensate systems. The inspectors reviewed GP-5, Revision 120, "Steady State Operations," to ensure that Exelon had implemented the appropriate actions in regards to high condensate temperatures. The above average temperatures resulted in a reduction in Unit 2 reactor power to control condensate temperature below the procedure limit of 140EF.

b. Findings

No findings of significance were identified.

1R04 Equipment Alignment (71111.04)

Partial Walkdown (71111.04Q - 3 samples)

a. Inspection Scope

The inspectors performed a partial walkdown of the following three systems to verify the operability of redundant or diverse trains and components when safety equipment was inoperable. The inspectors attempted to identify any discrepancies that could impact the function of the system, and, therefore, potentially increase risk. The inspectors reviewed applicable operating procedures, walked down control systems components, and verified that selected breakers, valves, and support equipment were in the correct position to support system operation. The inspectors also verified that Exelon had properly identified and resolved equipment mitigation problems that could cause initiating events or impact the capability of mitigating systems or barriers and entered them into the corrective action program. Documents reviewed are listed in the Attachment.

- 20 Regulator Transformer Offsite Electrical Power Supply
- Unit 1 “B” and “D” Core Spray Systems with “A” and “C” Core Spray System Out-of-Service
- Unit 1 High Pressure Coolant Injection System

b. Findings

No findings of significance were identified.

1R05 Fire Protection

Fire Protection - Tours (71111.05Q - 9 samples)

a. Inspection Scope

The inspectors conducted a tour of the areas listed below 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).

- D22 Emergency Diesel Generator Compartment
- 500kV Switchyard Control House
- Auxiliary Equipment Room
- Unit 1 “A” and “C” Core Spray Rooms Following Maintenance
- D14 Emergency Diesel Generator Compartment During Monthly Run
- Unit 1 Reactor Core Isolation Cooling Room #108, 177' Elevation
- Unit 2 Reactor Building Enclosure 283' Elevation; Standby Liquid Control System Hydrogen Recombiner Area

- Unit 1 253' Elevation
- Unit 2 253' Elevation

b. Findings

No findings of significance were identified.

1R11 Licensed Operator Requalification (71111.11 - 1 sample)

Resident Inspector Quarterly Review

a. Inspection Scope

On August 10, 2005, the inspectors reviewed documentation, interviewed Exelon personnel, and observed the activation of a senior reactor operator license to assess licensed operator performance and the activation process. The inspectors also performed the evaluation to determine if Exelon effectively implemented operator license activation requirements established in 10 CFR 55. Documents reviewed included licensee procedures, operator logs, Technical Specifications, and associated Technical Specification change requests. The inspectors discussed the results with operators, operations management, and training instructors. Documents reviewed are listed in the Attachment.

b. Findings

No findings of significance were identified.

1R12 Maintenance Effectiveness (71111.12 - 2 samples)

a. Inspection Scope

The inspectors reviewed the two samples listed below for items such as: (1) appropriate work practices; (2) identifying and addressing common cause failures; (3) scoping in accordance with 10 CFR 50.65(b) of the MR; (4) characterizing reliability issues for performance; (5) trending key parameters for condition monitoring; (6) charging unavailability for performance; (7) classification and reclassification in accordance with 10 CFR 50.65 (a)(1) or (a)(2); and (8) appropriateness of performance criteria for structures, systems, and components (SSCs)/functions classified as (a)(2) and/or appropriateness and adequacy of goals and corrective actions for SSCs/functions classified as (a)(1). Documents reviewed are listed in the Attachment. Items reviewed included the following:

- Units 1 and 2 Emergency Service Water Systems
- Diesel Driven Fire Pump Heat Exchanger Fouling

b. Findings

Introduction: The inspectors identified a Green non-cited violation of 10 CFR 50.65(b)(2)(i) for the failure to scope the emergency service water (ESW) back-up supply to turbine enclosure cooling water (TECW) function into the MR monitoring program.

