

November 22, 2004

Mr. Christopher M. Crane  
President and CNO  
Exelon Nuclear  
Exelon Generation Company, LLC  
200 Exelon Way KSA 3-E  
Kennett Square, PA 19348

SUBJECT: LIMERICK GENERATING STATION - NRC TRIENNIAL FIRE PROTECTION  
INSPECTION REPORT 05000352/2004008, 05000353/2004008

Dear Mr. Crane:

On October 21, 2004, NRC completed a triennial fire protection team inspection at Limerick Generating Station, Units 1 and 2. The enclosed report documents the inspection findings which were discussed at an exit meeting on October 21, 2004, with Mr. R. Degregorio and other members of the Exelon Nuclear staff.

This inspection examined activities conducted under your license as they relate to safety and compliance with the Commission's regulations and with the conditions of your license. The purpose of the inspection was to evaluate your post-fire safe shutdown capability and fire protection program. 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 2.790 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 NRC's document system (ADAMS). ADAMS is accessible from the NRC Web site at <http://www.nrc.gov/reading-rm/ADAMS.html> (the Public Electronic Reading Room).

Sincerely,

*/RA/*

John F. Rogge, Chief  
Electrical and Fire Protection Branch  
Division of Reactor Safety

Docket No. 50-352, 50-353  
License No. NPF-39, NPF-85

Enclosure: NRC Inspection Report 05000352/2004008, 05000353/2004008

cc w/encl:

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Site Vice President - Limerick Generating Station

Plant Manager, Limerick Generating Station

Regulatory Assurance Manager - Limerick

Senior Vice President - Nuclear Services

Vice President - Mid-Atlantic Operations

Vice President - Operations Support

Vice President - Licensing and Regulatory Affairs

Director - Licensing and Regulatory Affairs, Exelon Generation Company, LLC

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Mr. Christopher M. Crane

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**SISP Review Complete: John F. Rogge**

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U.S. NUCLEAR REGULATORY COMMISSION

REGION I

Docket No: 50-352, 50-353

License No: NPF-39, NPF-85

Report No: 05000352/2004008, 05000353/2004008

Licensee: Exelon Nuclear

Facility: Limerick Generating Station, Units 1 and 2

Location: P. O. Box 2300  
Sanatoga, Pennsylvania 19464

Dates: October 4 - 21, 2004

Inspectors: L. Scholl, Senior Reactor Inspector, DRS (Team Leader)  
R. Fuhrmeister, Senior Reactor Inspector, DRS  
R. Bhatia, Reactor Inspector, DRS  
C. Hott, Reactor Inspector, DRS

Approved By: John F. Rogge, Chief  
Electrical and Fire Protection Branch  
Division of Reactor Safety

## SUMMARY OF FINDINGS

IR 05000352/2004-008, IR 05000353/2004-008; 10/04/2004-10/21/2004; Limerick Generating Station, Units 1 & 2; Triennial Fire Protection.

The report covered a two week triennial fire protection team inspection by specialist inspectors. 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 Findings

No findings of significance were identified.

B. Licensee-Identified Violations

None

## Report Details

### Background

This report presents the results of a triennial fire protection team inspection conducted in accordance with NRC Inspection Procedure (IP) 71111.05, "Fire Protection." The objective of the inspection was to assess whether Exelon Nuclear has implemented an adequate fire protection program and that post-fire safe shutdown capabilities have been established and are being properly maintained. The following fire areas were selected for detailed review based on risk insights from the Limerick Individual Plant Evaluation for External Events:

- @ Main Control Room - Fire Area 24
- @ 2A Emergency Diesel Generator Room - Fire Area 83
- @ 2D Emergency Switchgear Room - Fire Area 16
- @ Unit 1 Reactor Building 253 Ft. Elevation - Fire Area 45

This inspection was a reduced scope inspection in accordance with the March 6, 2003, revision to IP 71111.05, "Fire Protection." Issues regarding equipment malfunction due to fire-induced failures of associated circuits were not inspected. Criteria for review of fire-induced circuit failures are currently the subject of a voluntary industry initiative. The definition of associated circuits of concern used was that contained in the March 22, 1982, memorandum from Mattson to Eisenhut, which clarified the requests for information made in NRC Generic Letter 81-12.

