August 4, 2003

Mr. John Skolds
President and CNO
Exelon Nuclear
Exelon Generation Company, LLC
4300 Winfield Road
Warrenville, IL 60555

SUBJECT: LIMERICK GENERATING STATION - NRC INTEGRATED INSPECTION REPORT 05000352/2003003 AND 05000353/2003003

Dear Mr. Skolds:

On June 28, 2003, the US 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 2, 2003, with Mr. William Levis 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.

The report documents two NRC-identified findings of very low safety significance. One of these findings was determined to involve a violation of NRC requirements. However, because of the very low safety significance and because it has been entered into your corrective action program, the NRC is treating this issue as a Non-Cited Violation (NCV) consistent with Section VI.A 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, Region I; 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.

"Since the terrorist attacks on September 11, 2001, NRC has issued five Orders and several threat advisories to licensees of commercial power reactors to strengthen licensee capabilities, improve security force readiness, and enhance controls over access authorization. In addition to applicable baseline inspections, the NRC issued Temporary Instruction 2515/148, "Inspection of Nuclear Reactor Safeguards Interim Compensatory Measures," and its subsequent revision, to audit and inspect licensee implementation of the interim compensatory measures required by order. Phase 1 of TI 2515/148 was completed at all commercial power nuclear power plants during calender year '02 and the remaining inspection activities have been recently completed for Limerick Inspection Report 50-352/03-007, 50-353/03-007. The NRC will continue to monitor overall safeguards and security controls at Limerick.

In accordance with 10 CFR 2.790 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 Website 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 05000352/2003003, 05000353/2003003
w/Attachment: Supplemental Information

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U.S. NUCLEAR REGULATORY COMMISSION

REGION I

Docket Nos: 50-352, 50-353

License Nos: NPF-39, NPF-85

Report No: 05000352/2003003 and 05000353/2003003

Licensee: Exelon Generation Company, LLC

Facility: Limerick Generating Station, Units 1 & 2

Location: Evergreen and Sanatoga Roads
Sanatoga, PA 19464

Dates: March 30, 2003 - June 28, 2003

Inspectors: A. Burritt, Senior Resident Inspector
B. Welling, Resident Inspector
G. Smith, Senior Physical Security Inspector
J. Noggle, Senior Health Physics Inspector
F. Jaxheimer, Reactor Inspector
D. Florek, Senior Project Engineer

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

Enclosure

SUMMARY OF FINDINGS

IR 05000352/2003-003, 05000353/2003-003; 03/30-06/28/2003; Limerick Generating Station, Units 1 and 2; Surveillance Testing.

The report covered a three-month period of inspection by resident inspectors, a senior physical security inspector, a senior health physics inspector, a senior project engineer, and a reactor inspector. The inspection identified two Green findings, one of which is a Non-Cited Violation (NCV). The significance of most findings is indicated by their color (Green, White, Yellow, Red) using Inspection Manual Chapter (IMC) 0609, "Significance Determination Process" (SDP). 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 significance (Green) because Exelon's practice of performing preventive maintenance prior to required surveillance testing of recirculation pump trip breakers and safety-related battery chargers masked the as-found conditions of these components, and this practice had not been evaluated.

The finding is considered more than minor because it affected the ability to detect component degradation which would adversely impact the reliability of the RPT breakers and battery chargers to respond to initiating events and prevent undesirable consequences. This finding is of very low safety significance because it involved inadequate testing and did not degrade the capability of these components to perform their safety functions.

The inspectors also identified that a contributing cause of this finding was related to the cross-cutting area of Problem Identification and Resolution. After the inspectors noted the MSIV preconditioning issue in February 2003, Exelon's corrective actions included a review of other outage-related activities for unacceptable preconditioning. Exelon's corrective action review was narrow in scope and did not identify the RPT breaker and battery charger preconditioning issues. (Section 1R22)

Cornerstone: Barrier Integrity

Green. The inspectors identified a finding of very low significance (Green) that is also a violation of 10 CFR 50 Appendix B, Criterion XI, "Test Control," because Exelon's MSIV stroke time test procedure did not include sufficient steps to assure that, when the MSIVs are in-service in Operational Conditions 1, the MSIV full closure times will meet technical specification requirements.

The finding was considered more than minor, in that the issue was associated with the Maintain Functionality of Containment Procedure Quality attribute of the Barrier Integrity cornerstone, and it affected the cornerstone objective. The Barrier Integrity cornerstone objective was affected because the inadequate testing procedures adversely affect assurance that the containment would protect the public from radionuclide releases caused by accidents or events. This finding was also associated with the Procedure Quality attribute of the Mitigating Systems cornerstone, and it affected the cornerstone objective. The cornerstone objective was affected because the testing did not ensure the reliability of the MSIV's to respond to initiating events to prevent undesirable consequences.