Description: On a loss of normal service water cooling, ESW can provide back-up cooling to the TECW heat exchangers through three motor operated valves. The valves are normally closed, safety-related, and have a safety design basis to remain closed to prevent ESW inventory loss through the non-safety related service water system. Emergency operating procedures (EOPs), off-normal procedures, and system operating procedures direct control room operators to open these valves under specific conditions to provide alternate cooling to TECW. When opened, the ESW valves allow cooling of reactor feed pump components and the risk significant instrument air system. Instrument air is used to reset a reactor scram after an event and provide a means to vent the primary containment. During a review of ESW issue reports (IRs) for the last two years to assess maintenance effectiveness, the inspectors identified a repeat component problem for HV-011-207. This valve is one of the three valves that must open to provide ESW back-up cooling to Unit 2 TECW.

Exelon functionally tested these ESW valves every two years by a remote position indication inservice surveillance test. Historically, the three Unit 1 valves and the three Unit 2 valves have passed the surveillance test, with the exception of the Unit 1 HV-011-207 valve. During the last two tests, in August 2002 and August 2004, HV-011-207 did not open on the initial attempt. In both instances, the valve's motor operator required higher than normal electrical current. In 2002, the valve's motor control center (MCC) thermal overload did not actuate as designed resulting in damage to MCC components (A1382880). Exelon repaired the MCC and subsequently successfully stroked the valve. In 2004, the valve motor thermal overload opened, de-energizing the valve operator and preventing damage to the MCC (A1481672). Exelon reset the thermal overload and the valve successfully stroked from the MCC. The 2004 corrective action request documented that the valve had been "stuck in the seat."

Exelon did not perform effective follow-up corrective actions to determine the cause of the overload, or prevent recurrence. Station personnel performed a maintenance preventable functional failure (MPFF) determination for each occurrence. In 2002, Exelon determined that no functional failure had occurred because no loss of a single train of the 480 VAC system had occurred. In 2004, Exelon determined that no functional failure had occurred because there was no loss of cooling function to emergency diesels, emergency core cooling system room unit coolers, residual heat removal pump motor oil coolers, or control enclosure cooling water system. Exelon did not evaluate the loss of back-up cooling function to TECW for both problems. The inspectors noted that the associated operability evaluations documented that the valve did not have an active function to open. In addition, recent extent of condition evaluations for ESW system problems, including gate valve stem-disc corrosion and

silting issues, also documented that these valves were required to remain closed, and had no active function to open.

The inspectors concluded that Exelon had multiple opportunities to identify this MR scoping deficiency (i.e., valve's open function). Specifically:

- PEP I0011668, "Some Systems Inappropriately Removed from the MR Program," documented that Exelon reviewed the EOPs to correctly identify systems used and functions associated with each system's usage.
- A1382880, "Feed for HV-011-207 Tripped on Thermals"
- A1481672, "HV-011-207 Failed to Stroke"
- IR 1160221 Apparent Cause Evaluation

After the problem was discovered, Exelon added the ESW valve open function into the MR program and entered this deficiency into their corrective action program for resolution (IRs 370575 and 370904). The Exelon MR expert panel will review the issue at a quarterly meeting and determine the ESW valve performance criteria. The performance criteria will be used to determine if the ESW valve open function will be classified in the a(1) or a(2) category based on valve performance.

Analysis: This finding was a performance deficiency because Exelon did not adequately resolve a repetitive equipment performance problem. This finding affected the Mitigating Systems Cornerstone and was more than minor because, similar to Example 7.d of NRC Inspection Manual Chapter (IMC) 0612 Appendix-E, "Examples of Minor Issues," equipment performance problems were such that effective control of component condition through preventative maintenance could not be demonstrated. Specifically, the ESW cooling water supply valve to the TECW heat exchanger did not stroke open on the initial attempts in August 2002 and August 2004. In both instances, the valve's motor operator demanded higher than normal electrical current and prevented valve movement. Exelon did not perform effective follow-up corrective actions to determine the cause of the overload, or prevent recurrence.

Inspectors determined this finding to have very low safety significance (Green), using NRC IMC 0609 Appendix A, "Determining the Significance of Reactor Inspection Findings for At-Power Situations." This finding did not represent an actual loss of safety function for equipment designated as risk significant per 10 CFR 50.65, and was not risk significant for external initiating events.

