21 July 2004

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 05000352/2004003, 05000353/2004003

Dear Mr. Crane:

On June 30, 2004, the United States Nuclear Regulatory Commission (NRC) completed an inspection at your Limerick Generating Station Units 1 and 2. The enclosed integrated report documents the inspection findings, which were discussed on July 8, 2004 with Mr. B. Hanson 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 NRC-identified findings of very low safety significance (Green). Both of these findings were determined to involve violations of NRC requirements. However, because of their very low safety significance and because they entered into your corrective action program, the NRC is treating these two issues as non-cited violations (NCVs), in accordance with Section VI.A of the NRC's Enforcement Policy. If you contest any NCV in this report, you should provide a response within 30 days of the date of this inspection report with the basis for your denial, to the Nuclear Regulatory Commission, ATTN: Document Control Desk, Region I; the Director, Office of Enforcement, United States Nuclear Regulatory Commission, Washington, D.C. 20555-0001; and the NRC Resident Inspector at the Limerick facility.

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

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

Sincerely,

/RA/

Mohamed Shanbaky, Chief
Projects Branch 4
Division of Reactor Projects

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

Enclosure: Inspection Report 05000352/2004003, 05000353/2004003
w/Attachment: Supplemental Information

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REGION I

Docket Nos:	50-352; 50-353
License Nos:	NPF-39, NPF-85
Report No:	05000352/2004003 and 05000353/2004003
Licensee:	Exelon Generation Company, LLC
Facility:	Limerick Generating Station, Units 1 & 2
Location:	Evergreen and Sanatoga Roads Sanatoga, PA 19464
Dates:	April 1, 2004 through June 30, 2004
Inspectors:	A. Burritt, Senior Resident Inspector S. Hansell, Senior Resident Inspector J. Talieri, Resident Inspector B. Welling, Resident Inspector D. Jackson, Reactor Inspector G. Johnson, Operations Engineer J. Williams, Sr. Operations Engineer (Contractor)
Approved by:	Mohamed Shanbaky, Chief Projects Branch 4 Division of Reactor Projects

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SUMMARY OF FINDINGS

IR 05000352/2004003, IR 05000353/2004003; 04/01/2004 - 06/30/2004; Limerick Generating Station, Units 1 and 2; Equipment Alignment, Operability.

The report covered a 3-month period of inspection by resident inspectors and announced inspections by Operations Engineer, Sr. Operations Engineer, and Reactor 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.

A. NRC-Identified and Self-Revealing Findings

Cornerstone: Mitigating Systems

- Green. The inspectors identified a finding of very low safety significance that is also a non-cited violation (NCV) of 10 CFR 50, Appendix B, Criterion XVI, "Corrective Action." Specifically, Exelon did not properly identify and correct a jacket water leak on the D24 emergency diesel generator.

  This finding is more than minor because if left uncorrected, it would become a more significant safety concern. The leakage rate did not reach a level that made the D24 emergency diesel generator (EDG) inoperable or unavailable. However, the rapidly increasing rate of leakage, if left uncorrected, could have caused the EDG to be unavailable and inoperable. The issue affected the Mitigating Systems cornerstone. This finding was assessed using Phase 1 of the Significance Determination Process (SDP) for Reactor Inspection Findings for At-Power Situations. The finding was determined to be of very low safety significance (Green), because while the Mitigating System was degraded, there was not an actual loss of safety function, and the finding is not potentially risk significant due to seismic, flood, fire, or severe weather initiating events.

  The inspectors identified that a contributing cause of the finding was related to the problem identification and resolution cross-cutting area, in that Operations personnel did not adequately resolve known problems with a D24 emergency diesel generator jacket water leak. (Section 1R04)

- Green. The inspectors identified a finding of very low safety significance that is also a non-cited violation of Technical Specification 6.8.1, "Procedures," because Exelon staff did not follow procedures. Specifically, when soluble manganese in the spray pond water was above 100 parts-per-billion (ppb), the actions specified in the procedure were not taken.