This finding was determined to have very low safety significance (Green) by Phase 2 of the Reactor Inspection Findings for At-Power Situations Significance Determination Process. This finding was determined to be of very low safety significance because the issue involved inadequate testing and did not degrade the MSIVs capability to perform its safety function. Therefore, no mitigation equipment or sequences in Phase 2 were adversely impacted. (Section 1R22)

REPORT DETAILS

Summary of Plant Status

Unit 1 began this inspection period operating at 100% power. On April 23, 2003, the reactor shut down automatically due to low reactor water level. Sections 1R14 and 4OA3 of this report discuss this event in more detail. On April 27, the unit was restored to 100% power. On June 19, operators reduced power to approximately 81% following an unexpected closure of a main turbine control valve. The unit was restored to 100% later that day. The unit remained at or near 100% power level except for brief periods of planned testing and control rod pattern adjustments.

Unit 2 began this inspection period operating at 100% power. On April 9, unit load was reduced to approximately 57% for power suppression testing to verify fuel integrity. On April 13, the unit was restored to 100% power and remained at or near that power level except for brief periods of planned testing and control rod pattern adjustments.

1. REACTOR SAFETY [R]

Cornerstones: Initiating Events, Mitigating Systems, and Barrier Integrity

1R01 Adverse Weather Protection (71111.01)

a. Inspection Scope

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

- Emergency Diesel Generators
- Instrument Air Compressors
- Service Water System

The inspectors referred to the following documents:

- GP 7.1, Summer Weather Preparation and Operation
- S76.1.B, Startup of Reactor Enclosure HVAC
- S10.7.C, Service Water Flow Adjustments
- S75.1.A, Normal Operation of Turbine Enclosure HVAC

b. Findings

No findings of significance were identified.

1R04 Equipment Alignment (71111.04)

a. Inspection Scope

Partial System Walkdowns. 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. The partial walkdowns included the following systems:

- Unit 1 “B” Residual Heat Removal (RHR) with Unit 1 “A” RHR out of service for planned maintenance
- Unit 1 High Pressure Coolant Injection (HPCI) with Reactor Core Isolation Coolant (RCIC) out of service for corrective maintenance
- Unit 2 RCIC with HPCI out of service for planned maintenance

Complete Risk Important System Walkdown. The inspector performed a complete system walkdown on the Unit 1 residual heat removal (RHR) system for the suppression pool cooling mode of operation. The inspector verified that the portion of the RHR system that is needed for suppression pool cooling was properly aligned. The inspector reviewed system checkoff lists, system operating procedures, the system piping and instrumentation diagram and updated final safety analysis report (UFSAR). The inspector reviewed outstanding maintenance activities and condition reports (CRs) associated with the suppression cooling mode of the RHR system to determine if they would adversely affect system operability. The inspector also interviewed the system manager to identify any outstanding design issues, temporary modification, and operator workarounds affecting the suppression cooling mode of operation. The inspector verified in the control room and in the RHR system rooms that valves, including locked valves, were correctly positioned and did not exhibit leakage that would impact the function of the valve, electrical power was available, major components were labeled, hangers and supports were functional, and essential support systems were operational. The documents included in the review are listed in the Attachment.

b. Findings

No findings of significance were identified.

1R05 Fire Protection (71111.05)

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 UFSAR. The following fire areas were inspected:

- Unit 2 Class 1E Battery Room (Fire Area 5)
- Corridor (Fire Area 7)
- Unit 1 Class 1E Battery Room (Fire Area 8) Proc F-A-426, F-A-420, F-A-436, IF-A-425
- Unit 1 Class 1E Battery Room (Fire Area 9)
- Unit 1 Class 1E Battery Room (Fire Area 10)
- Unit 1 Class 1E Battery Room (Fire Area 11)
- Unit 2 D24 Emergency 4 Kv Switchgear Compartment (Fire Area 16)
- Unit 2 D23 Emergency 4 Kv Switchgear Compartment (Fire Area 18)
- Auxiliary Equipment Room (Fire Area 25)
- Control Structure Fan Room (Fire Area 27)
- Standby Gas Treatment Area (Fire Area 28)
- Unit 2 Reactor Enclosure RWCU Compartments, FPCCC Compartment, and General Equipment Area 283' (Fire Area 70)

b. Findings

No findings of significance were identified.