### **1. REACTOR SAFETY**

#### **Cornerstones: Initiating Events, Mitigating Systems**

#### 1R05 Fire Protection (71111.05)

##### .1 Fire Area Boundaries and Barriers

###### a. Inspection Scope

The team walked down accessible portions of the selected fire areas to observe material condition and the adequacy of design of fire area boundaries, fire doors, and fire dampers to ensure that Exelon was maintaining the passive features in a state of readiness. The team randomly selected three fire barrier penetration seals for detailed inspection to verify proper installation and qualification. The team reviewed associated design drawings, test reports, and engineering analyses. The team compared the observed in-situ seal configurations to the design drawings and tested configurations. Additionally, the team compared the penetration seal ratings with the ratings of the barriers in which they were installed. This was accomplished to verify that Exelon had installed the selected penetration seals in accordance with their design and licensing bases. The team also reviewed the licensee submittals and NRC safety evaluation reports (SERs) associated with fire protection features at Limerick Units 1 and 2.

###### b. Findings

No findings of significance were identified.

## .2 Post-Fire Safe Shutdown Lighting and Communications

### a. Inspection Scope

The team observed the placement and coverage area of eight-hour emergency lights throughout the selected fire areas to evaluate their adequacy for illuminating access and egress pathways and any equipment requiring local operation for post-fire safe shutdown. The team also reviewed preventive maintenance procedures and various documents, including the vendor manual and surveillance tests, to determine if adequate surveillance testing and periodic battery replacements were in place to ensure reliable operation of the emergency lights.

The team reviewed radio repeater location, power sources and preventive maintenance procedures to ensure fire department and operator communications could be maintained for fire fighting and post-fire safe shutdown conditions.

### b. Findings

No findings of significance were identified.

## .3 Programmatic Controls

### a. Inspection Scope

During tours of the facility, the team observed the material condition of fire protection systems and equipment, the storage of permanent and transient combustible materials, and control of ignition sources. The team also reviewed the procedures that controlled hot-work activities and combustibles at the site. These reviews were accomplished to ensure that Exelon was maintaining the fire protection systems, controlling hot-work activities, and controlling combustible materials in accordance with the UFSAR, administrative procedures and other fire protection program procedures.

### b. Findings

No findings of significance were identified.

## .4 Fire Detection Systems and Equipment

### a. Inspection Scope

The team reviewed the adequacy of the fire detection systems in the selected plant fire areas. This included a walkdown of the systems and review of the type of installed detectors as shown per location drawings. The team also reviewed licensee submittals and the NRC SERs associated with the selected fire areas. These reviews were performed to ensure that the fire detection systems for the selected fire areas were installed in accordance with the design and licensing bases of the plant. Additionally, the team reviewed fire detection surveillance procedures to determine the adequacy of the fire detection component testing and to ensure that the detection system would function as required.

b. Findings

No findings of significance were identified.

.5 Fixed Fire Suppression Systems

a. Inspection Scope

The team evaluated the adequacy of the sprinkler systems in fire areas 45E, 45W and 83, and the water-curtain system separating areas 45E and 45W by performing system walkdowns, review of system design, and reviews periodic system testing. This review was performed to verify that the fixed suppression systems met their design and licensing bases, and were being appropriately tested and maintained.

b. Findings

No findings of significance were identified.

.6 Manual Fire Suppression Capability

a. Inspection Scope

The team walked down selected standpipe systems and observed portable extinguishers to determine the material condition of the manual fire fighting equipment and verify locations as specified in the pre-fire plans and fire protection program documents. The team reviewed electric and diesel fire pump flow and pressure tests to ensure that the pumps were meeting their design requirements. The team also reviewed the fire main loop flow tests to ensure that the flow distribution circuits were able to meet the design requirements. The team inspected the fire brigade's protective ensembles, self-contained breathing apparatus (SCBA), and various fire brigade equipment to determine operational readiness for fire fighting.

The team reviewed pre-fire plans and smoke removal plans for the selected fire areas to determine if appropriate information was provided to fire brigade members and plant operators to identify safe shutdown equipment and instrumentation, and to facilitate suppression of a fire that could impact safe shutdown.

The team performed in-plant walkdowns to evaluate the physical configuration of electrical raceway and safe shutdown components in the selected fire areas to determine whether water from an inadvertent fire suppression system pipe rupture or from manual fire suppression activities in the selected areas could cause damage that could inhibit the ability to safely shut down the plant.