  This finding is more than minor because if left uncorrected, it would adversely impact the reliability of the 2B residual heat removal (RHR) heat exchanger

following an accident. By not following the chemistry procedures, the spray pond chemistry would be out of specification for extended periods, increasing the likelihood of operation of the 2B heat exchanger with poor quality cooling water which could cause accelerated corrosion of the heat exchanger tubes. The finding impacts the Mitigating System Integrity Cornerstone because it is associated with the reliability of the 2B RHR subsystem, a mitigating system. This finding is determined to have very low safety significance (Green) by Phase 1 of the Reactor Inspection Findings for At-Power Situations Significance Determination Process because the performance deficiency does not result in a loss of safety function and is not potentially risk significant due to a seismic, flood, fire, or severe weather initiating event.

The inspectors identified that a contributing cause of this finding involved a human performance error because operators did not ensure actions were taken consistent with the 2B RHR heat exchanger operability evaluation and the applicable chemistry procedures. The inspectors also identified that a contributing cause to this finding was related to the cross cutting area of Problem Identification and Resolution. This is the third finding within the last year in which the station did not properly implement chemistry sampling and analysis procedures. (Section 1R15)

B. Licensee-Identified Violations.

None.

REPORT DETAILS

Summary of Plant Status

Unit 1 began this inspection period operating at 100% power and remained at or near that power level except for brief periods of planned testing.

Unit 2 began this inspection period operating at 100% power. On June 22, 2004, Unit 2 shut down automatically due to 500 KV switchyard problems. On June 27, the unit was restored to 100 % power. The unit remained at or near that power level except for brief periods of planned testing.

1. REACTOR SAFETY

Cornerstones: Initiating Events, Mitigating Systems, Barrier Integrity

1R01 Adverse Weather Protection (71111.01 - 1 sample)

a. Inspection Scope

Seasonal Readiness. The inspectors reviewed the station's summer seasonal readiness preparations and toured the circulating water pump structure, the spray pond pump house and various areas of the turbine and reactor enclosures. The inspectors verified the adequacy of summer weather protection for components within these structures. The systems and components inspected included:

- residual heat removal service water system
- emergency service water system
- service water system
- circulating water system

The inspector reviewed the following documents:

- GP 7.1 Summer Weather Preparation and Operation
- 2004 Summer Readiness Project Plan
- Work Order R0943698

This inspection activity represented one sample.

b. Findings

No findings of significance were identified.

1R04 Equipment Alignment (71111.04 - 4 samples)

a. Inspection Scope

Partial System Walkdown. (71111.04Q - 3 samples)

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

- D21, D22, D24 emergency diesel generators while D23 out-of-service for maintenance
- Unit 1 high pressure coolant injection with reactor core isolation coolant out-of-service
- Unit 2 reactor core isolation cooling with high pressure coolant injection out-of-service

Complete System Walkdown. (71111.04S - 1 sample)

The inspector performed a complete system walkdown on the unit standby liquid control (SLC) system to verify that the equipment was properly aligned. The walkdown included reviews of valve positions, major system components, electrical power availability, and equipment deficiencies. The inspector reviewed system checkoff lists, system operating procedures, the system piping and instrumentation diagram and updated final safety analysis report. The inspector reviewed outstanding maintenance activities and condition reports associated with the Unit SLC system to determine if they would adversely affect system operability. The inspector verified in the control room and in the SLC system area that valves, including locked valves, were correctly positioned and did not exhibit leakage that would impact the function of the valve. The inspector 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

1. Inadequate Corrective Actions for an Emergency Diesel Generator Jacket Water Leak

Introduction. A Green non-cited violation (NCV) of 10 CFR 50, Appendix B, Criterion XVI, “Corrective Action,” was identified by the inspectors because Exelon did not properly identify and correct a jacket water leak on the D24 emergency diesel generator.

Description. During two test runs of the D24 emergency diesel generator (EDG) in late March and early April 2004, operators and station personnel staff did not initially identify nor, upon identification by the inspector, properly evaluate a leak on the jacket water system. On March 25, 2004, shortly after the D24 EDG was shutdown following a routine surveillance test run, the inspector observed puddles of water beneath the EDG heat exchangers and identified a leak on the air coolant heat exchanger. The operators had not noticed the leak during the test run. Operators concluded that it was a minor leak (2 - 3 drops per minute) from the emergency service water (ESW) side of the heat exchanger and documented this information on an action request. During a subsequent run of the D24 EDG on April 2, the inspector observed that the leakage rate was significantly greater than that documented on the action request, and the inspector brought this to the attention of the operators. The operators updated the action request with an estimated leak rate of 60 drops per minute, and they used the previous assumption that the leak was from ESW when assessing the operability of the EDG.