1R06 Flood Protection Measures (71111.06)

a. Inspection Scope

The inspector reviewed internal flood protection features in Unit 1 associated with the risk significant RHR system. The inspector reviewed the UFSAR. The inspector walked down the affected RHR 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. The inspector also reviewed CRs related to flooding conditions. The following documents were included in the review:

- UFSAR Section 3.4.1
- Piping and Instrument Diagram 8031 M-563 “Plumbing and Drainage - Reactor Building - Dirty Radwaste System”
- Piping and Instrument Diagram 8031 M-567 “Plumbing and Drainage - Reactor Building - Clean Radwaste System”
- Emergency Operating Procedure T-103 “Secondary Containment Control”
- Condition Reports - CRs: 85775, 142342

a. Findings

No findings of significance were identified.

1R11 Licensed Operator Requalification (71111.11)

a. Inspection Scope

On April 22 and June 3, 2003, the inspectors observed operating crew as-found scenarios. These observations assessed the licensed operators' performance and the evaluator's critique. The inspectors discussed the results with operators, operations management, and instructors. The inspectors also referred to the simulator scenario documents, LSTS-3217 and LES-8011, and off-normal plant procedures and emergency operating procedures which are listed in the Attachment.

b. Findings

No findings of significance were identified.

1R12 Maintenance Effectiveness (71111.12)

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. The following issues were reviewed:

- 2B core spray pump failure to start (A1406832) (CR 147491, Assignment 12)
- 2D core spray suction valve failure to open (A1406870) (CR 151006)
- Deep bed condensate demineralizer system not in scope of Maintenance Rule (CR 155365)

b. Findings

No findings of significance were identified.

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

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 field walkdowns to verify whether the compensatory measures identified by the risk assessments were appropriately performed. The selected maintenance activities included:

- 1A RHR system outage
- Unit 1 RCIC out of service for condensate drain line repairs
- Unit 2 HPCI out of service for auxiliary oil pump preventive maintenance
- D21 emergency diesel generator (EDG) overhaul
- 10 bus load tap changer calibration
- 2B RHR system outage
- Unit 1 RCIC system outage

b. Findings

No findings of significance were identified.

1R14 Personnel Performance Related to Non-routine Plant Evolutions and Events (71111.14)

a. Inspection Scope

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

- Unit 2 power suppression testing, from the control room

- Unit 1 unplanned closure of the #4 turbine control valve

Reactor Trips. On April 23, 2003, Unit 1 shut down automatically due to reactor low level and a loss of feedwater. 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:

- T-101, "RPV Control"
- GP-18, "Post-Scram Review"
- T-100, "Scram/Scram Recovery"

Exelon determined that the event most likely was caused by an operator inadvertently contacting a control panel for the deep bed condensate demineralizers.

b. Findings

No findings of significance were identified.

1R15 Operability Evaluations (71111.15)

a. Inspection Scope

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

- D13 emergency diesel generator brush holder cracks (CR153234)
- Unit 1 control rod channel bow (CR155684, CR150093)
- Unit 2 "A" inboard MSIV - apparent delay in the start of valve closure (A1408342)
- 2B RHR heat exchanger operability with high levels of soluble manganese in the spray pond (CR159169)
- Incorrect oil added to D23 governor (A1420443)

b. Findings

No findings of significance were identified.

1R16 Operator Workarounds (71111.16)

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.

b. Findings

No findings of significance were identified.

1R19 Post-Maintenance Testing (71111.19)

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 TS requirements. The inspectors reviewed the recorded test data to determine whether the acceptance criteria were satisfied. The maintenance activities reviewed included:

- Unit 1 RCIC system outage valve work
- Unit 1 HPCI system outage
- Unit 2 "B" RHR system outage
- Unit 2 #3 APRM calibration and functional check following a circuit card replacement associated with 4 LRPM inputs
- Scram Discharge Volume vent and drain isolation valve pilot solenoid replacement
- D11 EDG jacket water leak

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

- CO205357, ST-2-074-428-2
- A1420745, ST-6-047-200-1, ST-6-107-201-0
- A1419800

b. Findings

No findings of significance were identified.