The team reviewed fire brigade initial training and continuing training course materials to verify appropriate training was being conducted for the station firefighting personnel. Additionally, the team reviewed selected fire drills and critiques to ensure that drills were being conducted in risk significant areas. The team reviewed the qualifications of several fire brigade leaders and members to ensure that they had met and maintained the requirements to be fire brigade leaders and members. The team also observed



portions of the fire brigade training conducted at the Exelon Fire Academy in West Conshohocken, PA.

b. Findings

No findings of significance were identified.

.7 Safe Shutdown Capability

a. Inspection Scope

The team reviewed the fire response procedures, alarm response procedures and operating procedures for the selected fire areas to evaluate the methods and equipment used to achieve safe shutdown following a fire. The team also reviewed piping and instrumentation diagrams for post-fire safe shutdown systems to identify required components for establishing flow paths, to identify equipment required to isolate flow diversion paths, and to verify appropriate components were properly evaluated and included in the safe shutdown equipment analysis. The team also reviewed selected remote shutdown components and their control circuits to ensure that proper isolation was provided for remote shutdown capability, in the event of a fire affecting the control room. The team performed field walkdowns to evaluate the protection of the equipment from the effects of fires.

Post-fire shutdown procedures for the selected areas were also reviewed to determine if appropriate information was provided to plant operators to identify protected equipment and instrumentation and if recovery actions specified in post-fire shutdown procedures considered manpower needs for performing required actions. The team also reviewed training lesson plans for the alternative shutdown procedures, discussed training with licensed operators, reviewed selected remote shutdown equipment tests, reviewed the adequacy of shift manning, and evaluated the accessibility of the alternative shutdown operating stations and required manual action locations.

Specific procedures reviewed for alternate safe shutdown from outside the control room included the following:

SE-1, Rev. 51, Remote Shutdown Procedure  
SE-1-2, Rev. 7, Protected Power Source  
2FSSG-3016, Rev. 0, Fire Area 016 Fire Guide  
1FSSG-3045E, Rev. 3, Fire Area 045E Fire Guide  
1FSSG-3045W, Rev. 0, Fire Area 045W Fire Guide  
2FSSG-3083, Rev. 0, Fire Area 083 Fire Guide

The team performed a walkdown of selected actions within these procedures with a plant operator. The team focused on the adequacy of actions necessary to achieve stable hot shutdown conditions. In particular, the ability to promptly complete time critical actions were assessed.

b. Findings

No findings of significance were identified.

.8 Safe Shutdown Circuits

a. Inspection Scope

The team reviewed power and control cable routing for a sample of components required for post-fire safe shutdown to determine if the cables were properly evaluated as part of the safe shutdown analyses.

The team reviewed electrical fuse and circuit breaker coordination studies to ensure equipment needed to conduct post-fire safe shutdown activities would not be impacted due to a lack of coordination. The team also reviewed the electrical isolation capability of selected equipment needed for post-fire safe shutdown to ensure that such equipment could be operated locally, if needed.

Due to the issuance of Change Notice 00-020 to Inspection Procedure 71111.05, "Fire Protection," the team did not review associated circuit issues during this inspection. This change notice has suspended this review pending completion of an industry initiative in this area.

b. Findings

No findings of significance were identified.

**4. OTHER ACTIVITIES**

4OA2 Identification and Resolution of Problems

.1 Corrective Actions for Fire Protection Deficiencies

a. Inspection Scope

The team reviewed the fire impairments log, open corrective maintenance work orders for fire protection and safe shutdown equipment, selected corrective action reports for fire protection and safe shutdown issues to evaluate the prioritization for resolving fire protection related deficiencies and the effectiveness of corrective actions. The team also reviewed recent Quality Assurance Audits, and Engineering Self-Assessments of the fire protection program to determine if the licensee was identifying program deficiencies and implementing appropriate corrective actions.

b. Findings

No findings of significance were identified.

4OA6 Meetings, including Exit

The team presented their preliminary inspection results to Mr. R. Degregorio and other members of the Exelon Nuclear staff on October 21, 2004. No proprietary information was included in this inspection report.

