



UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION I
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November 13, 2007

Mr. Charles G. Pardee
President and CNO
Exelon Nuclear
Exelon Generation Company, LLC
200 Exelon Way
Kennett Square, PA 19348

SUBJECT: LIMERICK GENERATING STATION - NRC INTEGRATED INSPECTION
REPORT 05000352/2007004 AND 05000353/2007004

Dear Mr. Pardee:

On September 30, 2007, the U. S. Nuclear Regulatory Commission (NRC) completed an inspection at your Limerick Generating Station Units 1 and 2. The enclosed integrated inspection report documents the inspection results which were discussed on October 15, 2007, with Mr. E. Callan and other members of your staff.

The 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.

Based on the results of this inspection, no findings of significance were identified.

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 Website at <http://www.nrc.gov/reading-rm/adams.html> (the Public Electronic Reading Room).

Sincerely,

/RA/

Paul G. Krohn, Chief
Projects Branch 4
Division of Reactor Projects

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

Enclosure: Inspection Report 05000352/2007004 and 05000353/2007004
w/Attachment: Supplemental Information

cc w/encl:

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Sincerely,

Paul G. Krohn, Chief */ra/*
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U.S. NUCLEAR REGULATORY COMMISSION

REGION 1

Docket Nos: 50-352, 50-353

License Nos: NPF-39, NPF-85

Report No: 05000352/2007004 and 05000353/2007004

Licensee: Exelon Generation Company, LLC

Facility: Limerick Generating Station, Units 1 & 2

Location: Sanatoga, PA 19464

Dates: July 1, 2007 through September 30, 2007

Inspectors: S. Hansell, Senior Resident Inspector
C. Bickett, Resident Inspector
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Approved by: Paul G. Krohn, Chief
Projects Branch 4
Division of Reactor Projects

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SUMMARY OF FINDINGS

IR 05000352/2007-004, 05000353/2007-004; 07/01/2007 - 09/30/2007; Limerick Generating Station, Units 1 and 2; Routine Integrated Report.

The report covered a three-month period of inspection by resident inspectors and announced inspections by reactor inspectors. The NRC's program for overseeing the safe operation of commercial nuclear power reactors is described in NUREG-1649, "Reactor Oversight," Revision 4, dated December 2006.

A. NRC-Identified and Self-Revealing Findings

No findings of significance were identified.

B. Licensee-Identified Violations

None.

REPORT DETAILS

Summary of Plant Status

Unit 1 began this inspection period operating at full rated thermal power. On August 16, 2007, reactor power was reduced to 20 percent and the main generator was removed from service to repair the generator output number 11 disconnect switch. On August 17, 2007, the disconnect switch repairs were completed and the main generator was returned to service. Unit 1 returned to 100 percent power on August 18, 2007. With the exception of a planned end of summer load drop to 85 percent power on September 8, 2007, Unit 1 remained at full power for the remainder of the period.

Unit 2 began this inspection period operating at full rated thermal power. On August 6, 2007, reactor power decreased to 75 percent due to an unplanned speed reduction on the 2B reactor recirculation pump. The pump speed change was due to a recirculation motor generator electronic card failure. The card was replaced and Unit 2 was returned to 100 percent power later in the day. With the exception of a planned end of summer load drop to 60 percent power on September 15, 2007, Unit 2 remained at full power for the remainder of the period.

1. REACTOR SAFETY

Cornerstones: Initiating Events, Mitigating Systems, and Barrier Integrity

1R01 Adverse Weather Protection (71111.01 - 1 system sample)

a. Inspection Scope

The inspectors evaluated Exelon's preparations and protection for summer weather. On July 10, 2007, the inspectors walked down Unit 1 and Unit 2 main generators and main transformers during hot weather and a grid heavy load voltage condition. The documents reviewed are listed in the Attachment.

b. Findings

No findings of significance were identified.

1R04 Equipment Alignment (71111.04)

.1 Partial Walkdown (71111.04Q - 4 samples)

a. Inspection Scope

The inspectors performed four partial walkdowns of plant systems to verify the operability of redundant or diverse trains and components when safety equipment in the opposite train was either inoperable, undergoing surveillance testing, or potentially degraded. The inspectors used plant Technical Specifications (TS), Exelon operating procedures, plant piping and instrumentation drawings (P&IDs), and the Updated Final Safety Analysis Report (USFAR) as guidance for conducting partial system walkdowns. The inspectors reviewed the alignment of system valves and electrical breakers to ensure proper in-service or standby configurations as described in plant procedures and drawings.

During the walkdown, the inspectors evaluated material condition and general housekeeping of the system and adjacent spaces. The documents reviewed are listed in the Attachment. The inspectors performed walkdowns of the following systems:

- Unit 1 High Pressure Coolant Injection (HPCI) system;
- Unit 1 D-13 Emergency Diesel Generator (EDG);
- Unit 1 Standby Liquid Control System; and
- Unit 1 Reactor Core Isolation Cooling (RCIC).

.2 Complete System Walkdown (71111.04S - 1 sample)

The inspectors conducted one complete walkdown of the Unit 1 and Unit 2 Control Rod Drive (CRD) systems to verify functional capability of the system. The inspectors used plant TS, Exelon operating procedures, P&IDs, the UFSAR, and past surveillance tests as guidance for conducting the complete system walkdown. The inspectors reviewed the alignment of system valves, position of electrical breakers and settings of the system flow controller to ensure proper system configuration as described in plant procedures and drawings. During the walkdown, the inspectors evaluated the material condition and general housekeeping of the system and open issue reports associated with the system. The walkdown also included an evaluation of system piping, supports, and component foundations to ensure they were not degraded. The documents reviewed are listed in the Attachment.

b. Findings

No findings of significance were identified.