1R22 Surveillance Testing (71111.22)

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 TS requirements, and were capable of performing the design basis functions. The observed or reviewed surveillance tests included:

- ST-2-043-800-2, Recirculation Pump Breaker Arc Suppression Response Time
- ST-6-041-202-2, MSIV Cold Shutdown Valve Test
- ST-2-072-103-2, Rev.8 Div. III NSSS Logic System Functional Test
- ST-4-095-962-2, Safeguard Battery Charger 24 Month Load Test
- ST-6-047-200-1, SDV valve exercise test and ST-6-107-201-0 inservice test (IST) valve stroke for new baseline
- ST-2-055-100-2, HPCI Logic System Functional: Simulated Automatic Actuation

1. Unacceptable Preconditioning of Recirculation Pump Trip Breakers and Safety-Related Battery Chargers

a. Inspection Scope

NRC Inspection Report 50-352; 353/03-02 discussed a finding related to preconditioning of main steam isolation valves (MSIVs). After identifying this issue, the inspectors noted that the practice of performing preventive maintenance prior to TS surveillance testing for recirculation pump trip (RPT) breakers and safety-related battery chargers was similar to that for MSIVs. Therefore, the inspectors questioned whether Exelon may also be preconditioning these components. RPT breakers are part of the RPT protective system that limits the consequences of an anticipated transient without scram event and certain turbine trip and generator load reject events.

The inspectors reviewed surveillance testing for RPT breakers and safety-related battery chargers. The inspectors also noted the order in which outage preventive maintenance and testing activities for these components were performed.

The inspectors reviewed the documents listed in the Attachment and discussed this issue with engineering and maintenance personnel.

b. Findings

Introduction. The inspectors identified a finding of very low significance (Green) because Exelon's practice of performing preventive maintenance prior to required surveillance testing of recirculation pump trip breakers and safety-related battery chargers masked the as-found conditions of these components, and this practice had not been evaluated.

Description. The inspectors noted that the preventive maintenance and subsequent test sequences for RPT breakers and battery chargers were not consistent with the sequence discussed in Information Notice (IN) 97-16, "Preconditioning of Plant Structures, Systems, and Components Before ASME Code In-Service Testing or Technical Specification Surveillance Testing," and NRC Inspection Manual (IM) Part 9900 guidance regarding preconditioning. The inspectors identified that the preventive maintenance performed on these components prior to testing preconditioned them and, as a result, masked the as-found condition.

In the case of the RPT breakers, Exelon has routinely changed out the breakers prior to response time testing required by TS 4.3.4.2.4. Exelon had not evaluated whether it was acceptable, from a preconditioning viewpoint, to perform the change-out prior to the required surveillance test.

Similarly, for safety-related battery chargers, Exelon routinely performed preventive maintenance prior to the 24-month surveillance tests. The scope of the preventive maintenance procedure, M-095-006, included adjustment or replacement of battery charger components that could affect the ability of the battery charger to meet TS requirements. For example, during the Unit 2 outage in March 2003, Exelon replaced the 2BCA2 battery charger current limit card during maintenance activities prior to the 24-month surveillance test, and as-found data for the current limit was not taken. Thus, Exelon could not demonstrate that the battery chargers would have supplied the 300 amp current required by TS 4.8.2.1.d.1 for the preceding 24-month surveillance interval.

Following discussions with the inspectors, Exelon concluded that their practices constituted unacceptable preconditioning. Exelon initiated CRs to address these practices.

Analysis. Not performing as-found surveillance tests on RPT breakers and safety-related battery chargers is a performance deficiency, since the practice of performing maintenance prior to testing these components is not consistent with IN 97-16 and IM Part 9900. Traditional enforcement does not apply, because the issue did not have any actual safety consequences or potential for impacting the NRC's regulatory function and was not the result of any willful violation of NRC requirements or Exelon procedures. The finding was considered more than minor, in that the issue was associated with the Equipment Performance (reliability) attribute of the Mitigating Systems cornerstone, and it affected the cornerstone objective. The Mitigating Systems cornerstone objective was affected because the failure to conduct as-found testing masks any component

degradation which would adversely impact the reliability of the RPT breakers and battery chargers to respond to initiating events and prevent undesirable consequences. This finding was determined to be of very low safety significance (Green) by Phase 1 of the Reactor Inspection Findings for At-Power Situations Significance Determination Process, because the issue involved inadequate testing and did not degrade the capability of these components to perform their safety function.

The inspectors also identified that a contributing cause of this finding was related to the cross-cutting area of Problem Identification and Resolution. After the inspectors noted the MSIV preconditioning issue in February 2003, Exelon's corrective actions included a review of other outage-related activities for unacceptable preconditioning. Exelon's corrective action review was narrow in scope and did not identify the RPT breaker and battery charger preconditioning issues.

