

August 17, 2001

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

SUBJECT: LIMERICK GENERATING STATION - NRC INSPECTION REPORT  
50-352/01-09, 50-353/01-09

Dear Mr. Kingsley:

On August 11, 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 August 17, with Mr. R. Braun 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.

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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 50-352/01-09, 50-353/01-09

Attachments: (1) Supplemental Information

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J. Cotton, Senior Vice President - Operations Support  
J. Skolds, Chief Operating Officer  
G. Hunger, Chairman, Nuclear Review Board  
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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: 50-352/01-09, 50-353/01-09

Licensee: Exelon Generation Company, LLC

Facility: Limerick Generating Station, Units 1 & 2

Location: Evergreen and Sanatoga Roads  
Sanatoga, PA 19464

Dates: July 1, 2001 thru August 11, 2001

Inspectors: A. Burritt, Senior Resident Inspector  
B. Welling, Resident Inspector  
D. Florek, Senior Project Engineer  
S. Barr, Reactor Inspector  
K. Jenison, Senior Project Engineer  
S. Chaudhary, Senior Reactor Inspector  
W. Schmidt, Senior Reactor Inspector

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

## SUMMARY OF FINDINGS

IR 05000352-01-09, IR 05000353-01-09; on 07/01-08/11/2001; Exelon Generation Company; Limerick Generating Station; Units 1 and 2; Resident Inspector Report.

This inspection was conducted by resident inspectors and regional inspectors. 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/NRR/OVERSIGHT/index.html>.

## TABLE OF CONTENTS

|  |    |
|--|----|
| SUMMARY OF FINDINGS .....  | ii |
| Report Details .....   | 1  |
| 1. REACTOR SAFETY [R] .....  | 1  |
| 1R02 Changes to License Conditions .....                             | 1  |
| 1R04 Equipment Alignment .....                                       | 1  |
| 1R05 Fire Protection .....   | 2  |
| 1R12 Maintenance Rule Implementation .....                           | 2  |
| 1R13 Maintenance Risk Assessments and Emergent Work Evaluation ..... | 3  |
| 1R15 Operability Evaluations .....                                   | 3  |
| 1R17 Permanent Plant Modifications .....                             | 4  |
| 1R19 Post-Maintenance Testing .....                                  | 4  |
| 1R22 Surveillance Testing .....                                      | 5  |
| 4. OTHER ACTIVITIES [OA] .....                                       | 5  |
| 4OA1 Performance Indicator Verification .....                        | 5  |
| 4OA2 Identification and Resolution of Problems .....                 | 5  |
| 4OA6 Meetings, Including Exit .....                                  | 6  |
| SUPPLEMENTAL INFORMATION .....                                       | 7  |

## 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.

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**

#### 1R02 Changes to License Conditions (71111.02)

##### a. Inspection Scope

The inspectors reviewed a sample of safety evaluations (SEs) performed by the Limerick staff to verify that changes at the Limerick Generating Station related to systems, structures, or components (SSCs) and procedures, as described in the Updated Final Safety Analysis Report (UFSAR), were reviewed and documented in accordance with 10 CFR 50.59. The SEs were selected from the changes performed during the last year, taking into consideration the risk significance of the change, and the impact on the three reactor safety cornerstones. The inspectors also reviewed a sample of the safety reviews (SRs) or 50.59 screens associated with changes to SSCs and procedures for which the plant staff determined that a SE was not required. The review was performed to verify that the threshold for performing SEs was consistent with 10 CFR 50.59. The inspectors' review included those documents indicated in Section 1 of Attachment 2 of this report. Portions of other SEs and SRs were evaluated to determine the effectiveness of the problem identification and resolution process in the 50.59 area.

##### b. Findings

No findings of significance were identified.