1R05 Fire Protection

.1 Fire Protection - Tours (71111.05Q - 8 samples)

a. Inspection Scope

The inspectors conducted a tour of the eight areas listed below to assess the material condition and operational status of fire protection features. The inspectors verified that combustibles and ignition sources were controlled in accordance with Exelon's administrative procedures, fire detection and suppression equipment was available for use, and that passive fire barriers were maintained in good material condition. The inspectors also verified that station personnel implemented compensatory measures for out-of-service, degraded, or inoperable fire protection equipment in accordance with Exelon's fire plan. The documents reviewed are listed in the Attachment. The inspectors performed the following samples:

- Main Control Room and peripheral rooms;
- Unit 1 Refuel Floor;
- Unit 2 Refuel Floor;
- Unit 1 220 KV Switchyard;
- Unit 1 and Unit 2 Static Inverter compartments;
- Unit 1 and Unit 2 Standby Gas Treatment system filter compartments and access area;

- Control Room Structure fan room, Elevation 304; and
- Unit 1 D14 Diesel Generator Room.

.2 Fire Protection - Drill Observation (71111.05A - 1 sample)

a. Inspection Scope

The inspectors observed one unannounced fire drill conducted in the Unit 1 air compressor, electro-hydraulic control (EHC) power unit, and turbine lubricating oil storage tank area on September 26, 2007. The inspectors observed the drill to evaluate the readiness of the plant fire brigade to fight fires. The documents reviewed are listed in the Attachment. Specific attributes evaluated were:

- Proper donning of fire fighting turnout gear and self-contained breathing apparatus (SCBA);
- Proper use and layout of fire hoses;
- Employment of appropriate fire fighting techniques;
- Sufficient fire fighting equipment brought to the scene;
- Effectiveness of fire brigade leader communications, command, and control;
- Search for victims and propagation of fire into other plant areas;
- Smoke removal operations;
- Utilization of pre-planned strategies;
- Adherence to the pre-planned drill scenario; and
- Drill objectives.

b. Findings

No findings of significance were identified.

1R06 Flood Protection Measures (71111.06 - 1 sample)

Internal Flooding

a. Inspection Scope

The inspectors reviewed documents and inspected structures, systems, and components (SSCs) relative to the adequacy of internal flood protection measures for the Unit 1 HPCI room. The inspectors performed walkdowns of the relevant areas to verify the adequacy of flood mitigation doors and barriers, drainage systems, and other flood protection features. The documents reviewed are listed in the Attachment.

b. Findings

No findings of significance were identified.

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

Resident Inspector Quarterly Review (1 sample)

a. Inspection Scope

On August 28, 2007, the inspectors observed a licensed operator requalification simulator scenario. The scenario included a simulated spurious Division 1 Loss of Coolant Accident (LOCA) signal with failure of the D11 EDG to start and an unisolable reactor water cleanup leak, which resulted in a manual scram and emergency blowdown. The inspectors observed the performance of two operating crews responding to the same scenario. The inspectors assessed licensed operator performance, including operator critical tasks that measure operator actions required to ensure the safe operation of the reactor and protection of the nuclear fuel and primary containment barriers. The inspectors observed the training evaluators' critiques at the conclusion of each simulation. The documents reviewed are listed in the Attachment.

b. Findings

No findings of significance were identified.

1R12 Maintenance Effectiveness (71111.12 - 3 samples)

a. Inspection Scope

The inspectors evaluated Exelon's work practices and follow-up corrective actions for SSCs and identified issues to assess the effectiveness of Exelon's maintenance activities. The inspectors reviewed the performance history of risk significant SSCs and assessed Exelon's extent-of-condition determinations for those issues with potential common cause or generic implications to evaluate the adequacy of the station's corrective actions. The inspectors assessed Exelon's problem identification and resolution actions for these issues to evaluate whether Exelon had appropriately monitored, evaluated, and dispositioned the issues in accordance with Exelon procedures and the requirements of 10 CFR 50.65, "Requirements for Monitoring the Effectiveness of Maintenance." In addition, the inspectors reviewed selected SSC classifications, performance criteria and goals, and Exelon's corrective actions that were taken or planned, to evaluate whether the actions were reasonable and appropriate. The documents reviewed are listed in the Attachment. The inspectors performed the following samples:

- 1A post LOCA recombiner maintenance rule (a)(1) determination;
- 2B Turbine Enclosure Cooling Water heat exchanger system outage window; and
- Unit 2 High Pressure Coolant Injection maintenance rule (a)(1) determination.

1R13 Maintenance Risk Assessments and Emergent Work Control (71111.13 - 8 samples)

a. Inspection Scope

The inspectors evaluated the effectiveness of Exelon's maintenance risk assessments required by 10 CFR 50.65 (a)(4). This inspection included discussion with control room operators and risk analysis personnel regarding the use of Exelon's on-line risk monitoring software. The inspectors reviewed equipment tracking documentation, daily work schedules, and performed plant tours to gain assurance that the actual plant configuration matched the assessed configuration. Additionally, the inspectors verified that Exelon's risk management actions, for both planned and emergent work, were

consistent with those described in Exelon procedure, ER-AA-600-1042, "On-Line Risk Management." The documents reviewed are listed in the Attachment. Inspectors reviewed risk assessments for the following issues:

- Incorrect interpretation of ASME Code Case N-435-1;
- Unit 1 HPCI room temperature high;
- Unit 2 Reactor Recirculation Motor Generator runback to minimum speed;
- Unit 1 Main Generator Disconnect high temperatures;
- Unit 1 Main Generator Disconnect phases A and C jumper installation;
- Large VAR (Volt-Ampere Reactive) swings during EDG run;
- Unit 2 placing alternate steam jet air ejector in service; and
- Unit 1 "D" Safety Relief Valve position indicator converter module replacement.

b. Findings

No findings of significance were identified.