**ATTACHMENT**

**SUPPLEMENTAL INFORMATION**

**KEY POINTS OF CONTACT**

Licensee Personnel

C. Mudrick, Director of Operations  
E. Kelly, Manager of Engineering Programs  
D. Spamer, Senior Engineer  
R. Harding, Regulatory Assurance Engineer  
C. Bruce, Fire Protection Engineer, Limerick  
C. Pragman, Fire Protection Engineer, Kennet Square  
F. Burzynski, Fire Marshall, Limerick  
T. Flannigan, Exelon Fire Academy Manager  
J. Conway, Exelon Fire Academy Instructor  
K. Thomas, Exelon Fire Academy Instructor  
M. Hackney, Exelon Fire Academy Instructor  
B. Focht, Exelon Fire Academy Instructor  
J. George, System Manger  
S. Breeding, Operations Support

NRC

S. Hansell, Senior Resident inspector  
C. Colantini, Resident Inspector

**ITEMS OPENED, CLOSED, AND DISCUSSED**

Opened/Closed

None

**LIST OF DOCUMENTS REVIEWED**

Engineering Evaluations/Calculations/Modifications

Spec NE-294 Rev. 2, Post-Fire Safe Shutdown Program Requirements  
6900E-02, Rev. 8, Safeguard Auxiliary System-Phase Overcurrent Relay Selection and Co-ordination  
6900E-04, Rev. 2, Safeguard Auxiliary System-Ground Overcurrent Relays Selection and Co-ordination  
6900E-09, Rev. 7, Diesel Generator Protective Relay Settings  
6900E-11, Load Center Circuit Breakers Overcurrent Trip Devices  
LF-0007, Combustible Loading Analysis, Limerick Generating Station Units 1 and 2

LF-0011, Rev. 0, Hose Station Hydraulic Analysis  
 LF-0016-016, Rev. 0, Fire Area 016 Fire Safe Shutdown Analysis  
 LF-0016-024, Rev. 0, Fire Area 024 Fire Safe Shutdown Analysis  
 LF-0016-045E, Rev. 0, Fire Area 045E Safe Shutdown Analysis  
 LF-0016-045W, Rev. 0, Fire Area 045W Safe Shutdown Analysis  
 LF-0016-083, Rev. 0, Fire Area 083 Fire Safe Shutdown Analysis  
 Hydraulic Calculations Limerick Generating Station Unit #2 Diesel Generator Enclosure 217',  
 System PR52  
 Hydraulic Calculations Limerick Generating Station Philadelphia Electric Company, Pottstown,  
 Pa., PR61 FP45  
 Hydraulic Calculations Limerick Generating Station Unit #1 Reactor Drywell Penetration Area  
 Elev. 253' System #WP6  
 Hydraulic Calculations Limerick Generating Station Unit #1, Reactor Bldg, EI 253'-0 Hatchway  
 Protection System # DL73, Item #61  
 Hydraulic Calculations Limerick Generating Station Unit #1, Reactor Bldg, EI 253'-0 Water  
 Curtain System DL70, Item# 59, Drawing No. FP 38  
 LG-97-00855, Hose Reels Missing Flow Orifices  
 LG-02-00517, Rev. 0, Selected Emergency Lighting Unit Downgrade  
 LEAF-0010, Rev. 0, Fire Areas 12-19, 4 kV Switchgear Rooms, Bus Duct Penetrations  
 LEAF-0086, Rev. 0, Walkdown Paths for FSSD Manual Actions/Repairs  
 ECR-LG 00-00788, ESW EDG Valve Modification  
 ECR 98-01743, Rev. 0, Att. 1 LGS UFSAR  
 ECR 01-01233, SIL 636 Resolution for LGS  
 LM-0623, Hydraulic ESW Post Fire Calculation  
 LE-0099, Rev. 3, RSP Contact Resistance Calculation  
 GE-080-VC-00028, Rev.0,Original Fire SSA  
 N-00E-177-00002, Rev. 0, Power Rerate BOP  
 GE-NE-L12-00884, Rev. 0, GE-14 Fuel Analysis  
 G-080-VC-00026, Rev. 0, Delta Thermolag  
 GE-NE-0000-0003-3779, Rev. 1, SIL 636 LGS  
 L-T-10, Rev. 10, Fire Safe Shutdown

Condition Reports/Action Requests

00136779	00132131	00112688	00082116	00127668	00183857
01031688	01119850	00253967	00258121	00265131	00225258
00225726	00265287	01197191	00264915	00260196	00257742
00155783	00189006	00146156	00248683	00254040	00259001
00258968	00265872	00060370	00265634	00265411	00265418
00265124	00232717	00250540	00264620	00260417	00260302