#### 1R04 Equipment Alignment (71111.04)

##### a. Inspection Scope

The inspectors performed a partial walkdown of the D13 and D14 emergency diesel generators (EDGs) and associated electrical distribution system while the D11 and D12 EDGs were inoperable due to water intrusion into fuel oil storage tanks. The inspectors reviewed valve positions, major system components, electrical power availability, and equipment deficiencies.

The inspectors performed a complete system walkdown of the Unit 2 high pressure coolant injection (HPCI) system. The inspectors reviewed valve positions, electrical power availability, major equipment components, outstanding maintenance work requests, and equipment deficiencies.

### Documents Reviewed

- Piping and instrumentation diagrams 8031-M-055, 8031-M-056
- System check-off list 2S55.1.A (COL)
- HPCI pump, valve and flow surveillance test ST-6-055-230-2
- Updated Final Safety Analysis Report (UFSAR) Section 6.3
- HPCI Design Basis Document L-S-03
- Action Requests A1326146, A1329093, A1324684
- Scaffolding Procedure M-C-700-335
- PEP I0012920, "Scaffold Not Installed Properly"

#### 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 UFSAR. The fire areas reviewed included:

- 1C battery room (fire area 4)
- 1B core spray pump room (fire area 38)
- 1A/1C residual heat removal room (fire area 32)

#### 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 the following equipment performance issues.

The inspectors reviewed Exelon's actions with respect to the Maintenance Rule for an equipment performance problem associated with the emergency core cooling and reactor core isolation cooling systems instrument power inverter failures due to a DC system ground during battery maintenance. The inspectors reviewed associated maintenance action requests (AR) and corrective action documents (PEPs) including AR A1324281 and PEP I0012756.

#### 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 and D12 emergency diesel generator water intrusion into fuel oil storage tanks
- C emergency service water out of service with bus undervoltage testing affecting B emergency service water

Documents Reviewed

- Condition Report PEP I0012894 - LGS risk assessments of on-line maintenance work less than adequate
- Routine Test RT-2-092-322-1 - D12 4.16 kV emergency bus undervoltage
- Action Requests A1318472 and A0914652

b. 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. As needed, the inspectors discussed the operability evaluations with operators and engineering personnel.

- Emergency diesel generator cylinder liner O-rings - wrong material/shortened service life (AR A1324927)
- 2A residual heat removal system heat exchanger bypass leakage (AR A1313075)
- Unit 1 high pressure coolant injection system increased lube oil priming time (AR A1330521)

The inspectors reviewed the applicable action request documents and referred to Exelon Nuclear Operations Manual Chapter 11.1, Operability.

b. Findings

No findings of significance were identified.

1R17 Permanent Plant Modifications ( 71111.17)

a. Inspection Scope

The inspectors reviewed permanent plant modifications selected from approved engineering change requests (ECR) that had been completed or prepared for installation within the last year to verify the modification did not degrade any SSC or place the plant in an unsafe condition. The selection was based on risk significance, impact on the reactor safety cornerstones, and a representative sample of engineering disciplines and plant activities. The review included design (analyses, calculations and technical evaluations), as-installed implementation, and post-modification testing of the changes, and completeness of the documentation. As needed, discussions were held with the responsible design and system engineers, and other personnel familiar with the changes. The inspectors' review covered the modifications indicated in Sections 2 and 3 of Attachment 2 to this report, which included permanent plant changes, design changes, set point changes, procedure changes, equivalency evaluations, calculations, and commercial grade dedications. Portions of other modifications were evaluated while picking the specific sample for review and as input to determine the effectiveness of the problem identification and resolution process in the plant modification area.

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 D12 emergency diesel generator maintenance overhaul.

The inspectors referred to testing procedures and work order documents, including RT-6-092-312-1, "D12 Diesel Generator Run-In".

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:

- RT-2-092-311-1, D12 4.16 Kv emergency bus undervoltage relay 127-116 diagnostic test
- ST-6-092-111-2, D21 diesel generator 24-hour endurance test
- ST-6-092-313-2, D23 slow start operability test run
- ST-6-092-311-1, D11 slow start operability test run

##### b. Findings

No findings of significance were identified.