Enforcement: 10 CFR 50.65(b)(2)(i) requires, in part, that the scope of the monitoring program specified in paragraph (a)(1) include both safety and non-safety related SSCs that are used in EOPs. Limerick event procedure E-10/20, revision 36, "Loss of Off-Site Power," an EOP implementing procedure, directs operators to establish ESW flow to the TECW heat exchangers.

Contrary to the above, prior to September 7, 2005, Exelon did not scope the open function of HV-011-207, which is to supply back-up cooling to TECW, into the MR

monitoring program. HV-011-207 failed to open on demand during the last two remote position indication surveillance tests (A1382880 and A1481672) conducted in August 2002 and August 2004. Therefore, between August 30, 2002, and September 7, 2005, Exelon did not demonstrate effective control of HV-011-207 performance or condition through appropriate preventative maintenance, such that the valve remained capable of performing its intended function. Because this violation was of very low safety significance and Exelon entered this finding into their corrective action program (IRs 370575 and 370904), this violation is being treated as a non-cited violation (NCV), consistent with Section VI.A of the NRC Enforcement Policy. **(NCV 05000253/2005004-01)**

1R13 Maintenance Risk Assessments and Emergent Work Control (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 performed appropriately. The selected maintenance activities included:

- 20 Regulator Transformer Automatic Tap Changer Loss of Power
- 21 Auxiliary Transformer Unavailable due to Loss of Oil Pump and Cooling Fans with 20 Regulator Transformer Tap Changer in Manual
- ST-6-092-314-1, Flames During D14 Emergency Diesel Generator Monthly Operability Run, IR 356724
- Diesel Driven Fire Pump Failed Post Maintenance Test due to a Heat Exchanger Problem, IR 362498
- Unit 2 Core Spray Low Pressure Alarm Following 2A Core Spray Post Maintenance Testing, A1517520

- Leak Discovered in Room #302 During Reactor Core Isolation Cooling Pump, Valve, and Flow Test, IR 370669

b. Findings

No findings of significance were identified.

1R14 Operator Performance During Non-Routine Plant Evolutions and Events (71111.14 - 2 samples)

a. Inspection Scope

For the non-routine event described below, the inspectors reviewed operator logs, plant computer data, and strip charts to determine what occurred and how the operators responded, and to determine if the response was in accordance with plant procedures.

- On July 21, 2005, Unit 1 shut down automatically due to corroded contacts on the 11 disconnect in addition to DC grounds on balance of plant equipment. The inspectors responded to the control room and observed licensed operators' performance of emergency operating procedures and plant recovery procedures.

- On September 18, 2005, Unit 2 reactor power decreased to 73 percent due to a recirculation pump runback following an overcurrent trip of the 2C condensate pump. The inspectors reviewed applicable procedures to determine if operator response was appropriate. The inspectors also reviewed the repairs to the pump and subsequent recovery actions.

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 requests and condition reports during these reviews. The issues reviewed included:

- "C" and "D" Emergency Service Water Pump Shaft Seal Packing Studs Have Minimal Engagement, IR 350257
- Leak on Residual Heat Removal Service Water Piping, A1524780, IR 356438
- D22 and D24 4kV Bus Voltage Reading Higher than Normal, IR 358323, A1515902
- D14 Diesel Exhaust Line Excessive Fuel Oil Accumulation, IR 356724
- Unit 1 Fuel Zone Reactor Level Recorder Resetting Automatically, A1524629

b. Findings

No findings of significance were identified.

1R16 Operator Workarounds (71111.16 - 2 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.

- Semi-Annual Review of Aggregate Workarounds
- Standby Gas Treatment System Exhaust Fan Damper Position Indication

Documents reviewed are listed in the Attachment.