1R15 Operability Evaluations (71111.15 - 5 samples)

a. Inspection Scope

For the five operability evaluations described below, the inspectors assessed the technical adequacy of the evaluations to ensure that Exelon properly justified TS operability and verified that the subject component or system remained available such that no unrecognized increase in risk occurred. The inspectors reviewed the UFSAR to verify that the system or component remained available to perform its intended safety function. In addition, the inspectors reviewed compensatory measures implemented to ensure that the measures worked and were adequately controlled. The inspectors also reviewed a sample of issue reports (IRs) to verify that Exelon identified and corrected deficiencies associated with operability evaluations. The documents reviewed are listed in the Attachment. The inspectors reviewed operability evaluations for the following components:

- Unit 2 HPCI HV-055-2F006;
- Unit 1 HPCI Room Cooler;
- Unit 2 Reactor Core Isolation Cooling Pump Suction High Pressure Alarm;
- Unit 2 HPCI Oil Pressure; and
- Unit 2B Reactor Circulation Pump mechanical seal.

b. Findings

No findings of significance were identified.

1R19 Post-Maintenance Testing (71111.19 - 8 samples)

a. Inspection Scope

The inspectors reviewed the eight post-maintenance tests (PMTs) listed below to verify that procedures and test activities ensured system operability and functional capability. The inspectors reviewed Exelon's test procedures to verify that the procedures

adequately tested the safety functions that may have been affected by the maintenance activity, and that the applicable criteria in the procedures were consistent with information in the licensing and design basis documents. The inspectors also witnessed the test or reviewed test data to verify that the results adequately demonstrated restoration of the affected safety functions. The documents reviewed are listed in the Attachment. The inspectors reviewed post-maintenance tests for the following systems and components:

- “C” Residual Heat Removal Service Water pump;
- “2A” RHR Suppression Pool Cooling Valve;
- “D” Emergency Diesel Generator;
- D21 Diesel Generator;
- Unit 1 “A” Standby Liquid Control Squib Valve;
- Unit 1 Reactor Core Isolation Cooling Flow Controller;
- Unit 2 Reactor Core Isolation Cooling Outboard Steam Isolation Valve; and
- Unit 2 Redundant Reactivity Control System (RRCS).

b. Findings

No findings of significance were identified.

1R22 Surveillance Testing (71111.22 - 5 samples)

a. Inspection Scope

The inspectors witnessed the performance and reviewed test data for five surveillance tests that are associated with selected risk-significant SSCs. The review verified that Exelon personnel followed TS requirements and that acceptance criteria were appropriate. The inspectors also verified that the station established proper test conditions, as specified in the procedures, that no equipment preconditioning activities occurred, and that acceptance criteria had been met. The documents reviewed are listed in the Attachment. The inspectors reviewed the surveillance tests for the following systems and components:

- Unit 2 D24 EDG;
- Unit 2 Division 2 Lower Pressure Coolant Injection;
- Unit 2 Control Rods;
- Unit 1 High Pressure Coolant Injection Pump; and
- Unit 1 High Pressure Coolant Injection.

b. Findings

No findings of significance were identified.

1R23 Temporary Plant Modifications (71111.23 - 1 sample)

a. Inspection Scope

The inspectors reviewed and compared the temporary modification listed below with the UFSAR and TS to verify that the modification did not affect operability or availability of the Unit 1 reactor recirculation motor generator. The inspectors ensured that station

personnel implemented the modification in accordance with the applicable temporary configuration change process. The inspectors also reviewed the impact on existing procedures to verify appropriate revisions were made to reflect the temporary configuration change. Additionally, the inspectors evaluated the adequacy of proposed testing upon removal of the change. The documents reviewed are listed in the Attachment. The inspectors performed the following sample:

- TRT-D7-164, Install 1B Reactor Recirculation Pump Motor Generator Temporary Mechanical Stop.

b. Findings

No findings of significance were identified.

Cornerstone: Emergency Preparedness (EP)

1EP6 Drill Evaluation (71114.06 - 2 samples)

.1 General Emergency Classification due to Simulated Fuel Failure Coincident with Failed Open Main Steam Line Isolation Valves

a. Inspection Scope

On June 19, 2007, the inspectors observed an EP training drill in the control room simulator. The inspectors assessed Exelon's emergency response organization's (ERO) implementation of the Limerick emergency plan and implementing procedures, and the ERO's response to simulated degraded plant conditions to identify weaknesses and deficiencies in classification, notification, and protective action recommendation (PAR) development activities. In addition, the inspectors assessed licensed operator performance required to ensure the safe operation of the reactor and the protection of the nuclear fuel and primary containment barriers. The inspectors reviewed Exelon's training evaluators' critiques and the formal critique report, dated July 31, 2007, associated with the EP drill, to evaluate Exelon's identification of weaknesses and deficiencies. The inspectors compared inspector observed weaknesses with those identified in Exelon's formal drill critique to verify whether Exelon adequately identified weaknesses and deficiencies at an appropriate threshold. The documents reviewed are listed in the Attachment.

b. Findings

No findings of significance were identified.