#### 4. **OTHER ACTIVITIES [OA]**

#### 4OA1 Performance Indicator Verification (71151)

##### a. Inspection Scope

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

- RCIC unavailability (April 2000 through June 2001)

##### b. Findings

No findings of significance were identified.

#### 4OA2 Identification and Resolution of Problems (71111.02 and 71111.17)

##### a. Inspection Scope

The inspectors reviewed the Limerick problem identification and resolution program related to selected plant modifications and safety evaluations. The review was conducted to verify that the licensee identified issues at the proper threshold and entered them in the corrective action program. The inspectors also evaluated the adequacy of the resultant corrective actions. Corrective action documents (PEPs) related to the 50.59 process and to design changes were reviewed to assess the scope of identified problems. Additionally the Quality Assurance audits and surveillance reports for these topics were sampled. The manager of Corrective Actions was interviewed to determine the level at which PEPs were initiated and how PEPs were prioritized for action and cause analysis. Items reviewed for this area are listed in Sections 4 and 5 of Attachment 2 to the inspection report.

b. Findings

No findings of significance were identified.

4OA6 Meetings, Including Exit

.1 Exit Meetings

The resident inspectors presented the inspection results to Mr. Braun and other members of station management on August 17, 2001. Regional inspectors presented the results of the Permanent Plant Modifications and Changes to License Conditions inspections to members of station management on July 20, 2001.

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

Attachment 1

**SUPPLEMENTAL INFORMATION****a. Key Points of Contact**Exelon Generation Company

|              |                                     |
|--------------|-------------------------------------|
| J. Armstrong | Director - Site Engineering         |
| R. Braun     | Plant Manager                       |
| E. Callan    | Director - Maintenance              |
| J. Kraus     | Senior Manager - Design Engineering |
| W. Levis     | Site Vice President                 |
| W. O'Malley  | Senior Manager - Operations         |
| J. Tucker    | Senior Manager - Plant Engineering  |

**b. List of Documents Reviewed**

1. Engineering Change Request (ECR) Safety Evaluations that received a detailed NRC review during the July 16 -20, 2001 Modifications Inspection

| <u>ECR</u> | <u>Title</u>   |
|------------|--|
| 2000-00684 | Qualification of Piping Hangers Affected by the Operator Motor Replacement                           |
| 2000-00446 | High Pressure Coolant Injection (HPCI) Flow Curve Corrections  |
| 2000-00419 | Remove Erroneous Statement from Updated Final Safety Analysis Report (UFSAR) Concerning Pump Seizure |
| 2000-00375 | Standby Liquid Control UFSAR Change  |
| 2000-00262 | Essential Service Water (ESW) Pump Flow Curve Corrections  |
| 2000-00227 | Control of Computer Application Software   |
| 1999-02821 | Organizational Changes   |
| 1999-02757 | Station Batteries  |
| 1999-02514 | Reload 3, Cycle 4  |
| 1999-02197 | Purchase of Used Control Rods  |
| 1999-01819 | Posting of Class II Software 3d Monicore   |
| 1999-01413 | ESW Valve Replacement  |
| 1998-02502 | Changing Safety Relief Valve (SRV) Tolerance Setpoints.  |
| 1998-02385 | UFSAR Section 8.1 Review Discrepancies   |
| 1998-02206 | Seismic Qualifications of 4kv Switchgear Doors   |
| 1998-01139 | Steam/Fire Boundaries Associated with Stream Flooding Isolation Dampers                              |
| 1998-02502 | Technical Specification (TS) Change Increasing SRV Tolerance   |