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 approved procedures. The inspectors assessed test 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 criteria 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. The documents reviewed are listed in the Attachment. The post maintenance test activities reviewed included:

- ST-6-051-234-1, Unit 1 "D" Residual Heat Removal Pump Test After Pump Discharge Check Valve Maintenance

- ST-6-051-233-2, Unit 2 “C” Residual Heat Removal Pump, Valve, and Flow Test After Planned Maintenance
- ST-6-052-231-1, Unit 1 “A” Core Spray Pump Test After Planned Maintenance
- ST-6-011-231-1, Unit 2 Emergency Service Water Check Valve Test After Valve Disk Replacement
- ST-6-012-232-0, “B” Residual Heat Removal Service Water Pump Test After the Pump was Repacked
- ST-6-052-231-2, Unit 2 “A” Loop Core Spray Pump, Valve and Flow Test Following Core Spray Planned Maintenance

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 that 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. The observed or reviewed surveillance tests included:

- ST-6-092-311-2, D21 Emergency Diesel Generator Slow Start Operability Test Run
- ST-2-088-320-2, Unit 2 Remote Shutdown System Reactor Core Isolation Cooling Operability Test
- ST-2-092-324-1, 4kV Emergency D14 Bus Undervoltage Channel and Functional Test
- ST-2-051-413-2, Emergency Core Cooling System Residual Heat Removal Low Pressure Coolant Injection Pump Discharge Pressure Calibration and Functional Test
- ST-6-049-230-1, Reactor Core Isolation Cooling Pump, Valve, and Flow Test

b. Findings

No findings of significance were identified.

Cornerstone: Emergency Preparedness

1EP2 Alert and Notification System (ANS) Testing (71114.02 - 1 sample)

a. Inspection Scope

The inspectors conducted an onsite review of the Limerick ANS to ensure that the system provided for prompt notification of the public for taking protective actions. In addition, the inspectors interviewed the siren program manager and reviewed maintenance and test records for calendar years 2004 and 2005 to determine if test failures were being properly addressed and sirens were routinely maintained. The inspection was conducted in accordance with NRC Inspection Procedure 71114, Attachment 02, and the applicable planning standard, 10 CFR 50.47(b)(5) and its related 10 CFR 50, Appendix E requirements were used as reference criteria. Documents reviewed are listed in the Attachment.

b. Findings

No findings of significance were identified.

1EP3 Emergency Response Organization (ERO) Augmentation (71114.03 - 1 sample)

a. Inspection Scope

The inspector conducted an onsite review of Limerick's ERO augmentation staffing requirements and the process for notifying the ERO to determine the readiness of key staff to respond to an event and facility activation timeliness. The review included an assessment of the backup notification system in case the primary system was unavailable. The inspector reviewed the communication augmentation test records from 2004 and 2005 and the associated corrective action reports. Finally, the emergency plan (E-Plan) qualification records for key ERO positions were reviewed to ensure that the ERO staff qualifications were current. The inspection was conducted in accordance with NRC Inspection Procedure 71114, Attachment 03, and the applicable planning standard, 10 CFR 50.47(b)(2) and its related 10 CFR 50, Appendix E requirements were used as reference criteria. The documents reviewed are listed in the Attachment.

b. Findings

No findings of significance were identified.

1EP4 Emergency Action Level (EAL) and Emergency Plan (E-Plan) Changes (URI 05000352; 05000353/2004004-03) (71114.04)

a. Inspection Scope

During the period of July to September 2005, the NRC has received and acknowledged the changes made to Exelon's E-Plan in accordance with 10 CFR 50.54(q), which

Exelon had determined resulted in no decrease in effectiveness to the E-Plan. The inspectors conducted a sampling review of the E-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. The documents reviewed are listed in the Attachment.

b. Findings

Introduction: NRC requirements state that a range of protective actions be developed which consider both evacuation and sheltering. After a review of several licensees' emergency plans, the NRC staff identified a generic misinterpretation of the regulatory requirement to include sheltering in a licensee's protective action recommendation (PAR) consistent with Federal guidance. During an inspection conducted on August 3-5, 2004, the NRC identified that Exelon had removed the sheltering option from their PAR scheme. Based on the generic misinterpretation, the NRC issued unresolved item No. 05000352;05000353/2004004-03, pending further review of the enforcement aspects of this issue.

Description: The inspector conducted a review of licensee E-Plans, implementing procedures, and notification forms to evaluate to what extent licensees considered sheltering when recommending protective actions to offsite agencies. The review disclosed that licensees were implementing the requirements of 10 CFR 50.47(b)(10), "Emergency Plans," inconsistently. The NRC issued Regulatory Issue Summary (RIS) 2004-13, "Consideration of Sheltering in Licensees' Range of Protective Action Recommendations," to improve licensee's understanding of the regulatory requirements contained in 10 CFR 50.47(b)(10). The NRC followed up with RIS 2004-13, Supplement 1, to further clarify the regulatory requirements and require that licensees' reconsider sheltering as part of their range of protective actions by June 8, 2005. In May 2005, Exelon revised their standardized radiological E-Plan and implementing procedures to include the sheltering option in their PAR scheme which was determined to be in compliance with RIS 2004-13.

