January 10, 2002

Mr. Oliver D. Kingsley, President
Exelon Nuclear
Exelon Generating Company
200 Exelon Way, KSA 3-E
Kennett Square, PA 19348

SUBJECT: LIMERICK GENERATING STATION - NRC INSPECTION REPORT 50-352/01-12, 50-353/01-12

Dear Mr. Kingsley:

On December 29, 2001, the NRC completed an inspection at your Limerick Generating Station Units 1 and 2. The enclosed report documents the inspection findings which were discussed on January 4, 2002, with Mr. W. 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 procedures and records, observed activities, and interviewed personnel.

No findings of significance were identified.

Since September 11, 2001, the Limerick Generating Station has assumed a heightened level of security based on a series of threat advisories issued by the NRC. Although the NRC is not aware of any specific threat against nuclear facilities, the heightened level of security was recommended for all nuclear power plants and is being maintained due to the uncertainty about the possibility of additional terrorist attacks. The steps recommended by the NRC include increased patrols, augmented security forces and capabilities, additional security posts, heightened coordination with local law enforcement and military authorities, and limited access of personnel and vehicles to the site.

The NRC continues to interact with the Intelligence Community and to communicate information to Exelon Nuclear. In addition, the NRC has monitored maintenance and other activities which could relate to the site's security posture.

In accordance with 10 CFR 2.790 of the NRC's "Rules of Practice," a copy of this letter and its enclosure will be available electronically for public inspection in the NRC Public Document Room or from the Publicly Available Records (PARS) component of the NRC's document system (ADAMS). ADAMS is accessible from the NRC Web site at http://www.nrc.gov/reading-rm.html (The Public Electronic Reading Room).

Sincerely,

/RA/

Mohamed Shanbaky, Chief
Project Branch 4
Division of Reactor Projects

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

Enclosure: Inspection Report 50-352/01-12, 50-353/01-12

Attachment 1: Supplemental Information

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U.S. NUCLEAR REGULATORY COMMISSION

REGION 1

Docket Nos: 50-352; 50-353

License Nos: NPF-39, NPF-85

Report Nos: 50-352/01-12, 50-353/01-12

Licensee: Exelon Generation Company, LLC

Facility: Limerick Generating Station, Units 1 & 2

Location: Evergreen and Sanatoga Roads
Sanatoga, PA 19464

Dates: November 11, 2001 thru December 29, 2001

Inspectors: A. Burritt, Senior Resident Inspector
B. Welling, Resident Inspector
J. Jang, Senior Health Physicist
T. McMurtray, Senior Resident Inspector, Peach Bottom
D. Florek, Senior Project Engineer
T. Fish, Operations Engineer
C. Sisco, Operations Engineer

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

SUMMARY OF FINDINGS

IR 05000352-01-12, IR 05000353-01-12; on 11/11-12/29/2001; Exelon Generation Company; Limerick Generating Station, Units 1 and 2; Resident Inspector and Health Physicist Specialist Report.

This report was conducted by resident inspectors, regional operations engineers, a regional project engineer, and a regional health physics specialist. The inspection identified no findings of significance.

The significance of most findings is indicated by their color (Green, White, Yellow, Red) using Inspection Manual Chapter 0609, "Significance Determination Process" (SDP). Findings for which the SDP does not apply are indicated by "No Color" or by the severity level of the applicable violation. The NRC's program for overseeing the safe operation of commercial nuclear power reactors is described at its Reactor Oversight Process website at http://www.nrc.gov/reactors/operating/oversight.html

A. Inspector Identified Findings

None

B. Licensee Identified Violations

Violations of very low significance which were identified by Exelon have been reviewed by the inspector. Corrective actions taken or planned by Exelon appear reasonable. These violations are listed in section 40A7 of this report.