.2 Site Area Emergency Classification Due to a Simulated Reactor Coolant System Leak in the Reactor Building

a. Inspection Scope

The inspectors observed a licensed operator requalification simulator exercise evaluation to identify the timing and adequacy of classification, notification, and PAR development activities. During the simulator evaluation, the inspectors reviewed checklists and forms

used for classification and notification activities, and compared them to the criteria in Exelon's Emergency Plan, EP-MA-114-100-F-01, "State/Local Event Notification Form," and supporting procedures. The documents reviewed are listed in the Attachment.

b. Findings

No findings of significance were identified.

2. OTHER ACTIVITIES

4OA1 Performance Indicator (PI) Verification (71151- 8 samples)

1. Inspection Scope

The inspector sampled Exelon's submittal of the performance indicators listed below to verify the accuracy of the data recorded from the third quarter of 2006 through the third quarter of 2007. The inspectors utilized performance indicator definitions and guidance contained in Nuclear Energy Institute (NEI) 99-02, "Regulatory Assessment Performance Indicator Guideline," Revision 5, to verify the basis in reporting for each data element. The inspectors reviewed various documents, including portions of main control room logs, issue reports, power history curves, work orders, and system derivation reports. The inspectors also discussed the method for compiling and reporting performance indicators with cognizant engineering personnel and compared graphical representations from the most recent PI report to the raw data to verify that the report correctly reflected the data. The documents reviewed are listed in the Attachment.

Cornerstone: Initiating Events (2 samples)

- Unit 1 Unplanned Power Changes per 7000 Critical Hours; and
- Unit 2 Unplanned Power Changes per 7000 Critical Hours.

Cornerstone: Mitigating Systems (6 samples)

- Unit 1 High Pressure Coolant Injection system;
- Unit 2 High Pressure Coolant Injection system;
- Unit 1 Reactor Core Isolation Cooling system;
- Unit 2 Reactor Core Isolation Cooling system;
- Unit 1 Emergency Diesel Generators; and
- Unit 2 Emergency Diesel Generators.

b. Findings

No findings of significance were identified.

4OA2 Identification and Resolution of Problems (71152)

Review of Items Entered into the Corrective Action Program (CAP)

As required by Inspection Procedure 71152, "Identification and Resolution of Problems," and in order to help identify repetitive equipment failures or specific human performance issues for follow-up, the inspectors performed a screening of all items entered into Limerick's CAP. The inspectors accomplished this by reviewing the description of each new issue report and accessing Exelon's computerized database. The documents reviewed are listed in the Attachment.

b. Findings

No findings of significance were identified. The inspectors observed that issues selected for review were appropriately categorized and prioritized in accordance with Exelon's corrective action process.

4OA3 Event Followup (71153)

.1 Unit 1 Main Generator Output Switchyard Disconnect Removal from Service due to High Temperature

a. Inspection Scope

On August 16, 2007, the inspectors responded to the plant due to a high temperature on the Unit 1 main generator output disconnect. The inspectors discussed the switchyard disconnect problem with operations personnel, engineering personnel, and Exelon management to gain an understanding of Exelon's response and follow-up actions. The inspectors reviewed troubleshooting activities, the disconnect temperature surveillance monitoring, and the planned actions to repair and correct the disconnect high temperature condition.

The number 11 disconnect is located on the output of the Unit 1 main transformers and is physically located in the Unit 1 220 kilovolt (kV) switchyard. The disconnect is comprised of three individual disconnects and associated bus bars. The disconnect "B" phase temperature reached a maximum value of 375 degrees Celsius and resulted in reactor power reductions to lower the temperature. The location of the elevated temperature was at the movable hinged section of the disconnect. The "A" and "C" phase temperatures were 95 to 100 degrees Celsius. The "B" phase high temperature was discovered during ongoing monthly temperature monitoring.

In response to the high temperature, operators reduced reactor power from 100 percent down to 25 percent to reduce the disconnect temperature and support removal of the main generator and disconnect from service to perform repairs. The inspectors observed "just-in-time training" in the simulator that was given to the operators prior to removing the main generator and disconnect from service. The inspectors also observed the operators' removal of the main generator and disconnect from service to support repairs. After removal from service, the "B" phase disconnect was rebuilt and tested satisfactorily prior to being returned to service. The main generator was placed back in service and the plant was returned to 100 percent power. The documents reviewed are listed in the Attachment.

b. Findings

No findings of significance were identified.

.2 (Closed) LER 05000353/02007-001, Scram Discharge Volume Vent and Drain Valves Failed Open Due to Clearance Tagging Error

On March 10, 2007, Limerick Unit 2 was in hot shutdown and depressurized to approximately 25 psig for the 2R09 refueling outage. A full scram signal was present and the scram discharge volume (SDV) was isolated, as designed. Operators were in the process of applying a clearance in preparation for planned maintenance on the Reactor Protection System and the scram air header. As part of this clearance, operators removed the Reactor Protection System backup scram fuses which ultimately resulted in the SDV vent and drain valves opening unexpectedly. Water from the SDV began to vent through these open valves into the plant drain system. Station personnel discovered the condition and closed the SDV vent and drain valves, stopping the source of the water. Further investigation by the station determined that the inadvertent opening of the SDV vent and drain valves was due to an improperly written clearance.

A non-cited violation (NCV) associated with this issue was documented in Section 1R20 of NRC integrated inspection report 05000352/2007002 and 05000353/2007002. The inspectors reviewed this LER and did not identify any additional findings of significance. Exelon documented this event and associated corrective actions in IR 602042. The documents reviewed are listed in the Attachment. This LER is closed.