During a test run on April 13, operators observed that the leakage rate had increased further (120 drops per minute) and questioned whether the source of the leak was ESW. Subsequent chemistry samples revealed the leak was actually from the air coolant/jacket water system. The air coolant and jacket water systems share a common jacket water expansion tank, and Limerick treated the leak as part of jacket water system. Jacket water leaks are more significant than ESW because jacket water is a closed system and has a more stringent leakage rate limit. Based on the increasing trend of the leakage rate, operators declared the EDG inoperable on April 13 and performed needed repairs. The EDG was declared operable following repairs and post-maintenance testing on April 14.

The inspectors reviewed the events leading to the EDG inoperability and concluded that Exelon did not identify and properly evaluate the degraded condition on the D24 EDG in late March and early April. Consequently, Exelon did not initiate actions to correct the condition before it led to unplanned EDG inoperability. Specifically,

- Operators did not identify the leak on March 25 despite visible puddles of water
- Operators did not identify the apparent increase in leakage rate during the April 2 test run until pointed out by the inspector
- Operation's evaluation of the leak (during the March 25 and April 2 runs) incorrectly concluded that it was from ESW, even though the affected heat exchanger flange could leak ESW or jacket water
- Operations supervision, maintenance, and engineering did not evaluate or question the source of the leak in March and early April during operability determinations, walkdowns, and functional failure determinations

Analysis. The finding is a performance deficiency because Exelon did not properly identify and take prompt actions to correct a condition adverse to quality; namely, a jacket water leak on the D24 EDG. 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 licensee procedures. This finding is more than minor because if left uncorrected, it

could become a more significant safety concern. The leakage rate did not reach a level that made the D24 EDG inoperable or unavailable. However, the rapidly increasing rate of leakage, if left uncorrected, could have caused the EDG to be unavailable and inoperable. Therefore, operators appropriately declared the EDG inoperable to perform needed repairs. The inspectors concluded that this issue affected the Mitigating Systems cornerstone. This finding was assessed using Phase 1 of the Significance Determination Process (SDP) for Reactor Inspection Findings for At-Power Situations. The finding was determined to be of very low safety significance (Green), because while the Mitigating Systems area was degraded, there was not an actual loss of safety function, and the finding is not potentially risk significant due to seismic, flood, fire, or severe weather initiating events. The inspectors identified that a contributing cause of the finding was related to the problem identification and resolution cross-cutting area, in that Operations personnel did not adequately resolve known problems with a D24 emergency diesel generator jacket water leak.

Enforcement. 10 CFR 50, Appendix B, Criterion XVI, "Corrective Action," requires, in part, that measures be established to assure that conditions adverse to quality, such as failures, malfunctions, deficiencies, deviations, defective material and equipment, and nonconformances are promptly identified and corrected. Contrary to the above, prior to April 13, 2004, Exelon staff did not identify and correct a jacket water leak on the D24 EDG, a condition adverse to quality. Consequently, the EDG was declared inoperable for needed repairs. Because this issue is of very low safety significance and has been entered into the licensee's corrective action program (CR 214759), this violation is being treated as an NCV, consistent with Section VI.A of the NRC Enforcement Policy. **(NCV 05000352/2004003-01, 05000353/2004003-01, Inadequate Corrective Actions for Emergency Diesel Generator Jacket Water Leak)**

1R05 Fire Protection (71111.05Q - 8 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 eight samples. The following fire areas were inspected:

- spray pond pump house (Fire Area 122)
- spray pond pump house (Fire Area 123)
- auxiliary equipment (Fire Area 25)
- remote shutdown panel (Fire Area 26)
- Unit 1 cable spreading room (Fire Area 22)
- Unit 2 cable spreading room (Fire Area 23)
- Unit 2 "C" core spray (Fire Area 60)

- Unit 2 A&C residual heat removal heat exchanger and pump room (Fire Area 54)

b. Findings

No findings of significance were identified.