Procedures

M-200-002, Rev. 6, 2.3 kV and 4 kV Power Circuit Breaker Overhaul  
 M-200-011, Rev. 3, 13.2 kV and 2.3 kV Switchgear Maintenance  
 M-200-012, Rev. 7, 13.2 kV Air Circuit Breaker Maintenance  
 M-C-700-220, Rev. 6, 480 Volt Load Center Inspection and Cleaning  
 M-C-700-228, Rev. 6, Maintenance of GE Type AKF-2-25 Circuit Breakers  
 M-C-700-230, Rev. 11, 480 Volt ABB/ITE Load Center Breaker Maintenance

M-C-700-231, Rev. 7, ITE (Brown Boveri) K-Line Static Circuit Breaker Calibration  
 M-C-700-232, Rev. 11, Testing and Control of 600V Class Molded Case Breaker & Setpoints  
 M-C-700-238, Rev. 0, Insulation Resistance Testing of Breakers  
 CC-AA-209, Rev. 1, Fire Protection Program Configuration Change Review  
 CC-AA-211, Rev. 1, Fire protection Program  
 CC-AA-211-1001, Rev. 0, Generic letter 86-10 Evaluations  
 OP-AA-201-001, Rev. 2, Fire Marshall Tours  
 CC-MA-209-1001, Rev. 0, Fire Protection Program Configuration Change Review  
 OP-AA-201-002, Rev. 1, Fire Reports  
 OP-AA-201-003, Rev.6, Fire Drill Performance  
 OP-AA-201-005, Rev. 3, Fire Brigade Qualification  
 OP-AA-201-006, Rev. 0, Control of Temporary Heat Sources  
 OP-AA-201-008, Rev. 1, Pre-Fire Plans  
 OP-AA-201-009, Rev. 4, Control of Transient Combustible Material  
 OP-MA-201-004, Rev. 0, Fire Prevention For Hot Work  
 OP-MA-201-007, Rev. 1, Fire Protection Systems Impairment Control  
 OP-LG-108-103-1101, Rev. 4, LGS Unit 1 Locked Valve List  
 RT-6-000-900-0, Rev. 12, Inspection of Safe Shutdown Equipment  
 RT-6-000-994-0, Rev. 6, Verification of Operator Qualifications  
 RT-2-085-600-2, Rev. 9, Functional Test of Alternate Communication System  
 RT-2-108-300-0, Rev. 4, Appendix R ELU 8 hour Capacity Verification Test  
 RT-2-108-300-1, Rev. 3, Appendix R ELU 8 hour Capacity Verification Test  
 RT-6-000-362-1 Rev. 5 Locked Breaker Check  
 RT-2-108-300-2, Rev. 3, Appendix R ELU 8 Hour Capacity Verification Test  
 RT-6-078-322-0, Rev. 08, Fire Safe Shutdown Mobile D/G Operability Test  
 S88.1.A, Rev. 16, Remote Shutdown Panel Controls  
 S88.1.A, Rev. 12, Check-off List  
 S49.1.A, Rev. 18, Normal Automatic RCIC Lineup  
 S49.1.B, Rev. 15, RCIC Trip/Isolation Recovery  
 ST-2-022-601-2, Rev. 9, Fire Detection - Fire Detection Instrumentation Channel Functional  
 Test and Supervisory Circuit Operability Test, Zones 7, 10A, 10B, 11, 16, 17, 18, 19  
 ST-2-022-603-0, Rev. 17, Fire Detection - Smoke Detection Instrumentation Channel  
 Functional Test and Supervisory Circuit Operability Test, Zones 24A, B, C, D, E, F  
 and G  
 ST-2-022-610-1, Rev. 15, Fire Detection - Smoke Detection Instrumentation Channel  
 Functional Test, Zones 45A, 45B, 45C  
 ST-2-022-620-2, Rev. 13, Fire Detection - Fire Detection Instrumentation Channel Functional  
 Test and Supervisory Circuit Operability Test, Zone 83  
 ST-2-022-642-1, Rev. 9, Fire Detection - Heat Detection Instrumentation Channel Functional  
 Test and Supervisory Circuit Operability Test, Zones 45A, 45B  
 ST-2-022-730-2, Rev. 1, Fire Spray/Sprinkler System Air Flow Operability Verification  
 ST-2-055-101-1, Rev. 6, HPCI Logic Isolation Test  
 ST-2-055-101-2, Rev. 10, HPCI Logic Isolation Test  
 ST-4-022-920-1, Rev. 3, Fire Rated Assembly Inspection  
 ST-4-022-920-2, Rev. 2, Fire Rated Assembly Inspection  
 ST-4-022-921-0, Rev. 0, Fire Damper Inspection/Functional Test  
 ST-4-022-922-2, Rev. 0, Fire Penetration Test Sample Visual Inspection  
 ST-4-022-924-0, Rev. 3, Unit 1 and Common Encapsulated Raceway Inspection  
 ST-6-022-250-0, Rev. 2, Underground Fire Main Flow Test