Analysis: Based on the NRC's recognition of the need to clarify the requirements, licensee performance prior to June 8, 2005, will not be considered a performance deficiency.

Enforcement: Inspectors identified a violation of 10 CFR 50.47(b)(10). Because the violation was identified and corrected during the discretion period, the NRC is exercising enforcement discretion in accordance with Section VII.B.6 of the NRC's Enforcement Policy and is, therefore, not issuing any enforcement action for this violation.

1EP5 Correction of Emergency Preparedness Weaknesses and Deficiencies (71114.05 - 1 sample)

a. Inspection Scope

The inspector reviewed 2004 and 2005 drill and exercise reports to assess Exelon's capability to be self critical in identifying drill and exercise performance issues. The inspectors reviewed the associated corrective action reports to determine the significance of the issues and whether repeat problems were occurring. The inspector also reviewed Exelon's quality assurance program and associated assessment reports to ensure Exelon was able to independently assess the overall maintenance and effectiveness of the EP program. In addition, the inspector evaluated several 2004 and 2005 focus area self-assessment reports to assess the EP staff's ability to be self-critical for making improvements, avoiding complacency and/or degradation of their EP program. This inspection was conducted according to NRC Inspection Procedure 71114, Attachment 05, and the applicable planning standard, 10 CFR 50.47(b)(14) and its related 10 CFR 50, Appendix E and 10 CFR 50.54(t) requirements were used as reference criteria. The documents reviewed are listed in the Attachment.

b. Findings

No findings of significance were identified.

4. OTHER ACTIVITIES

4OA1 Performance Indicator (PI) Verification (71151 - 3 samples)

a. Inspection Scope

Cornerstone: Emergency Preparedness

The inspector reviewed the Exelon's procedure for developing the data for the EP PIs which are: (1) Drill and Exercise Performance (DEP); (2) ERO Drill Participation; and (3) ANS Reliability. The review covered the period of July 2004 to June 2005. The inspector also reviewed the station's 2004 and 2005 drill and exercise reports, training records and ANS testing data to verify the accuracy of the reported data. The review was conducted in accordance with NRC Inspection Procedure 71151. The acceptance criteria used for the review were 10 CFR 50.9 and NEI 99-02, Revision 1, Regulation Assessment Performance Indicator Guideline. The documents reviewed are listed in the Attachment.

b. Findings

No findings of significance were identified.

4OA2 Problem Identification and Resolution

1. Daily Review

The inspectors reviewed selected IRs as part of the routine baseline inspection documented in this report. The inspectors assessed the IRs to verify whether Limerick adequately identified the full extent of the various issues, performed appropriate evaluations, and identified reasonable corrective actions. 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. Annual Sample Review of ESW Make-up to Spent Fuel Pool (71152 - 1 sample)

a. Inspection Scope

Exelon identified that the emergency service water (ESW) make-up line to the Unit 1 spent fuel pool (SFP) was 80 percent clogged and could not pass rated flow. ESW make-up provided a design basis safety function for SFP cooling in the event of an extended loss of off-site power, through evaporative cooling (UFSAR 9.1.3). The inspectors reviewed Exelon's evaluations and corrective actions for this issue to assess whether problem identification was accurate and complete, operability and reportability requirements were adequate, classification and prioritization of the problem resolution was commensurate with its safety significance, and whether the corrective actions were appropriately focused to correct the problem. The documents reviewed are listed in the Attachment.

b. Findings and Observations

No findings of significance were observed.

The inspectors noted that an operability determination, for spent fuel pool cooling during an extended loss of off-site power event, was timely and thorough in scope, and included a visual inspection of the Unit 2 make-up line prior to the Unit 2 refueling outage. The apparent cause evaluation appeared to be broad based in scope, and contained adequate engineering rigor, with one minor exception. The extent of condition review appeared focused on the deterministic safety design basis of the reviewed components, and did not appear to incorporate risk insights into the evaluation or prioritization of follow-up corrective actions.