1R06 Flood Protection Measures (71111.06 - 1 sample)

a. Inspection Scope

The inspector reviewed internal flood protection features in Unit 1 and Unit 2 associated with the risk significant residual heat removal systems (RHR). The inspector reviewed the UFSAR. The inspector walked down the affected RHR room and adjoining rooms to verify the adequacy of sealing of equipment below the projected flooded water level, that there were no holes between floors and walls between rooms, the adequacy of water tight doors, and the adequacy of the drain systems and sump pumps. The inspector also verified that procedures were in place to identify and respond to a flooding event in these rooms. This inspection activity represented one sample.

The inspector reviewed the following documents:

- Work Orders R0825470, R0826229, R0829312, R0046663, R0695116, R0538954, and 0733652
- Condition Report 222811
- Action Requests A1469315 and A1467344

b. Findings

No findings of significance were identified.

1R11 Licensed Operator Requalification (71111.11 - 1 sample, 71111.11Q - 1 sample)

a. Inspection Scope

Licensed Operator Requalification Program (LSRO) (71111.11 - 1 sample)

A review was conducted of recent operating history documentation found in inspection reports, licensee event reports, the licensee's corrective action program, and the most recent NRC plant issues matrix (PIM). The senior resident inspector was also consulted for insights regarding licensed operators' performance. One event did indicate it was indicative of possible training deficiencies (LER 352-03002), and its resolution on additional and procedural changes were reviewed for adequacy.

The below listed inspection activities were performed using NUREG 1021, Rev. 9, "Operator Licensing Examination Standards for Power Reactors," Inspection Procedure Attachment 7111111, "Licensed Operator Requalification Program," Appendix A "Checklist for Evaluating Facility Testing Material."

The operating and written exams administered the week of May 17, 2004, as well as a sample of other exams administered to individuals during prior examination periods, were reviewed for quality and performance.

The results of the annual operating tests for years 2002 and 2004 and the written exam for 2004 were reviewed (in office) for quality, performance and grading.

Observations were made of the written exam and performance measures (JPM) administered during the week of May 17, 2004. These observations included exam security, exam grading and facility evaluations during the individual performance of 5 JPMs (for each licensee).

The remediation plans for individual failures over the past two-year requalification program cycle were reviewed to assess the effectiveness of the remedial training. (Only one individual failure during this period.) The remediation plan, which required administration of a complete, new written examination following self study of relevant lesson material, was reviewed for adequacy.

License reactivations for the past two-year requalification program cycle were also reviewed to ensure that 10 CFR 55.53 license conditions and applicable program requirements were met. Particular attention was paid to this area due to URI 05000317; 05000318/01-12-01.

Instructors and training/operation's management were interviewed for feedback regarding the implementation of the licensed operator (LSRO) requalification program.

A sample of records for requalification training attendance, program feedback, reporting, and medical examinations were reviewed for compliance with license conditions, including NRC regulations.

The inclusion of industry events in order to bring external experiences into the LSRO Requalification Program was reviewed for adequacy.

An assessment of whether failure rates are consistent with the guidance of NUREG-1021, Revision 9, "Operator Licensing Examination Standards for Power Reactors" and NRC Manual Chapter 0609, Appendix I, "Operator Requalification Human Performance Significance Determination Process (SDP)," was also performed. The SDP review verified the following:

1. Individual pass rates on the written exam were greater than 80%. (Pass rate was 85.7%)

2. Individual pass rates on the job performance measures of the operating exam were greater than 80%. (Pass rate was 100%)

3. More than 75% of the individuals passed all portions of the exam. (85.7% of the individuals passed all portions of the examination)

This inspection activity represented one sample.

Simulator Evaluation (71111.11Q - 1 sample)

On June 1, 2004, the inspector observed a licensed operator requalification training program as-found simulator scenario to assess licensed operator performance and the evaluator's critique of operator performance. This inspection activity represented one sample. The inspector also referred to the simulator scenario document, LSES 7010, Rev. 001, and the off-normal plant procedures and emergency operating procedures listed in the Attachment.

b. Findings

No findings of significance were identified.