.3 (Closed) LER 05000353/02007-002, Valid Actuation of Main Condenser Low Vacuum Isolation Logic During Outage

On March 12, 2007, operators were in the process of lowering vacuum on Limerick Unit 2 as part of refueling outage activities in accordance with procedure S07.2.A, "Shutdown of the Steam Jet Air Ejector and Breaking Main Condenser Vacuum." During this evolution, the main condenser low vacuum main steam isolation valve (MSIV) isolation logic actuated unexpectedly. Further investigation revealed that due to a procedural execution error, station personnel had only bypassed two of the required four channels of the isolation logic. Even though this resulted in actuation of two channels of logic when vacuum was lowered, no valves actually repositioned since the MSIVs and other affected valves were closed earlier as required by procedure. This failure to comply with procedure S07.2.A constitutes a violation of minor significance that is not subject to enforcement action in accordance with Section IV of the NRC's enforcement policy. The inspectors reviewed this LER and did not identify any additional findings of significance. Exelon documented this event and associated corrective actions in IR 602921. This LER is closed.

.4 (Closed) LER 05000353/02007-003, Automatic Actuation of the Reactor Protection System at Power

On April 24, 2007, the Unit 2 Reactor Protection System automatically actuated when reactor water level decreased from +35 inches to +12.5 inches. All control rods fully inserted. When reactor level decreased to the low-low level setpoint of -38 inches, both HPCI and RCIC systems initiated and injected into the vessel. HPCI and RCIC were placed in manual mode when flow oscillations were observed on both systems. Both systems were automatically secured when reactor level increased to +54 inches.

Exelon's investigation determined that a circuit card in Redundant Reactivity Control System (RRCS) Division 1, channel "B" spuriously actuated while channel "A" was in a tripped condition due to planned surveillance testing. This resulted in a feedwater runback. The feedwater runback reduced reactor level as expected.

Exelon's investigation determined that HPCI and RCIC flow oscillations were due to flow control loop tuning settings that did not properly account for differences in flow path testing conditions and vessel injection flow conditions. Station personnel replaced and successfully tested the affected RRCS circuit card. In addition the HPCI and RCIC flow controller gain and reset settings were adjusted to be consistent with Unit 1 settings, which are consistent with industry values and similar to previous Unit 2 settings when stable flow was demonstrated during Unit 2 initial startup testing. The procedure for tuning of HPCI and RCIC flow controls was revised to specify the required gain and reset settings.

The inspectors reviewed Exelon's apparent cause investigation, Unit 2 TS, and notification requirements. The apparent cause investigation determined that the HPCI and RCIC gain and reset settings were changed during system tuning in May 1999; therefore, this condition existed for approximately 8 years. This resulted in a condition that could have prevented the safety function of Unit 2 HPCI. A non-cited violation (NCV) associated with this issue was documented in Section IR19 of NRC integrated inspection report 05000352/2007003 and 05000353/2007003. Exelon documented this issue and its corrective actions in IR 620861. The review determined that Unit 1 was not affected. The inspectors reviewed the corrective actions, including revised procedures, and found no additional findings or unresolved issues. The documents reviewed are listed in the Attachment. This LER is closed.

4OA6 Meetings, Including Exit

Exit Meeting Summary

On October 15, 2007, the resident inspectors presented the inspection results to Mr. E. Callan and other members of his staff. The inspectors confirmed that proprietary information was not included in the inspection report.

ATTACHMENT: SUPPLEMENTAL INFORMATION

SUPPLEMENTAL INFORMATION**KEY POINTS OF CONTACT**Exelon Generation Company

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J. Broillet, Operations Shift Manager

LIST OF ITEMS OPENED, CLOSED, AND DISCUSSEDClosed

05000353/2007-001-0	LER	Scram Discharge Volume Vent and Drain Valves Failed Open due to Clearance Tagging Error (Section 40A3.2)
05000353/2007-002-0	LER	Valid Actuation of Main Condenser Low Vacuum Isolation Logic During Outage (Section 40A3.3)
05000353/2007-003	LER	Automatic Actuation of the Reactor Protection System at Power (Section 40A3.4)

Discussed

None

LIST OF DOCUMENTS REVIEWED

Section 1R01: Adverse Weather Protection

Procedures

OP-AA-108-107-1001, "Station Response to Grid Capacity Conditions," Revision 2
S32.3.A, "Main Generator Inspection During Heavy Grid Load," Revision 7

Section 1R04: Equipment Alignment

Procedures

Technical Specification 3/4 8.1, "A.C. Sources"
S92.9.N, "Routine Inspection of the Diesel Generators," Revision 53
1S46.1.A (COL), "Valve and Breaker Alignment for Start-up of the Control Rod Drive Hydraulic Supply System for Service"
ST-6-048-230-1, "SLC Pump, Valve, and Flow Test"
S49.3.A, "RCIC Fill and Vent," Revision 17
Troubleshooting, Rework, and Testing Control Form, TRT No. 07-174, RCIC Fill and Vent

Section 1R05: Fire Protection

Procedures

ARC-MCR-006 B1L, Fire Alarm Response Card, Revision 2
F-A-452, "Unit 1 Static Inverter Room, Fire Area 20," Revision 7
F-A-453, "Unit 2 Static Inverter Room, Fire Area 20," Revision 4
F-A-533, "Control Room 533 and Peripheral Rooms 530 to 535 (EL. 269) Fire Area 24,"
Revision 10
F-A-619, "Control Structure Fan Room (EL. 304) Fire Area 27," Revision 6
F-A-624, "Standby Gas Treatment Area Rooms 624 & 625, Fire Area 28," Revision 6
F-D-311D, "D14 Diesel Generator Room and Fuel Oil and Lube Oil Tank Room Rooms 311D
and 312D (EL. 217) Fire Area 82," Revision 5
F-T-328, "Unit 1 Air Compressor, EHC Power Unit, and Turbine Lube Oil Storage Tank Areas
Rooms 328, 330, and 331 (EL. 217) Fire Area 93," Revision 5
OP-AA-201-003, "Fire Drill Performance," Revision 8
SE-8, "Fire," Revision 31
ST-6-022-551-0, "Fire Drill," Revision 8, conducted on 9/26/07