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Report Details

Summary of Plant Status

Unit 1 began this inspection period operating at 100% power and remained at or near that power level except for brief periods of planned testing and control rod pattern adjustments. On December 21, 2001, the unit began end-of-cycle coastdown. On December 26, operators removed the 6A feedwater heater from service, and restored power to 100%. Power level at the end of the period was approximately 100%.

Unit 2 began this inspection period operating at 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, Barrier Integrity

1R04 Equipment Alignment (71111.04)

a. Inspection Scope

The inspectors performed a partial walkdown on the D12, D13, and D14 emergency diesel generators, while the D11 emergency diesel generator was inoperable for a planned maintenance overhaul. The inspector used procedures S92.9.N, "Routine Inspection of the Diesel Generators," and S92.1.N, "Diesel Generator Setup for Automatic Operation Following Maintenance." The walkdown included reviews of valve positions, major system components, electrical power availability, and equipment deficiencies.

The inspectors performed a complete system walkdown of accessible portions of the residual heat removal service water system. The inspectors used piping and instrumentation diagram 8031-M-12. They reviewed valve positions, major system components, electrical power availability, and equipment deficiencies.

b. Findings

No findings of significance were identified.

1R05 Fire Protection (71111.05)

a. Inspection Scope

The inspectors toured high risk areas at both Limerick units to assess Exelon's control of transient combustible material and ignition sources, fire detection and suppression capabilities, fire barriers, and any related compensatory measures. The inspectors reviewed the respective Pre-Fire Action Plan procedures and Section 9A of the Updated Final Safety Analysis Report (UFSAR). The fire areas included:

- Unit 1 reactor building elevation 283' (fire area 47)
- Unit 1 'A' and 'C' RHR room elevation 201' (fire area 32)
- Unit 1 reactor core isolation cooling room (fire area 33)
- Unit 1 sump passage way room (fire area 39)

b. Findings

No findings of significance were identified.

1R06 Flood Protection Measures (71111.06)

a. Inspection Scope

The inspectors conducted a design review of flood protection measures, observed Limerick's flood protection equipment, and reviewed mitigation plans to verify that they were consistent with design requirements. The inspectors reviewed and/or observed the condition and adequacy of sump pumps, level alarm circuits, cables/splices qualified for submergence, and adequate drainage from manholes. The inspectors conducted a review of the Exelon's evaluation of the effects of water submergence on safety-related cables, splices and cable supports. The inspectors walked down the emergency core cooling compartments, emergency diesel generator rooms, and the spray pond pump structure. The inspectors reviewed:

- the adequacy of watertight doors;
- the sealing of equipment below postulated flood levels;
- the condition of sump pumps and room flooding alarms.

The inspectors also walked down the earth dikes for the following large, on-site tanks:

- Units 1 and 2 Condensate Storage Tanks
- Refueling Water Storage Tank
- Clarified Water Tank
- Demineralized Water Tank

The inspectors also verified that there were no unanalyzed sources of flooding, including holes and unsealed penetrations between flood areas and the common drain systems and sumps between flood areas. The inspectors reviewed several risk significant alarm response procedures related to compartment and general area flooding. The inspectors reviewed Limerick's corrective action system to verify that previous flooding issues and equipment problems had been identified, analyzed and resolved.

The following procedures were included in the review:

- Limerick Generating Station (LGS) Updated Final Safety Analysis Report (UFSAR) Section 2.4, "Hydrologic Engineering"
- LGS UFSAR Section 3.4, "Water Level (Flood) Design"
- LGS Severe Accident Risk Assessment
- Design Basis Document L-T-07, Revision 1, "External Hazards"
- SE-4, Revision 5, "Flood"

- SE-4-1, Revision 4, “Reactor Enclosure Flooding”
- SE-4-2, Revision 1, “Turbine/Control Enclosure Flooding”
- SE-4-3, Revision 2, “Flooding External to Power Block”

b. Findings

No findings of significance were identified.