1R12 Maintenance Effectiveness (71111.12 - 1 sample)

a. Inspection Scope

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

- A1455017 D13 fuel oil transfer pump

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 six samples. The selected maintenance activities included:

- D14 emergency diesel generator overhaul
- Unit 2 reactor core isolation coolant out-of-service with electrohydraulic control problems
- Unit 2 high pressure coolant injection out-of-service
- 2B residual heat removal out-of-service
- Unit 1 high pressure coolant injection out-of-service for venting of suction check valve
- Unit 1 reactor core isolation coolant out-of-service for lube oil leak repairs

b. Findings

No findings of significance were identified.

1R14 Personnel Performance During Non-routine Plant Evolutions (71111.14 - 2 samples)

a. Inspection Scope

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

- Toxic Gas Event

Reactor Trips. On June 22, 2004, Unit 2 shut down automatically due to 500 KV switchyard problems. The inspector responded to the control room and observed licensed operators' performance of emergency operating procedures and plant recovery procedures. In assessing operator performance and procedural compliance, the inspector reviewed the following documents:

- GP-18, “Scram/ATWS Event Review”
- CR 230481
- CR 230585

This inspection activity represented two samples.

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. This inspection activity represented five samples. The issues reviewed included:

- D22 emergency diesel generator blower clearances (A1461876)
- D24 jacket water leak (A1461507)
- Unit reactor core isolation coolant trip during high pressure coolant injection test (suction transfer) (A1464946)
- Unit 2 redundant reactivity control system (A1464677)
- 2B residual heat removal heat exchanger with spray pond manganese levels above limits established in the associated operability determination. The inspectors evaluated Exelon’s monitoring and control of the quality of the spray pond water to ensure that the degraded 2B RHR heat exchanger remained operable. The evaluation was focused on the reliability of the RHR heat exchanger during the 180-day mission time following an assumed event

The inspector reviewed the following documents:

- Chemistry sample results
- CR149191 - Supporting Operability Documentation
- Exelon Procedure CY-LG-120-110, ”Chemistry Sampling, and Analysis”
- Exelon Procedure CY-LG-120-1102, ”Outside Chemistry/NPDES Related Sampling and Analysis Schedule”

b. Findings

Introduction. The inspectors identified a finding of very low safety significance (Green) that is also a non-cited violation of Technical Specification 6.8.1, “Procedures,” because the Exelon staff did not follow procedures. Specifically, when soluble manganese in the spray pond water was above 100 parts-per-billion (ppb), the actions specified in the procedure were not taken.

Description. The operability evaluation (CR 149191) discussed a corrosion mechanism associated with manganese in the spray pond water that had caused significant pitting of the 2B RHR heat exchanger tubes. Revision 3 of the operability evaluation documented that “maintaining spray pond chemistry parameters within the limits of the procedure ensures the long term reliability of the RHR heat exchanger post accident.” The operability evaluation also states that “operation outside of the limits and/or goals of the procedure does not necessarily render the heat exchanger inoperable but the condition must be evaluated.” Exelon Procedure CY-LG-120-1102, ”Outside Chemistry/NPDES Related Sampling and Analysis Schedule," specifies weekly sampling of the spray pond and if a spray pond parameter is out of specification, then have engineering evaluate the condition for the effect on 2B RHR heat exchanger and return the parameter to specification as soon as possible.

On April 19, 2004, spray pond water was sampled and analyzed during operation of the ESW system through the spray network during testing of an emergency diesel generator. The results of the analysis indicated that soluble manganese was above the specification of 100 ppb. The technician informed his supervisor and then obtained a confirmatory sample of spray pond water during the EDG test. The second sample analysis results were similar to the first sample, with soluble manganese above 100 ppb. When the EDG test was complete, the operation of the ESW system through the spray network was secured. No corrective actions were taken to lower the spray pond water soluble manganese levels to below 100 ppb. On April 20, 2004, spray pond water was again sampled and analyzed during operation of the spray network during a biocide treatment. The results of the analysis, obtained after completion of the biocide treatment, again indicated that soluble manganese was above 100 ppb. The results were as follows:

Sample and Analysis Date	Analysis Result - Manganese
04-19-04 (0930)	245 ppb
04-19-04 (1115)	194 ppb
04-20-04 (1230)	328 ppb
04-23-04	90 ppb

The inspector determined that Exelon did not promptly evaluate the high soluble manganese condition for the effect on the 2B RHR heat exchanger and did not take actions to return spray pond chemistry to within specification as soon as possible, as required by procedures. Exelon had previously determined that operation of the spray

pond spray network was the most effective way to lower spray pond water soluble manganese levels. On April 23, the sprays were put in operation and the manganese level was returned to below 100 ppb.