Enforcement. The inspectors concluded that the testing performance deficiencies discussed above did not constitute a violation of regulatory requirements because IN 97-16 and IM Part 9900 are not regulatory requirements. This issue is documented in Exelon's corrective action program as CRs 146966, 162284, and 162698. **(FIN 05000352; 353/2003003-01)**

2. Adequacy of Testing for Main Steam Isolation Valves

a. Inspection Scope

The inspectors evaluated and compared surveillance test data with established acceptance criteria to verify the MSIVs were capable of performing their intended safety functions. The inspectors also reviewed the test method and validity of the acceptance criteria to ensure that the test verified that the MSIVs met TS requirements and were capable of performing their design basis functions.

The inspector also reviewed the documents listed in the Attachment.

b. Findings

Introduction. The inspectors identified a finding of very low significance (Green) that is also a violation of 10 CFR 50 Appendix B, Criterion XI, "Test Control," because Exelon's MSIV stroke time test procedure did not include sufficient steps to assure that, when the MSIVs are in-service in Operational Conditions 1, the MSIV full closure times will meet technical specification requirements.

Description. The plant Technical Specifications TS 3.4.7 requires two MSIVs per main steam line to be operable with closing times greater than or equal to 3 seconds and less than or equal to 5 seconds for Operational Conditions 1, 2, and 3. In accordance with the Limerick design bases, the 3 second value is used to perform the reactor coolant boundary over-pressure analysis and assure boundary integrity is maintained. The 5 second value is used to perform other analyses, including the main steam line break

analysis. TS 4.4.7 requires that Exelon perform full closure surveillance tests of the MSIVs. Test procedure ST-6-041-202-2 “MSIV Cold Shutdown Valve Test,” Revision 11 is Exelon’s test to meet the surveillance test requirements.

The inspector concluded that Exelon’s test procedure ST-6-041-202-2 was inadequate, in that, the procedure did not include sufficient steps to determine that the MSIV full closure time would be between 3 and 5 seconds when the plant is in Operational Condition 1. The procedure provided for measuring the time between movement of the valve hand switch to close and the valve position indicating light indicating closed in Operational Condition 4 or 5. Since this procedure did not provide for direct measurement of the valve closure time while in Operational Conditions 1, correction factors need to be established to correlate actual test conditions to in-service conditions of the MSIVs in Operational Conditions 1. Correction factors such as those used to correct from the cold shutdown test condition (Operational Condition 4 or 5) to hot conditions (Operational Condition 1) were not clearly established and included in the procedure. The procedure also did not clearly establish other correction factors that should be applied to the test data in order to accurately determine valve closure time. These missing factors included: a factor to address the delay in valve initial movement after the valve hand switch was taken to close (pneumatic delay time), a factor to address the steam flow affect on valve movement, and a factor to address the time from the close limit switch indication to actual valve full closure. These procedural inadequacies were discussed with Exelon staff. Exelon is performing a detailed technical and engineering analysis to either modify the test procedure to provide for a more accurate methodology or to establish appropriate test data correction factors in the test procedure.

Analysis. Not having an adequate test procedure for performing testing that demonstrates the MSIVs can meet Technical Specification is a performance deficiency, because it is contrary to the requirements of 10 CFR 50 Appendix B, Criterion XI. Traditional enforcement does not apply, because the issue did not have any actual safety consequences or potential for impacting the NRC’s regulatory function and was not the result of any willful violation of NRC requirements or Exelon procedures. The finding was considered more than minor, in that the issue was associated with the Maintain Functionality of Containment Procedure Quality attribute of the Barrier Integrity cornerstone, and it affected the cornerstone objective. The Barrier Integrity cornerstone objective was affected because the inadequate testing procedures adversely affect assurance that the containment would protect the public from radionuclide releases caused by accidents or events. This finding was also associated with the Procedure Quality attribute of the Mitigating Systems cornerstone, and it affected the cornerstone objective. The cornerstone objective was affected because the testing did not ensure the reliability of the MSIV’s to respond to initiating events to prevent undesirable consequences.

This finding was determined to have very low safety significance (Green) by Phase 2 of the Reactor Inspection Findings for At-Power Situations Significance Determination Process. Phase 1 of the Significance Determination Process screened this finding to

Phase 2 because more than one cornerstone was affected. This finding was determined to be of very low safety significance because the issue involved inadequate testing and did not degrade the MSIVs capability to perform its safety function. Therefore, no mitigation equipment or sequences in Phase 2 were adversely impacted.