1R11 Licensed Operator Requalification Program (71111.11)

a. Inspection Scope

The inspectors reviewed documentation of operating history since the last requalification program inspection. This period covered November 1999 through October 2001. The inspector reviewed NRC inspection reports, licensee event reports, licensee condition reports, and the NRC plant issues matrix to identify operational events that were indicative of possible training deficiencies.

The following inspection activities were performed using NUREG-1021, Rev. 8, “Operator Licensing Examination Standards for Power Reactors,” Inspection Procedure Attachment 71111.11, “Licensed Operator Requalification Program,” Appendix A, “Checklist for Evaluating Facility Testing Material,” and NRC Manual Chapter 0609, Appendix I, “Operator Requalification Human Performance Significance Determination Process (SDP),” as acceptance criteria.

The operating tests for the week of November 12, 2001, and a sample of the biennial written exams were reviewed for quality.

The inspectors observed the dynamic simulator exams and job performance measures being administered. These observations included facility evaluations of crew and individual performance on the dynamic simulator exam.

Simulator performance and fidelity were reviewed for conformance with the reference plant control room. The inspectors also reviewed simulator deficiency reports covering the period from November 1999 through October 2001.

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

An in-office review was conducted of Limerick requalification exam results for the complete 2001 annual/biennial testing cycle. The inspection assessed whether pass rates were consistent with the guidance of NRC Manual Chapter 0609, Appendix I, “Operator Requalification Human Performance Significance Determination Process.”

The inspector verified that:

- crew pass rate was greater than 80%
- individual pass rate on the dynamic simulator test was greater than or equal to

80%
- individual pass rate on the walk-through test was greater than or equal to 80%
- individual pass rate on the written test was greater than or equal to 80%
- overall pass rate among individuals for all portions of the exam was greater than or equal to 75%.

b. Findings

No findings of significance were identified.

1R12 Maintenance Rule Implementation (71111.12)

a. Inspection Scope

The inspectors reviewed Exelon's actions with respect to the Maintenance Rule for equipment performance problems associated with:

- water intrusion into D11 and D12 fuel oil storage tanks
- 2'K' automatic depressurization system valve air supply check valve leak
- D24 emergency diesel generator dual fuel plug gasket leaks
- D23 emergency diesel generator loose tappet assembly nuts

The inspectors reviewed associated maintenance action requests and condition reports including A1327103, A1314104, A1348170, and A1347180.

b. Findings

No findings of significance were identified.

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

a. Inspection Scope

The inspectors reviewed Exelon's risk management and risk assessments as required by 10 CFR 50.65 (a)(4) of the following emergent and planned maintenance activities. The inspectors reviewed the Sentinel on-line risk assessment results, risk management activities, work control center planning and scheduling, and emergent work-related activities.

- D11 emergency diesel generator overhaul activities
- 201 startup power source removed from service for transformer oil pump repairs

b. Findings

No findings of significance were identified.

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

a. Inspection Scope

The inspectors observed licensed operator performance in the control room during the removal of the Unit 1 6A feedwater heater from service during end of cycle coastdown. The inspector also reviewed and evaluated the operator's use of procedures S02.2.B, "Removal of the Steam Side of Fifth and Sixth Feedwater Heaters from Service during End of Cycle Coastdown," and GP-5, Appendix 2, Attachment 7, "Removing Feedwater Heaters from Service" while evaluating the evolution.

The inspectors reviewed personnel performance issues associated with LER 1-01-001, Emergency Diesel Generator Fuel Oil Water Removal Missed Surveillance Test. On July 11, Exelon identified that the D11 and D12 emergency diesel generator fuel oil storage tanks contained a significant quantity of water. The inspector verified that the issues associated with this event were properly included in Exelon's corrective action program. The inspector reviewed licensed operator performance prior to the water intrusion as well as human performance issues after the water intrusion.