Analysis. The finding is a performance deficiency because the Exelon staff did not properly implement a chemistry procedure for sampling and analysis of the spray pond water. This procedure is within the scope of procedures described in Regulatory Guide 1.33, as required by Technical Specification 6.8.1. Traditional enforcement does not apply, because the issue does not have any actual safety consequences or potential for impacting the NRC's regulatory function and is not the result of any willful violation of NRC requirements or Exelon procedures. This finding is more than minor because if left uncorrected, it would adversely impact the reliability of the 2B RHR heat exchanger following an accident. By not following the chemistry procedures the spray pond chemistry would be left out of specification for extended periods, increasing the likelihood of operation of the 2B heat exchanger with poor quality cooling water which could cause accelerated corrosion of the heat exchanger tubes. The finding impacts the Mitigating System Cornerstone because it is associated with the reliability of the 2B RHR subsystem, a mitigating system. This finding is determined to have very low safety significance (Green) by Phase 1 of the Reactor Inspection Findings for At-Power Situations Significance Determination Process because the performance deficiency does not result in a loss of safety function and is not potentially risk significant due to a seismic, flood, fire, or severe weather initiating event.

The inspectors identified that a contributing cause of this finding involved a human performance error because operators did not ensure actions were taken consistent with the 2B RHR heat exchanger operability evaluation and the applicable chemistry procedures. The inspectors also identified that a contributing cause to this finding was related to the cross cutting area of Problem Identification and Resolution. This is the third finding within the last year in which Exelon did not properly implement chemistry sampling and analysis procedures.

Enforcement. Technical Specification 6.8.1 requires, in part, that written procedures be established, implemented, and maintained covering the applicable procedures in Appendix "A" of Regulatory Guide 1.33, Revision 2, February 1978. Appendix "A" of Regulatory Guide 1.33 includes chemical control procedures that specify the instructions for maintaining water quality within the prescribed limits. Exelon Procedure CY-LG-120-1102, "Outside Chemistry/NPDES Related Sampling and Analysis Schedule," specifies, in part, if a spray pond parameter is out of specification, then have engineering evaluate the condition for the effect on 2B RHR heat exchanger and return the parameter to specification as soon as possible. Contrary to the above between April 19 to April 23, 2004, engineering did not evaluate the condition for the effect on the 2B RHR heat exchanger. Additionally, soluble manganese in the spray pond water was not returned to within the specification as soon as possible. Because the failure to properly implement Exelon Procedure CY-LG-120-1102 is of very low safety significance and has been documented in Exelon's corrective action program as CR 215727, this violation being treated as a non-cited violation (NCV), consistent with Section VI.A. of the NRC

Enforcement Policy: **(NCV 05000352/2004003-02 and 05000353/2004003-02, Did Not to Follow Chemistry Procedure CY-LG-120-1102).**

1R16 Operator Workarounds (71111.16 - 1 sample)

a. Inspection Scope

The inspectors reviewed the aggregate impact of Unit 1 and 2 documented operator workarounds and challenges, equipment deficiencies, and open operability evaluations. The inspectors evaluated the cumulative effects of these items on the ability of operators to respond in a correct and timely manner. The inspectors also reviewed these deficiencies to determine if there were any items that complicated the operators' ability to implement emergency operating procedures, but were not identified as operator workarounds. This inspection activity represented one sample.