4OA3 Event Followup (71153)

1. (Closed) LER 05000352/1-05-002, Loss of Offsite Source

On April 6, 2005, one of two offsite electrical power sources was de-energized due to a false actuation of the 4B transformer protective relays. This resulted in the de-energization of four of the eight 4kV safeguard busses which in turn caused four of eight emergency diesel generators to automatically start and run unloaded as designed. The four alternate offsite supply breakers from the energized offsite source automatically closed as designed and re-energized the affected 4kV safeguard busses. Limerick determined that the cause of this event was water intrusion into the B phase winding high temperature switch. The inspectors reviewed this LER and did not identify any findings of significance. Limerick documented this issue in IR 321903. This LER is closed.

2. (Closed) LER 05000353/2-05-003, Transient Exceeded Licensed Maximum Power Level

On May 31, 2005, Limerick Unit 2 experienced an unplanned reactor power increase to approximately 107 percent of rated thermal power due to a failure of the speed control for the 2A reactor recirculation pump motor generator. Operators immediately reduced reactor power below 100 percent by lowering the speed on the 2B reactor recirculation pump. The cause of the event was a circuit card failure that resulted in the fluid coupler scoop tube moving to the maximum speed mechanical stop. Limerick replaced the failed circuit card and returned the pump speed control to service. The inspectors reviewed this LER and did not identify any findings of significance. Limerick documented this issue in IR 339758. This LER is closed.

4OA5 Other

1. Institute of Nuclear Power Operations (INPO) Plant Assessment Report Review

a. Inspection Scope

The inspectors reviewed the final report for the INPO plant assessment of Limerick Generating Station conducted in February 2005. The inspectors reviewed the report to ensure that issues identified were consistent with NRC perspectives of licensee performance and to verify if any significant safety issues were identified that required further NRC follow-up.

b. Findings

No findings of significance were identified.

4OA6 Meetings, Including Exit

Exit Meetings

On August 4, 2005, the emergency preparedness inspector presented the inspection results to Mr. R. DeGregorio and other members of his staff. The inspector confirmed that proprietary information was not provided or examined during the inspection.

On October 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.

4OA7 Licensee-Identified Violations

The following finding of very low significance was identified by Exelon and is a violation of NRC requirements which meets the criteria of Section VI of the NRC Enforcement Policy, NUREG-1600 for being dispositioned as NCVs.

10 CFR 50.47(b)(10), states a range of protective actions have been developed for emergency workers. Exelon's Standard Emergency Plan requires that "at least 50 percent of potential responders to the operations support center control teams are required to be qualified in the use of respiratory protection equipment." Contrary to this, during May and June, 2005, OSC emergency response support team members did not maintain their respiratory equipment qualifications within the 50 percent threshold criteria. This was identified in a focused area self-assessment and documented in the licensee's corrective action program as IR 349592. This finding was considered not more than Green significance because it did not constitute a failure to meet a risk significant planning standard.

ATTACHMENT: SUPPLEMENTAL INFORMATION

SUPPLEMENTAL INFORMATION

KEY POINTS OF CONTACT

Exelon Generation Company

R. DeGregorio, Site Vice President
C. Mudrick, Plant Manager
P. Orphanos, Director, Operations
P. Chase, Shift Operations Superintendent
J. Hunter, EP Manager
R. Mandik, EP Coordinator
S. Mannix, MAROG EP, Siren Manager
E. Kelly, Engineering Programs Manager
W. Astbury, System Manager - ESW
M. Kowalski, Maintenance Rule Coordinator
J. Mitman, MOV Program Engineer
P. Tarpinian, PRA Engineer

LIST OF ITEMS OPENED, CLOSED, AND DISCUSSED

Opened and Closed

05000353/2005004-01	NCV	Failure to scope emergency service water back-up supply to turbine enclosure cooling water into the Maintenance Rule program (Section 1R12)

Closed

05000352/2004004-03 05000353/2004004-03	URI	Removal of sheltering option from PAR (Section 1EP4)
05000352/1-05-002	LER	Loss of Offsite Source (Section 4OA3)
05000353/2-05-003	LER	Transient Exceeded Licensed Maximum Power Level (Section 4OA3)