In assessing operator performance, the inspector reviewed the following documents:

- NRC Event Notification 38132
- PEP I0012833 (later became CR-61233)
- Action Request A1327103, A1327106, A1327107, A1327108, A1327110, A1327111, A1327112, A1327114, A1327242
- Plant Operations Review Committee Meeting Minutes 89-14, 01-045, 01-046, 01-047
- P&ID 8031 M-382
- Limerick Significant Deficiency Report No.146
- Limerick Calculation LM 007
- Nuclear Operations Notification LI-01-007, Water Intrusion in Limerick Diesel Fuel Oil Storage Tanks
- Limerick Meteorological Data
- Contracted water removal invoice

a. Findings

No findings of significance were identified.

1R15 Operability Evaluations (71111.15)

a. Inspection Scope

The inspectors reviewed the technical adequacy of operability evaluations associated with the following plant equipment conditions:

- Non-conservative decay heat assumptions (A1333606)
- Emergency service water alternate supply to emergency diesel generator modification (A1328163)
- Emergency service water valve HV-011-1005A found out-of-position (A1346583, and CR 84724)

The inspectors reviewed the applicable action request and condition report documents and referred to Exelon procedure LS-AA-105, Operability Determinations.

b. Findings

No findings of significance were identified.

1R19 Post-Maintenance Testing (71111.19)

a. Inspection Scope

The inspectors observed post-maintenance testing and reviewed the test data for the following:

- High pressure coolant injection steam line drain flow orifice internals inspection and replacement
- 1C residual heat removal pump motor maintenance
- Replaced defective 1B reactor high pressure trip alarm relay

The inspectors reviewed the following documents:

- ST-2-042-646-1, ST-2-042-929-1, M1349414, A1349414

b. Findings

No findings of significance were identified.

1R22 Surveillance Testing (71111.22)

a. Inspection Scope

The inspectors observed and reviewed the results of several scheduled equipment surveillance tests, including:

- ST-2-042-636-2, Feedwater/main turbine trip system actuation - reactor vessel water level - high level

- ST-6-092-113-2, D23 Emergency Diesel Generator 24 hour Endurance Test
- ST-2-051-107-1, Division III (LPCI) LSF/SSA - non-outage

b. Findings

No findings of significance were identified.

4. OTHER ACTIVITIES [OA]

4OA1 Performance Indicator Verification (71151)

.1 Reactor Safety Indicators

a. Inspection Scope

The inspectors reviewed the accuracy and completeness of the supporting data for the following Limerick performance indicators. The information was compared against the criteria contained in Nuclear Energy Institute (NEI) 99-02, Regulatory Assessment Performance Indicator Guideline, Revision 1, to verify that all conditions that met the NEI criteria were recognized, identified, and reported as Performance Indicator data:

- Safety system functional failures (October 2000 - September 2001)
- Residual heat removal unavailability (October 2000 - September 2001)
- High pressure coolant injection unavailability (July 2000 - June 2001)
- Emergency diesel generator unavailability (October 2000 - September 2001)
- Reactor coolant system leakage (October 2000 - September 2001)
- Reactor coolant system specific activity (October 2000 - September 2001)

b. Findings

The inspector could not complete the determination of the accuracy of the high pressure coolant injection (HPCI) unavailability performance indicator because of Exelon's ongoing evaluation to address a degraded condition discussed in NRC Inspection Report 50-353/01-07 (URI 50-353/01-07-02). Exelon is evaluating whether a reduced flow capability in the HPCI system was still adequate for loss of coolant accident conditions. If Exelon's analysis determines that the reduced flow capability was not sufficient, then additional HPCI unavailability will be applied to the calculations of this performance indicator and will likely result in the performance indicator changing color. This item is considered an unresolved item pending completion of Exelon's analysis and review by the inspector. **(URI) 50-353/01-12-01**.