2. Engineering Change Request (ECR) Modifications that received a detailed NRC review during the July 16 -20, 2001 Modifications Inspection

| <u>ECR</u>  | <u>Title</u>  |
|-------------|---|
| 2000-01432  | Reactor Water Cleanup High Energy Line Break Replacements |
| 2000-01177  | Load Change Calculations                                  |
| 2000-00580  | HPCI Rotor Governor Side Shaft Damage                     |
| 2000-00546  | Unit 1 Spent Fuel Pool Re-rack                            |
| 2000-00329  | TS Figure 3.4.6.1-1 Revision Unit 1                       |
| 2000-00328  | TS Figure 3.4.6.1-1 Revision Unit 2                       |
| 1999-02576  | HPCI Alignment to Suppression Pool                        |
| 1999-02468  | Unit 1 RCIC Outboard Valve Improvement                    |
| 2000-00367  | Unit 2 RCIC Outboard Valve Improvement                    |
| 1999-02396  | Replace ESW piping for RHR motor oil coolers              |
| 1999-02201/ |   |
| 1999-01359  | HPCI Steam discharge level gauge and bypass orifices      |
| 1999-01416  | Replace Emergency Diesel Generator (EDG) supply valves    |
| 1999-00324  | Design Basis of Motor Generator MG set.                   |
| 1998-02820  | ESW EDG Supply Valve Replacement                          |
| 1995-03581  | Radwaste Hydrogen Analyzer Replacement                    |
| 1996-03593  | Enhancement to Secondary Containment UFSAR 6.2.3          |

3. Engineering Change Request (ECR) Modifications that received a summary NRC review during the July 16 -20, 2001 Modifications Inspection review

| <u>ECR</u>  | <u>Title</u>                                     |
|-------------|--|
| 2000-00472  | Preventive Maintenance Program Changes           |
| 2000-00046  | Walworth Valve Modifications                     |
| 1999-02848  | EDG Relay Upgrade                                |
| 1999-02787  | Iso-phase Bus Damper Bushing Material Change     |
| 1999-02113  | Check Valve Replacement                          |
| 1999-01419  | ESW Supply Valve Calculations                    |
| 1999-002537 | Lost Part Analysis Documentation                 |
| 1999-00074  | Setpoint Changes on Circuit Breaker              |
| 1999-00074  | Setpoint Changes 124-d42                         |
| 1998-00989  | Data Base Does Not Match E-1425                  |
| 1996-03593  | Enhancement to Secondary Containment UFSAR 6.2.3 |

4. Limerick Self-Assessments that were reviewed during the July 16 -20, 2001 NRC Modifications Inspection

Title

1<sup>st</sup> Period 2000 Modifications

Assessment of ECR 98-02820, dated 4/6/01

Assessment of PEP I0012467 Corrective Actions, dated 6/6/2001

Assessment of ECR 2000-00788 - ESW Valve Replacement

5. Limerick Performance Enhancement Program (PEP) corrective action documents that were reviewed during the July 16 -20, 2001 NRC Modifications Inspection.

| <u>PEP#</u> | <u>Title</u>   |
|-------------|--|
| I0012698    | NSRB Concerns about 50.59 Evaluation Adequacy - ESW supply valve |
| I0012467    | ESW Supply Valve 50.59 Review Bases Inconsistent with Design     |
| I0010488    | CST Tank Cleaning  |
| I0012836    | TPA 50.59 Screening Problem                                      |
| I0010678    | 50.59 Determination and UFSAR review                             |

c. **List of Acronyms Used**

|       |                                      |
|-------|--------------------------------------|
| AR    | action request                       |
| COL   | check-off list                       |
| ECR   | engineering change request           |
| EDG   | emergency diesel generator           |
| HPCI  | high pressure coolant injection      |
| Kv    | kilo volt                            |
| PEP   | Performance Enhancement Program      |
| RCIC  | reactor core isolation cooling       |
| SDP   | Significance Determination Process   |
| SE    | safety evaluation                    |
| SSC   | systems, structures, or components   |
| SR    | safety review                        |
| UFSAR | Updated Final Safety Analysis Report |