LIST OF DOCUMENTS REVIEWED

Section 1R11: Licensed Operator Requalification

Procedures

OP-AA-101-111, “Roles and Responsibilities of On-Shift Personnel,” Revision 1

Control Room Log for August 2005
Technical Specification Section 6.2.2, “Unit Staff”
Technical Specification Change Request 94-46-0

Section 1R12: Maintenance Effectiveness

Issue Reports and Action Requests

098546, 160221, 208507, 222094, 227599, 234366, 245232, 248131, 248226, 253302, 259946, 272349, 273124, 275440, 281493, 284062, 284832, 290035, 291545, 300206, 304725, 308074, 310730, 310732, 320173, 322420, 326662, 328860, 356896, 359693, 360214, 360602, 361673, 362498, 367378, 367742, A1317522, A1449344, A1467643, A1481672, A1513634, A1525949

Procedures

S11.8.B, "Alternate Cooling of TECW Heat Exchangers," Revision 10
ON-117, "Loss of TECW," Revision 8
ON-117 Bases, "Loss of TECW - Bases," Revision 9
E-10/20, "Loss of Off Site Power," Revision 36
ER-LG-310-1010,"Maintenance Rule Implementation - Limerick,” Revision 3
ST-6-101-931-1(2), "IST Valve Indicator Verification," Revision 5

Miscellaneous

Maintenance Rule Basis Document for ESW, Fuel Pool Makeup by RHR / ESW, Turbine Enclosure Cooling Water, Reactor Enclosure Cooling Water, and Fire Protection
System Health Overview Report, dated June 2005
Plant Health Committee System Presentation, dated June 2005

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

Procedures
OT-104, “Unexpected/Unexplained Positive or Negative Reactivity Insertion,” Revision 41
OT-100, “Reactor Low Level,” Revision 27
GP-5, “Steady State Operations,” Revision 120
GP-18, “Scram/ATWS Event Review,” Revision 45
RT-2-095-900-0, “Location of Battery Grounds,” Revision 8

Issue Reports and Action Requests
354065, 354285, 374676, A1531328

Miscellaneous
Operator Logs, dated 09/18/2005
Operator Logs, dated 07/21/2005

Section 1R16: Operator Workarounds

Issue Reports and Action Requests

A1500181, A1462527, A1440434, A1433308

Procedures

OP-AA-102-103, "Operator Work-Around Program," Revision 1

Section 1R19: Post Maintenance Testing

Issue Reports and Action Requests

353683, 366116, 366983, A1517520, A1523499, A1523500

Work Orders

R0830896

Section 1R22: Surveillance Testing

Issue Reports and Action Requests

366240

Section 1EP2: ANS Testing

ANS Field Observation Checklists, Rev. 0
EP-MA-121-1002, "Exelon East ANS Program," Revision 2
EP-MA-121-1004, "Exelon East ANS Corrective Maintenance," Revision 2
EP-MA-121-1006, "Exelon East ANS Siren Monitoring, Troubleshooting & Testing," Revision 1
ANS Mid-2005 Self-Assessment Report
IR 358446, Deficiencies Self-Identified in Mid-2005 ANS FASA
Exelon East ANS Preventative Maintenance Program

Section 1EP3: ERO Augmentation Testing

EP-AA-112-100-F-07, "Mid-Atlantic ERO Notification or Augmentation," Revision B
TQ-AA-113, "ERO Training and Qualification," Revision 6
ERO Notification and Backup Activation Process Checklist

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

EAL Revision Review

EP-AA-1000, "Standardized Radiological Emergency Plan", Revision 16
EP-AA-1008, "Radiological Emergency Plan Annex for Limerick", Revision 7