Issue Reports and Action Requests (ARs)

IR 676038, "Fire Brigade Member EO Key Ring"
A1261436, "Evaluate Propping Open of Doors"

Miscellaneous

UFSAR Appendix 9A

Section 1R06: Flood Protection Measures

Procedures

SE-4, "Flood," Revision 5
SE-4-1, "Reactor Enclosure Flooding," Revision 8

Issue Reports and Action Requests

IR 634795, "Floor Drain Clogged in U/1 HPCI Room"

Miscellaneous

BLP-31981, "Moderate Energy Pipe Break (MEPB) Analysis," dated February 1984

NPB-14, "Moderate Energy Line Break," Revision 4

NPB-32, "Flooding of ECCS Compartments from the Suppression Pool," Revision 3

NPB-33, "Moderate Energy Pipe Break Report," Revision 3

Section 1R11: Licensed Operator Requalification Program

Procedures

EOP T-101, "RPV Control," Revision 20

EOP T-103, "Secondary Containment Control," Revision 17

EOP T-112, "Emergency Blowdown," Revision 12

EOP T-270, "Terminate and Prevent injection into RPV," Revision 12

Section 1R12: Maintenance Effectiveness

Procedures

ER-AA-310, "Implementation of the Maintenance Rule," Revision 6

ER-AA-310-1004, "Maintenance Rule - Performance Monitoring," Revision 5

ER-AA-310-1003, "Maintenance Rule - Performance Criteria Selection," Revision 3

ER-AA-310-1005, "Maintenance Rule - Dispositioning Between (a)(1) and (a)(2)," Revision 5

ER-LG-310-1010, "Maintenance Rule Implementation," Revision 7

ER-AA-310, "Implementation of the Maintenance Rule," Revision 6

Issue Reports and Action Requests

IR 483496, "TECW Unavailability Issues"

IR 637270, "Possible Maintenance Rule (a)(1) for Excessive TECW System Outage Window"

IR 642006, "2B TECW Heat Exchanger Unavailability Hours Exceeded"

IR 667927, "Document Unit 2 HPCI Maintenance Rule (a)(1) Determination"

IR 506692, "Points 3 & 5 Failing"

IR 546231, "1A Recombiner Valve FV-DO-101A Failed to Open"

IR 551504, "1A Post LOCA Recombiner MRule FF (A)(1) Determination"

Miscellaneous

Maintenance Rule Expert Panel Meeting Minutes, dated 11/01/2006, 11/30/2006

Maintenance Rule Expert Panel Meeting Minutes, dated 09/14/2000, 02/15/2001, 04/20/2006, 06/19/2007

Section 1R13: Maintenance Risk Assessments and Emergent Work Control

Procedures

ER-AA-600-1045, "Risk Assessments of Missed or Deficient Surveillances," Revision 0

S07.6.A, "Placing Alternate Steam Jet Air Ejector In Service," Revision 27

ST-2-041-661-1, "Safety Relief Valves - Safety Relief Valve Position Indicators Functional Test,"
Revision 12

Issue Reports and Action Requests

IR 598489, "D11 - Adjust Voltage Regulator Droop to 3% - 5%"

IR 601471, "ISI Inspection Volume for Code Case N-435"
IR 649698, "Incorrect Interpretation of ASME Code Case N-435-1"
IR 657596, "2B Reactor Recirculation MG Set Runback to Min Speed"
IR 668047, "Large VAR Swings During D12 D/G/ Run"
IR 674591, "SRV 'D' Position Indicator Functional Test Failed"
A1456726, "Excursion in KVAR and KW"
A1600437, "D12 Voltage Regulator VAR Swings When Paralleled to Offsite"
A1628762, "IR for Generation of Activity to Swap Unit 2 SJAE"
A1631597, "Repair/Replace/Recal Loop Component," Dated 09/24/2007

Miscellaneous

Operator Logs dated 07/13/2007

Limerick Generating Station On-Line Work Schedule, 09/14/2007-09/16/2007

Section 1R15: Operability

Issue Reports and Action Requests

IR 060981, "HPCI Turbine Steam Supply Valve Position Relay Contacts Failed"
IR 101384, "Inappropriate Conclusions in Disp PEP I0012531/CR 00060981"
IR 641784, "HPCI Aux Oil Pump Did Not Stop per PV&F"
IR 642617, "HV-055-2F006 Failed to Stroke Open"
IR 658690, "Unit 2 RCIC OOS/Gross Fail Alarm"
IR 658931, "RCIC Pump Suction HI Press Alarm Came in While Swapping Suction Valves"
IR 658950, "HPCI Oil Pressure Lower Than Desired Band"
A1626638, "HPCI Oil Pressure Lower Than Desired Band"
IR 651187, "HPCI Higher than Normal Unit 1 HPCI Pump Room Temperature"
IR 664065, "Unit 2 Recirculation Pump #2 Seal Pressure Drop"