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 reactor core isolation coolant lube oil filter canister leak repairs (C0209526)
- Unit 2 reactor core isolation coolant system outage (ST-6-049-200-2, reactor core isolation coolant valve test and ST-6-049-230-2, reactor core isolation coolant pump valve and flow test, C0209396, R0620559, R0866711, R0866336)
- Unit 1 reactor core isolation coolant trip unit card (R0959377-01, ST-6-049-200-1 reactor core isolation coolant valve test, R0960048-01, ST-6-049-230-1 reactor core isolation coolant pump, valve and flow test)
- D12 emergency diesel generator brush replacement and air leak (R0964117-01, ST-6-092-312-1 D12 diesel generator slow start operability test run)
- D23 emergency diesel generator ground bushing (M1466909, 592.1.0 local and remote manual startup of a diesel generator)
- 1D residual heat removal system outage

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

- R0960576
- ST-6-051-234-1, “D Residual Heat Removal Pump, Valve and Flow Test”

b. Findings

No findings of significance were identified.

1R22 Surveillance Testing (71111.22 - 6 samples)

a. Inspection Scope

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

- RT-2-011-253-0, emergency service water loop “A” flow verification
- ST-6-076-250-1, standby gas treatment system and reactor enclosure recirculation system flow test
- ST-2-055-100-1, high pressure coolant injection logic system functional isolation test
- ST-6-055-230-2, high pressure coolant injection pump valve and flow test
- RT-6-001-490-2, main turbine underspeed/overspeed trip test
- ST-2-088-321-1, remote shutdown system division 1 residual heat removal operability test

b. Findings

No findings of significance were identified.

1R23 Temporary Plant Modifications (71111.23 - 1 sample)

a. Inspection Scope

The inspector reviewed the following temporary plant modification:

- temporary cooling to 2A & 2C circulating water pumps (A1397247, A1379240, A1465043)

The inspector verified that the temporary change did not adversely affect system or support system availability, or adversely affect a function important to plant safety. The inspector verified that the applicable design and licensing bases were considered and

that 10 CFR 50.59 reviews were appropriate. This inspection activity represented one sample.

b. Findings

No findings of significance were identified.

Cornerstone: Emergency Preparedness

1EP6 Drill Evaluation (71114.06 - 2 samples)

a. Inspection Scope

The inspectors evaluated emergency preparedness drills on April 16, 2004 and April 23, 2004. The inspectors reviewed the scenarios to identify the timing and location of classification, notification and Protective Action Recommendation (PAR) development activities. During the drill, 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 two samples.

b. Findings

No findings of significance were identified.

4. OTHER ACTIVITIES

4OA1 Performance Indicator Verification (71151 - 4 samples)

a. Inspection Scope

The inspectors sampled licensee submittals for the Performance Indicators (PIs) listed below. To verify the accuracy of the PI data recorded during that period, PI definitions and guidance contained in NEI 99-02, "Regulatory Assessment Indicator Guideline," Rev. 2, were used to verify the basis in reporting for each data element. The inspectors reviewed selected portions of operator logs, monthly operation reports, and LERs. Additionally, the inspectors discussed the PI data with Exelon personnel responsible for collection of the data.

Reactor Safety Cornerstone

The inspectors reviewed the accuracy and completeness of the supporting data for the following Limerick PIs:

- scrams (April 1, 2003 - March 31, 2004)
- scrams with LONHS (April 1, 2003 - March 31, 2004)

This inspection activity represented four samples.

b. Findings

No findings of significance were identified.

4OA2 Identification and Resolution of Problems (71152 - 1 Semi-annual Sample)

1. Routine PI&R Review

a. Inspection Scope

The inspectors reviewed selected condition reports (CRs), as part of the routine baseline inspection documented in this report. The CRs 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 CRs 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.

b. Findings

Within this limited review, no findings of significance were identified.

2. Semi-Annual PI&R Trend Review

a. Inspection Scope

The inspectors reviewed a list of 1500 condition report (CR) items, categorized as Level 4D, that Exelon initiated from January 1, 2004, thru June 25, 2004. The review was performed as part of the semi-annual Problem and Identification trend review of the Limerick corrective action program. Level 4D CR’s are considered low level problems that do not require a formal investigation to determine the cause of the problem or corrective actions. Sixteen of the CRs were reviewed in detail to verify whether the full extent of the issues were adequately identified, and the appropriate level of evaluation and corrective actions were performed. The inspectors evaluated the CRs against the requirements of LS-AA-125, "Corrective Action Program (CAP) Procedure," and 10 CFR 50, Appendix B, Criterion XVI, “Corrective Action.” The 16 CRs reviewed in detail were: 196953, 195775, 201860, 201983, 194458, 194334, 194031, 202391, 200202, 199841, 202873, 201313, 199665, 198457, 197871 and 197622. This inspection activity represented 1 semi-annual PI&R trend review.

b. Findings and Observations

Within this limited review, no findings or trends of significance were identified.