EP-AA-120-1001, “10 CFR 50.54(q) Change Evaluation,” Revision 4

Section 1EP5: Correction of EP Weaknesses and Deficiencies

Issue Reports and Action Requests

216455, Deficiencies with TSC HVAC
217538, Inadequate Corrective Actions
219018, Drill Failed Demonstration
273043, EP Advisory Committee Action Items
282807, ERO Call-in System Problem
329833, Deficiencies in Conduct of EP Inventories
156981, EP Pager Test Deficiencies
163992, Second Quarter EP Pager Test Deficiencies
168857, NOS Rated EP as Declining for 2Q03
213805, Limerick EP Drill failed Demonstration Criteria
331115, Inadequate Closure Documentation for a Corrective Action
232252, 2004 EP Drill Issues
224025, PAR Upgrade Based on ED Discretion
201177, Unannounced Table Top Drill
337629, 2005 Corporate Comparative Audit Report

Procedures

LS-AA-126, “Self Assessment Program ,” Revision 4
LS-AA-126-1001, “Focus Area Self Assessment Program,” Revision 3
LS-AA-120, “Issue Identification and Screening Process,” Revision 3
LS-AA-125, “Corrective Action Program,” Revision 8

Miscellaneous

FASA No. 287265, NOS 50.54(t) Audit Preparation
FASA No. 288732, Readiness for 2005 NRC Inspection

Section 4OA1: PI Verification

EP-AA-125-1001, “EP Performance Indicator Guidance,” Revision 4
EP-AA-125-1002, “ERO Performance, Performance Indicator Guidance,” Revision 3
EP-AA-125-1003, “ERO Readiness, Performance Indicator Guidance,” Revision 4
EP-AA-125-1004, “Emergency Response Facilities and Equipment Performance Indicator Guidance,” Revision 3

Section 4OA2: Other

P&IR Annual Sample - Emergency Service Water Makeup to Spent Fuel Pool

Issue Reports and Action Requests

296983, 290035, 326662, A1424960, A1498817, A1503973

Procedures

S53.0.A, "Normal Makeup / Response to Low Level in Fuel Storage Pool," Revision 20
ON-125, “Loss of Fuel Pool Cooling," Revision 6
TSG-4.1, "Operational Contingency Guidelines," Revision 0
ST-6-053-203-1, "Fuel Pool Cooling and Cleanup Valve Test," Revision 3
ST-6-053-203-2, "Fuel Pool Cooling and Cleanup Valve Test," Revision 3

Miscellaneous

UFSAR Section 9.1.3, "Fuel Pool Cooling and Cleanup System"

Drawings

M-11, Sheet 2, "P&ID - Emergency Service Water," Revision 70
M-11, Sheet 3, "P&ID - Emergency Service Water," Revision 50
M-53, Sheet 1, "P&ID - Fuel Pool Cooling and Cleanup," Revision 48
M-53, Sheet 2, "P&ID - Fuel Pool Cooling and Cleanup," Revision 47
M-53, Sheet 3, "P&ID - Fuel Pool Cooling and Cleanup," Revision 16
M-53, Sheet 4, "P&ID - Fuel Pool Cooling and Cleanup," Revision 15

Section 4OA3: Event Followup

Issue Reports and Action Requests

321903, 321967, 324192, 322975, 339758

Procedures

E-10, “Loss of Number 10 Transformer Feed,” Revision 13
E-20, “Loss of Number 20 Transformer Feed,” Revision 13

LIST OF ACRONYMS

ANS	Alert and Notification System
CFR	Code of Federal Regulations
CR	Condition Report
DEP	Drill and Exercise Performance
E-Plan	Emergency Plan
EAL	Emergency Action Level
EOP	Emergency Operating Procedures
EP	Emergency Preparedness
ERO	Emergency Response Organization
ESW	Emergency Service Water
FASA	Focus Area Self Assessment
IMC	[NRC] Inspection Manual Chapter
INPO	Institute of Nuclear Power Operations
IR	Issue Report

LER	Licensee Event Report
MCC	Motor Control Center
MPFF	Maintenance Preventable Functional Failure
MR	Maintenance Rule
NCV	Non-Cited Violation
NRC	Nuclear Regulatory Commission
P&ID	Piping and Instrumentation Diagram
PAR	Protective Action Recommendation
PI	Performance Indicator
RHR	Residual Heat Removal
SDP	Significance Determination Process
SFP	Spent Fuel Pool
SSC	Structure, System, or Component
TECW	Turbine Enclosure Cooling Water
UFSAR	Updated Final Safety Analysis Report