Miscellaneous

Limerick Generating Station UFSAR Section 6.3

LEAM-0008, "HPCI Flow to RPV w/Single Discharge Path Open," Revision 0

M-48-12, "SLCS Boron Injection Delay Time," Revision 4

M-55-10, "HPCI Line Sizing Check," Revision 4

M-55-26, "ATWS 3A HPCI Flow Split Calculation to Size a Flow Orifice for Branch to Core Spray," Revision 6

ECR LG 01-01152, "HPCI Failed Injection Valve – Provide Quality Docs"

Section 1R19: Post Maintenance Testing

Procedures

ST-2-042-638-2, "ATWS - Reactor Vessel Water Level - Low Low, Functional Test," Revision 12

ST-6-051-231-2, "A RHR Pump, Valve and Flow Test," Revision 52

ST-6-012-231-0, "A Loop RHRSW Pump, Valve and Flow Test", Revision 54

ST-6-048-230-1, "SLC Pump, Valve and Flow Test", Revision 32

ST-6-107-201-0, "IST Valve Stroke for New Baseline," Revision 4

M-C-792-001, "Fairbanks Morse Opposed Piston Diesel Engine Examination and General Maintenance," Revision 4

Issue Reports and Action Requests

IR 338368, "Unit 2 RCIC Small Packing Leak from HV-049-2F008 OUTBD PCIV"

IR 381319, "Unit 2 RCIC HV-049-2F008 Packing Leak"

IR 654021, "D22 Diesel Lube Oil Circ Pump Making Excess Noise"
IR 654041, "Dual Indication for HV-51-2F024A During Stroke Close"
IR 663431, "D21: Brush Holder Cable Replacement Not Identical to Original"
IR 664060, "D21 Diesel Rapid Shutdown Due to Cylinder Leak"
IR 664291, "D21 Emergency Stop Alarm Failed to Annunciate"
IR 676024, "Indicating Lights did not Illuminate"
A1178453, "Disassemble and Inspection 20" Manual Check Valve, 012-0001C"
A1624433, "Replace RRCS HP/HP/POI Cards"
A1628140, "D21 Over Excitation During Break-In Run"
A1628023, "Alarms on D21 Still Annunciated and Will Not Clear"
A1628302, "D21 Diesel Rapid Shutdown Due to Cylinder Leak"
A1630245, "Unit 2 RCIC Steam Line Outboard PCIV"

Work Orders

R1005988, "D21 24 Month Diesel Inspection Per M-C-792-001"

Miscellaneous

Limerick Generating Station On-Line Work Schedule 08/23/2007-08/26/2007

Operator Logs dated 08/23/2007

Safety Relief Valve Technical Specification Accident Monitoring Instrumentation Table 3.3.7.5-1

Section 1R22: Surveillance Testing

Procedures

ST-2-051-802-2, "Division 2 LPCI System Response Time Testing," Revision 8

ST-2-055-810-1, "HPCI System Response Time Testing," Revision 11, completed 09/18/2007

ST-6-055-230-1, "HPCI Pump, Valve, and Flow Test," Revision 65, completed 09/18/2007

ST-6-092-314-2, "D24 Diesel Generator Slow Start Operability Test Run," Revision 61,
completed 07/16/07

ST-6-107-790-2, "Control Rod Scram Timing," Revision 11, completed 09/20/2007

Issue Reports and Action Requests

A1614302, "U2 HCU 46-47 Has No Full Out Position Indication on Full Core Display"

IR 671836, "Blue Scram Light Failed to Light During ST-6-107-790-2"

Section 1R23: Temporary Plant Modifications

Procedures

CC-AA-112, "Temporary Configuration Changes," Revision 12

S43.0.C, "Clearing an Electrical or Mechanical Stop," Revision 18

Miscellaneous

TRT-D7-164, "Install 1B Reactor Recirculation Pump Motor Generator Temporary
Mechanical Stop"

C0221920, "Install Temporary Mechanical High Speed Stop in XY-M1-1S001B"

Limerick Generating Station UFSAR Section 5.4

Limerick Generating Station Technical Specifications 3/4.4.1

Issue Reports and Action Requests

IR 631119, "1B Recirc Pump Speed Changes"

IR 654530, "Emergent PRA - Need New AR Created to Install Travel Limiter"

A1616738, "1B Recirc Pump Speed Changes"

A1625008, "Need New AR Created to Install Travel Limiter"

Section 1EP6: Drill Evaluation

Procedures

EOP T-117, "Level/Power Control," Revision 15
EOP T-104, "Radioactivity Release Control," Revision 12
EOP T-103, "Secondary Containment Control," Revision 17
EOP T-270, "Terminate and Prevent Injection Into RPV," Revision 12
EP-AA-122, "Drills and Exercises," Revision 7
EP-AA-122-F-01, "Drill and Exercise Evaluation Criteria," Revision B
EP-AA-122-1001, "Drill and Exercise Scheduling, Development, and Conduct," Revision 8
EP-AA-122-1002-F-02, "Drill and Exercise Objective Evaluation Data Tables," Revision B
LS-AA-120, "Issue Identification and Screening Process," Revision 7
T-103, "Secondary Containment Control," Revision 17

Miscellaneous

IR 437320
IR 670538
Limerick [EP] Training Drill Series Evaluation Report, dated 07-31-2007
LSES-8020, "Licensed Operator Training Simulator Evaluation Scenario," Revision 0
NRC IR 50-352&353/2005009

Section 4OA1: Performance Indicator (PI) Verification

Procedures

S92.6.N, "Diesel Oil Storage Tank Lineup to Fill Other than its Associated Day Tank,"
Revision 10