.2 Radiation Safety Indicators

a. Inspection Scope

The inspectors reviewed the accuracy and completeness of the supporting data for RETS/ODCM Radiological Effluent Occurrences (October 2000 - September 2001) Limerick performance indicators. The information was compared against the criteria contained in Nuclear Energy Institute (NEI) 99-02, Regulatory Assessment Performance Indicator Guideline, Revision 1, to verify that all conditions that met the NEI criteria were recognized, identified, and reported as Performance Indicator data:

The inspector reviewed the following documents.

- monthly projected dose assessment results due to radioactive liquid and gaseous effluent releases;
- quarterly projected dose assessment results due to radioactive liquid and gaseous effluent releases; and
- associated procedures.

As part of this effort, the inspector also performed an independent verification of the licensee's capability for properly calculating projected doses to the public resulting from discharges of radioactive liquids and gases to the environment. The inspector used the "NRC PC-DOSE computer code" and the projected doses to the public by the following release pathways were compared.

- radioactive liquid release pathway;
- noble gas release pathway; and
- radioactive particulate release pathway.

b. Findings

No findings of significance were identified.

4OA3 Event Follow-Up (71153)

.1 LER-1-01-001

Emergency diesel generator fuel oil water removal missed surveillance test. This issue was inspected in sections 1R12 and 1R14 of this inspection report and dispositioned as a licensee identified violation in section 4OA7 of this report. This LER is closed.

.2 LER 2-01-002-1

Actuation of the Reactor Protection System for Unit 2 reactor scram on Turbine Trip. This event was inspected in NRC Inspection Report 50-352;353/01-05, and Exelon documented it in the corrective action program as PEP I0012792. No new findings of significance were identified during the LER review. This LER is closed.

.3 LER-1-01-002

Unanalyzed Fire Safe Shutdown Condition. This issue was inspected in NRC Inspection Report 50-352;353/01-05, and the licensee documented it in the corrective action program as PEP I0012873. No new findings of significance were identified during the LER review. This LER is closed.

4OA6 Meetings, Including Exit

.1 Exit Meetings

The inspectors presented the inspection results to Mr. Levis and other members of station management on January 4, 2002.

The results of a radiological protection inspection were presented to members of Exelon management at the conclusion of the inspection on November 19, 2001.

The results of an operator requalification program inspection were presented to members of licensee management at the conclusion of the inspection on November 16, 2001.

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

4OA7 Licensee Identified Non-Compliance

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

NCV Tracking Number	Requirement Licensee Failed to Meet
NCV 50-352/01-12-02	Technical Specification 4.8.1.1.2.b.2 requires that water in the emergency diesel generator fuel oil storage tank be removed every 31 days. On July 11, 2001, the licensee identified water in the D11 and D12 fuel oil storage tanks. The subsequent investigation revealed that during previous surveillance testing, an accumulation of water in the fuel oil storage tanks was not identified and therefore not removed as required. This issue was entered in the licensee's corrective action process as condition report (CR) 61233.

ATTACHMENT 1 - SUPPLEMENTAL INFORMATION

a. Items Opened, Closed, and Discussed

Opened

URI 50-353/01-12-01	Evaluation of reduced high pressure coolant injection flow on the high pressure coolant injection unavailability performance indicator.

Opened and Closed

NCV 50-352/01-12-02	Missed Technical Specification Surveillance Requirement 4.8.1.1.2.b.2 for diesel generator fuel oil storage tanks.

Discussed

URI 50-353/01-07-02	Analysis of impact of agastat relay failure on high pressure coolant injection and anticipated transient without scram design flows

b. List of Acronyms

AR	action request
CFR	Code of Federal Regulations
CR	Condition Report
HPCI	high pressure coolant injection
LER	licensee event report
LGS	Limerick Generating Station
LPCI	low pressure coolant injection
NCV	non-cited violation
NEI	Nuclear Energy Institute
PEP	Performance Enhancement Program
RHR	residual heat removal
SDP	significance determination process
UFSAR	Updated Final Safety Analysis Report
URI	unresolved item