Enforcement. 10 CFR 50 Appendix B, Criterion XI, "Test Control," requires testing to demonstrate that structures, systems, and components will perform satisfactorily in-service. Contrary to the above, Exelon MSIV test procedure ST-6-041-202-2 "MSIV Cold Shutdown Valve Test," Revision 11 did not include sufficient steps to determine that the MSIV full closure time will meet technical specifications when the MSIVs are in-service in Operational Conditions 1. Specifically the procedure did not use appropriate correction factors to account for the differences in test conditions (Operational Condition 4 or 5) and MSIV in-service conditions (Operational Condition 1). Because this inadequate procedure is of very low safety significance and has been entered into Exelon's corrective action program as CR 147485, this violation is being treated as an NCV consistent with Section VI.A of the NRC Enforcement Policy. **(NCV 05000352; 353/2003003-02)**

1R23 Temporary Plant Modifications (71111.23)

a. Inspection Scope

The inspector reviewed the following temporary plant modification:

- One of three Unit 2 main turbine trip inputs associated with the moisture separator high-high level trip logic disabled, due to a failed level switch. (TCC 03-00192)

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.

Documents Reviewed

- Temporary Configuration Change 03-00192
- Maintenance Work Order C0204766

b. Findings

No findings of significance were identified.

Cornerstone: Emergency Preparedness [EP]

1EP6 Drill Evaluation (71114.06)

a. Inspection Scope

The inspectors evaluated an emergency preparedness exercise on May 13, 2003. The inspectors also observed and evaluated an emergency preparedness drill on May 27, 2003. The inspectors reviewed the scenarios to identify the timing and location of classification, notification and Protective Action Recommendation (PAR) development activities. During the drill and exercise, the inspectors reviewed checklists and forms used for classification, notification and PAR activities, and compared them to the criteria in Exelon's Emergency Plan, EP-AA-1000, and supporting procedures.

b. Findings

No findings of significance were identified.

2. RADIATION SAFETY

Cornerstone: Occupational Radiation Safety

2OS1 Access Controls to Radiologically Significant Areas

a. Inspection Scope

The inspector reviewed the radiation protection access control program by examining the controls established for exposure significant areas, including postings, barricades, locking controls, radiological briefings, and radiation protection technician coverage of workers. Specifically, on May 12, 2003, the inspector observed maintenance on the Unit 2 "D" residual heat removal pump located inside a high radiation area. The inspector reviewed the high radiation area lock and key control program by reviewing applicable procedures, conducting a high radiation area key inventory, and testing all of the locked high radiation area doors in the plant between May 12 and 14, 2003. This review was with respect to the high radiation area entry requirements specified in Technical Specification 5.7 and 10 CFR 20.1601 and applicable radiation surveys.

b. Findings

No findings of significance were identified.

3. SAFEGUARDS

Cornerstone: Physical Protection [PP]

3PP4 Security Plan Changes (71130.04)

a. Inspection Scope

An in-office review was conducted of changes to the Physical Security Plan identified as Revision 15 and 16, and changes to the Training and Qualification Plan identified as Revision 5 and 6, submitted to the NRC on January 16, 2001 and January 22, 2001, in accordance with the provisions of 10 CFR 50.54(p). The review was conducted to confirm that the changes were made in accordance with 10 CFR 50.54(p), and did not decrease the effectiveness of the above listed plans. The NRC recognizes that some requirements contained in these program plans may have been superceded by the February 2001 Interim Compensatory Measures Order.

An in-office review was conducted of changes to the Safeguards Contingency Plan identified as Revision 3 and 4, submitted to the NRC on January 16, 2001 and January 22, 2001, in accordance with the provisions of 10 CFR 50.54(p). The review was conducted to confirm that the changes were made in accordance with 10 CFR 50.54(p), and did not decrease the effectiveness of the above listed plans. The NRC recognizes that some requirements contained in these program plans may have been superceded by the February 2002 Interim Compensatory Measures Order.

An in-office review was conducted of changes to the licensee's Physical Security Plan, identified as Revision 17 and 18, and the licensee's Training and Qualification Plan identified as Revision 7. These documents were submitted to the NRC on July 2, 2002, and April 25, 2003, in accordance with the provisions of 10 CFR 50.54(p). The review was conducted to confirm that the changes were made in accordance with 10 CFR 50.54(p), and did not decrease the effectiveness of the above listed plans. The NRC recognizes that some requirements contained in these Plans may have been superceded by the February 2002 Interim Compensatory Measures Order.

b. Findings

No findings of significance were identified.

4. OTHER ACTIVITIES [OA]

4OA1 Performance Indicator Verification (71151)

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. 1, 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:

- Unplanned scrams (April 1, 2002 to March 31, 2003)
- Scrams with loss of normal heat removal (April 1, 2002 to March 31, 2003)

b. Findings

No findings of significance were identified.