3. Cross-References to PI&R Findings Documented Elsewhere

Section 1R04 describes a finding where Exelon did not properly identify and correct a jacket water leak on the D24 emergency diesel generator. Initially, Exelon determined incorrectly that the leak was from the emergency service water system and delayed entering the degraded condition in the corrective action program.

Section 1R15 describes a finding where Exelon did not follow a chemistry procedure related to high manganese levels in the spray pond water supply. This is the third finding within the last year in which the station did not properly implement chemistry sampling and analysis procedures.

4OA5 Other Activities

Temporary Instruction (TI2515/156)

a. Inspection Scope

Temporary Instruction 2515/156, "Offsite Power." Phase I and Phase II of the inspection was completed during this inspection period. Appropriate documentation was provided to NRC management as required.

b. Findings

No findings of significance were identified.

4OA6 Meetings, Including Exit

Exit Meetings

On July 8, 2004, the resident inspectors presented the inspection results to Mr. Hanson and other members of his staff, who acknowledged the findings. The inspectors confirmed that proprietary information was not provided or examined during the inspection.

Annual Assessment Meeting

On April 8, 2004, the NRC held a meeting with Exelon, that was open for public observation, to discuss the results of the NRC's assessment of Exelon's performance at Limerick for the period January 1, 2003 through December 31, 2003. The handouts from the meeting are available electronically from the NRC's document system (ADAMS) under accession number ML040620011.

ATTACHMENT: SUPPLEMENTAL INFORMATION

SUPPLEMENTAL INFORMATION

KEY POINTS OF CONTACT

Exelon Generation Company

E. Callan, Director - Engineering
C. Fritz, Training
C. Goff, Ops Training Instructor
B. Hanson, Plant Manager
J. Krais, Senior Manager - Design Engineering
C. Mudrick, Director - Operations
P. Orphanos, Shift Operations Superintendent
C. Rich, Ops Training Manager

LIST OF ITEMS OPENED, CLOSED, AND DISCUSSED

Opened and Closed

05000352/2004003-01 and 05000353/2004003-01	NCV	Inadequate Corrective Actions for Emergency Diesel Generator Jacket Water Leak (Section 1R04)
05000352/2004003-02 and 05000353/2004003-02	NCV	Did Not Follow Chemistry Procedure CY-LG-120-1102 (Section 1R15)

LIST OF DOCUMENTS REVIEWED

Section 1R04: Complete System Walkdown

S48.1.A, “Standby Liquid Control System Set-Up For Normal Operations”
S48.9.A, “Routine Inspection of Standby Liquid Control System”
Drawing 8031-M-48
A1426830
A1436998
A1437028
CR 141201
CR 144653
CR 151896
CR 221019

Section 1R11: Licensed Operator Requalification

ON-107, “Control Rod Drive System Problems”
OT-112, “Recirculation Pump Trip”
OT-117, “RPS Failures”
T-101, “RPV Control”
T-117, “Level/Power Control”
T-102, “Primary Containment Control”
T-112, “Emergency Blowdown with ATWS Conditions”

LIST OF ACRONYMS

CFR	Code of Federal Regulations
CR	Condition Report
EDG	Emergency Diesel Generator
ESW	Emergency Service Water
JPM	Job Performance Measure
KV	Kilovolts
LER	Licensee Event Report
LGS	Limerick Generating Station
LSRO	Limited Senior Reactor Operator
NCV	Non-cited Violation
NRC	Nuclear Regulatory Commission
PAR	Protective Action Recommendation
PI	Performance Indicator
PIM	Plant Issues Matrix
ppb	Parts Per Billion
RHR	Residual Heat Removal
SDP	Significance Determination Process
SLC	Standby Liquid Control
SSC	System, Structure, or Component
UFSAR	Updated Final Safety Analysis Report