Issue Reports and Action Requests

IR 556902, "Minor Leakby of 049-2F014 Discovered During ST-2-049-601-2"
IR 565800, "HV-049-1F019 RCIC Min Flow Shows Dual Indication at 600 GPM"
IR 620861, "GP-18 Review HPCI/RCIC Oscillations"
IR 628573, "RCIC MOV Overload or Power Loss DS14"
IR 628579, "Inadvertent RCIC OOS Annunciator"
IR 628600, "2DA-09 Tripped on Thermals"
IR 642618, "Valve Stroke Time Outside Acceptable Range"
IR 652846, "RCIC Overspeed Test Potentiometers Possibly Not Locked"
A1238085, "Determine if HPCI is Operable With Temperature Instrumentation Installed"
A1295250, "FI-49-1R600-1 Spiking"
A1304397, "Revise the ML-008 Spec to Correctly Reflect the Safety Classification of the RCIC
Min Flow Line"

Miscellaneous

NEI 99-02, "Regulatory Assessment Performance Indicator Guideline," Revision 5
Reactor Oversight Program MSPI Bases Document, Limerick Generating Station, Revision 1
MSPI Derivation Reports for HPCI, RCIC, and EDGs
Operator Logs dated 07/01/2007 through 07/31/2007
Maintenance Rule Failure Reports for HPCI, RCIC, and EDGs
LG 01-00170, "Classification of the RCIC Min Flow Line"

Section 4OA2: Other

Issue Reports and Action Requests

A1610688 2C-P501 Packing Leakoff Excessive (Complete)
A1615940 2C Circ Pump Step Change in Vibration
A1620985 Spray Pond Level/Temp Alarming Before Setpoints Reached
A1621992 2C-P501 Excessive Packing Leakage (Complete)
A1622672 Control Rod 22-35 Temp at 305 Deg F
A1628676 Spray Pond Hi Temp Alarms Early
C0221274 2C-P501-DR Inspect or Replace Motor Bearings
IR 612083 2C-P501 Packing Leakoff Excessive
IR 612647 Drive Mechanism Temperature for HCU 30-35 is @429 Degrees F
IR 627595 2C Circ Pump Surge Capacitor Damaged
IR 628965 2C Circ Pump Step Change in Vibration
IR 639934 "Spray Pond Lo Level/Hi Temp" Alarm Locked In
IR 643596 Spray Pond Level/Temp Alarming Before Setpoints Reached
IR 645466 2C-P501 Excessive Packing Leakage
IR 648107 Control Rod 22-35 Temp at 305 Deg F (Completed)
IR 649388 Hairline Crack Identified on Yoke
IR 649806 2C-P501-DR Temp Cooling
IR 654068 Hairline Crack Identified on Yoke
IR 654070 Hairline Crack Identified on Yoke
IR 665262 Spray Pond Hi Temp Alarms Early
IR 672315 2C-P501 High Packing Leak Off

Other Documents

Plant Health Committee System Presentation: Circ Water, June, 2007
Plant Health Committee System Presentation: Control Rod Drive Supply, June, 2007
Plant Health Committee System Presentation: EDG, June, 2007
Plant Health Committee System Presentation: RHRSW, June, 2007
SHIP Chronic Problem Report: Circ Water, June, 2007
SHIP Chronic Problem Report: EDG, June, 2007
System Health Overview Report: Circ Water, June, 2007
System Health Overview Report: Control Rod Drive Supply, June, 2007
System Health Overview Report: EDG, June, 2007
System Health Overview Report: RHRSW, June, 2007
System Health Overview Report: Circ Water, Sept, 2007
System Health Overview Report: Control Rod Drive Supply, Sept, 2007
System Health Overview Report: EDG, Sept, 2007
System Health Overview Report: RHRSW, Sept, 2007

Section 4OA3: Event Followup

Procedures

OP-LG-109-101-1001, "Limerick System Specific Tagging Guides," Revision 15

Issue Reports and Action Requests

IR 601910, "Drainage System Clogged"
IR 602042, "Unit 2 SDV Vent/Drain Valves Open With Scram Signal Present"
IR 602921, "Division 1 and 4 MSIV Isolation Logic Alarms"

Miscellaneous

LER 2007-001, "Scram Discharge Volume Vent and Drain Valves Failed Open Due to Clearance Tagging Error"

LER 2007-002, "Valid Actuation of Main Condenser Low Vacuum Isolation Logic During Outage"

LER 2007-003, "Automatic Actuation Of The Reactor Protection System at Power"

LIST OF ACRONYMS

ADAMS	Agencywide Documents Access Management System
AR	action request
ASME	American Society of Mechanical Engineers
CAP	Corrective Action Program
CFR	Code of Federal Regulations
CRD	control rod drive
EDG	emergency diesel generator
EHC	electro-hydraulic control
EP	emergency preparedness
ERO	Emergency Response Organization
HPCI	high pressure coolant injection
IR	issue report
kV	kilo volt
LER	Licensee Event Report
LOCA	loss of coolant accident
MSIV	main steam isolation valve
NCV	non-cited violation
NEI	Nuclear Energy Institute
NRC	Nuclear Regulatory Commission
OA	other activities
PAR	protective action recommendation
PARS	Publicly Available Records
PI	performance indicator
P&ID	pipng and instrumentation drawing
PMT	post-maintenance test
RCIC	reactor core isolation cooling
RHR	residual heat removal
RRCS	redundant reactivity control system
SCBA	self-contained breathing apparatus
SDV	scram discharge volume
SHIP	system health indicator program
SSC	structure, system, component
TS	technical specification
UFSAR	updated final safety analysis report