4OA2 Identification and Resolution of Problems (71152)

1. Annual Sample Review

a. Inspection Scope

The inspector selected CR 108972 for detailed review. The CR was associated with a failure of the Unit 1 "A" reactor feed pump breaker to shut following a Unit 1 scram in May 2002. The inspector reviewed the report to ensure the full extent of the issue was identified, an appropriate evaluation was performed, and appropriate corrective actions were specified and prioritized. The inspectors evaluated the report against the requirements of Exelon's corrective action program procedure, LS-AA-125.

b. Findings and Observations

No findings of significance were identified.

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

Section 1R22 of the report describes a PI&R cross-cutting aspect of a finding for unacceptable preconditioning of battery chargers and RPT breakers.

3. Cornerstone: Occupational Radiation Safety

a. Inspection Scope

The inspector reviewed six Condition Reports (CRs) that were initiated from February through April 2003 that were associated with the occupational radiation safety cornerstone. In addition, five radiation protection department self-assessment reports that were issued between July and November 2002, were reviewed. The purpose of the review was to evaluate the licensee's effectiveness at properly identifying, characterizing, investigating and resolving problems in implementing the licensee's radiation protection program.

b. Findings

No findings of significance were identified.

4OA3 Event Followup (71153)

.1 (Closed) LER 05000352/1-03-001. Degraded Flood Barrier Due to Reactor Enclosure Dirty Radwaste Line Cleanout Plug Not Installed

On January 31, 2003, an engineer discovered that the cleanout plug was not properly installed in a dirty radwaste drain imbedded in the floor of the 1A/C residual heat removal pump room. Exelon re-installed the plug and then performed an investigation which determined that the plug was a required barrier necessary to prevent a flooding event from effecting the redundant RHR subsystems. The investigation also found that the plug was most likely installed improperly about eleven months earlier. The inspectors reviewed the LER and identified no findings of significance. Exelon documented the event in CR 142342. This LER is closed.

.2 (Closed) LER 05000353/2-03-001. Main Turbine High Vibration Manual Turbine Trip and Automatic Scram During Planning Shutdown

On March 3, 2003, an unplanned automatic reactor shutdown occurred as a result of a manual main turbine trip. The main turbine was tripped due to high vibration during a planned power reduction to enter a refueling outage. Exelon performed maintenance activities to resolve the cause of the high vibration. The inspectors reviewed the LER and identified no findings of significance. Exelon documented the event in CR 147279. This LER is closed.

.3 (Closed) LER 05000352/1-03-003. Unit 1 Scram due to Closure of the Deep Bed Condensate Demineralizer (DBCD) Inlet Header Block Valve

On April 23, 2003, an unplanned automatic reactor shutdown occurred as a result of a reactor low level condition. All three reactor feed pumps tripped on low suction pressure due to closure of the deep bed condensate demineralizer inlet block valve. The low level condition also resulted in actuation of the HPCI system, RCIC system, and primary containment isolation valves. Exelon determined that the event most likely was caused by an operator inadvertently contacting a control panel for the deep bed condensate demineralizers. Exelon revised operating procedures to maintain the demineralizer inlet block valve open and deenergized. The inspectors reviewed the LER and identified no findings of significance. Exelon documented the event in CR 155365. This LER is closed.

4OA5 Other Activities

The inspector reviewed the Institute of Nuclear Power Operations (INPO) final report, issued April 8, 2003, that documented the results of the 2 week INPO inspection conducted January 27, 2003 through February 7, 2003.

4OA6 Meetings, Including Exit

The inspectors presented the inspection results to Mr. Levis and other members of station management on July 2, 2003.

The inspectors asked Exelon whether any materials examined during the inspections should be considered proprietary. No proprietary information was identified.

ATTACHMENT: SUPPLEMENTAL INFORMATION

SUPPLEMENTAL INFORMATION

KEY POINTS OF CONTACT

Exelon Generation Company

E. Callan	Director - Operations
T. Dougherty	Shift Operations Superintendent
B. Hanson	Plant Manager
J. Krais	Senior Manager - Design Engineering
W. Levis	Site Vice President
C. Mudrick	Director - Engineering

LIST OF ITEMS OPENED, CLOSED, AND DISCUSSED

Opened and Closed

05000352;353/2003003-01	FIN	Unacceptable Preconditioning of Recirculation Pump Trip Breakers and Safety-Related Battery Chargers (Section 1R22)
05000352;353/2003003-02	NCV	Adequacy of Testing for Main Steam Isolation Valves (Section 1R22)

Closed

05000352/1-03-001	LER	Degraded Flood Barrier Due to Reactor Enclosure Dirty Radwaste Line Cleanout Plug Not Installed
05000353/2-03-001	LER	Main Turbine High Vibration Manual Turbine Trip and Automatic Scram During Planning Shutdown
05000352/1-03-003	LER	Unit 1 Scram due to Closure of the Deep Bed Condensate Demineralizer (DBCD) Inlet Header Block Valve

LIST OF DOCUMENTS REVIEWED

Section1R04: Equipment Alignment

Procedures and Documents

- UFSAR Section 6.2.2
- Piping and Instrumentation Diagram 8031-M-51, "Unit 1 Residual Heat Removal" Procedure 1S51.1 A (COL-1) "Equipment Alignment for Automatic Operation of the RHR System in the Low Pressure Coolant Injection (LPCI) Mode - "A" Subsystem"
- Procedure 1S51.1 A (COL-2) "Equipment Alignment for Automatic Operation of the RHR System in the LPCI Mode - "B" Subsystem"
- Procedure S51.1A "Set Up of RHR System for Automatic Operation in the LPCI Mode"
- Procedure S51.8A "Suppression Pool Cooling Operation (Startup and Shutdown) and Level Control"
- Procedure S51.4C "RHR Venting"
- Unit 1 Residual Heat Removal System Health Report
- Condition Reports - 00140284, 00141528, 00142097, 00142874, 00155442

Section 1R11: Licensed Operator Requalification

Procedures

- OT-117, RPS Failures
- OT-104, Unexpected/Unexplained Positive or Negative Reactivity Insertion
- OT-102, Reactor High Pressure
- T-101, RPV Control
- T-102, Primary Containment Control
- T-117, Level/Power Control
- T-270, Terminate and Prevent Injection into the RPV

Section 1R22: Surveillance Testing

- Inspection Manual (IM) Part 9900 technical guidance (Maintenance - Preconditioning of Structures, Systems, and Components Before Determining Operability)
- Information Notice (IN) 97-16, "Preconditioning of Plant Structures, Systems, and Components Before ASME Code In-Service Testing or Technical Specification Surveillance Testing
- Procedure M-095-006, Preventive Maintenance Procedure for Battery Chargers
- ST-4-095-962-2, Safeguard Battery Charger 24 Month Load Test
- ST-2-043-800-2, Recirculation Pump Breaker Arc Suppression Response Time
- Exelon position paper on pre-conditioning of RPT breakers
- Exelon position paper on pre-conditioning of Battery Chargers
- Action Request A1310125
- CRs 146966, 162284, 162698
- Generic Letter 89-04, Guidance on Developing Acceptable Inservice Testing Programs

- Exelon Technical Evaluation A1408342
- Generic Letter 91-18, Information to Licensees Regarding NRC Inspection Manual Section on Resolution of Degraded and Nonconforming Conditions
- Design Specification ML-008
- 10 CFR 50 Appendix B, Criterion XI
- Condition Report 147485

Section 2OS1: Access Controls to Radiologically Significant Areas

Procedures: RP-AA-460, Rev. 2, "Controls for High and Very High Radiation Areas"; Health Physics Job Standard HPJS-7.28, "Requirements for the Control and Inventory of Locked High Radiation Areas and Keys"
Condition Reports: 148165, 148813, 148356, 148106, 144728, 155355
Radiation protection self-assessments: July-August 2002, Pre-INPO Readiness; August 2002, Radiological Postings and Labeling; September 2002, Source Term Reduction; September 2002, Respiratory Protection Program; October 2002, Advanced Radworker Performance; November 2002, Radiation Protection Instrumentation Program

LIST OF ACRONYMS

CFR	Code of Federal Regulations
CR	Condition Report
DBCD	Deep Bed Condensate Demineralizer
EDG	Emergency Diesel Generator
HPCI	High Pressure Coolant Injection
INPO	Institute of Nuclear Power Operations
ICMs	interim compensatory measures
IM	Inspection Manual
IN	Information Notice
IST	Inservice Test
Kv	Kilovolt
LER	Licensee Event Report
LPCI	Low Pressure Coolant Injection
MSIV	Main Steam Isolation Valve
NCV	Non-Cited Violation
PI	Performance Indicator
RPT	Recirculation Pump Trip
RPV	Reactor Pressure Vessel
SDP	Significance Determination Process
RCIC	Reactor Core Isolation Coolant
RHR	Residual Heat Removal
SSC	System, structure, or component
TS	Technical Specification
UFSAR	Updated Final Safety Analysis Report