ST-6-022-251-0, Rev. 17, Motor Driven Fire Pump Flow Test  
ST-6-022-252-0, Rev. 22, Diesel Driven Fire pump Flow Test  
ST-6-022-253-0, Rev. 1, Diesel Driven Fire pump Characteristic Curve Test  
ST-6-022-254-0, Rev. 0, Motor Driven Fire pump Characteristic Curve Test  
ST-6-022-320-0, Rev. 14, Unit 1 and Common FSWS Operability Verification  
ST-6-022-551-0, Rev. 4, Fire Drill conducted 07/28/04, 08/04/04, and 08/18/04  
S22.8.H, Rev. 17, Inoperable Fire Protection Equipment Actions  
SE-6, Rev. 24, Alternate Remote Shutdown  
SE-8, Rev. 26, Fire  
S22.9.B, Rev. 2, Routine Inspection of All Fire Pumps  
ST-2-088-320-0, Rev.0, dated 6/28/02, Remote Shutdown System ESW AND RHRSW Operability Test  
ST-2-088-320-1, Rev.9, dated 6/05/03, Remote Shutdown System RCIC Operability Test  
ST-2-088-321-1, Rev.14, dated 6/30/04, Remote Shutdown System Div. I RHR Operability Test  
ST-2-088-322-1,Rev. 11, dated 4/02/04, Remote Shutdown System Safety Relief Valves RHR Operability Test  
ST-2-088-322-2, Rev. 6, dated 4/15/03, Remote Shutdown System Safety Relief Valves RHR Operability Test  
ST-2-088-323-1, Rev. 5, dated 7/30/04, Remote Shutdown System Safeguard Breaker Operability Test  
ST-2-088-323-2, Rev. 5, dated 6/05/03, Remote Shutdown System Safeguard Breaker Operability Test  
ST-2-088-324-1, Rev. 1, dated 2/06/03, Remote Shutdown System Div. II-RHR & Recirc. Suction Valve Operability Test

#### Fire Safe Shutdown Guides

2FSSG-3016, Rev. 0, Fire Area 016 Fire Guide  
1FSSG-3024, Rev. 0, Fire Area 024 Fire Guide  
2FSSG-3024, Rev. 0, Fire Area 024 Fire Guide  
1FSSG-3045E, Rev. 0, Fire Area 045E Fire Guide  
1FSSG-3045W, Rev. 0, Fire Area 045W Fire Guide  
1FSSG-3083, Rev. 0, Fire Area 083 Fire Guide  
2FSSG-3083, Rev. 0, Fire Area 083 Fire Guide

#### Drawings

Viking Drawing FP-30, Rev. 6, Diesel Generator Enclosures Diesel Gen. Bldg. - Unit #2 Elev. 217'-0 - Pre- Action System  
Viking Drawing FP-45, Rev. 6, Reactor Bldg. Neutron Monitoring Area  
Viking Drawing FP-6, Rev. 15, Radwaste & Reactor Bldg. #1 Elevations Vary Wet Pipe Systems  
Viking Drawing FP-42, Rev. 8, Hatchway, Unit #1 Reactor Building  
Viking Drawing FP-38, Rev. 6, Water Curtain - Unit #1, Reactor Building  
Viking Drawing FP-43, Rev. 6, Hatchway Unit #1 Reactor Bldg  
Viking Drawing FP-41, Rev. 4, Hatchway Protection, Unit #1 Reactor Building  
8031-A-40-681, Rev. 1, Penetration Seal Design, Penetration #681-P001  
PSA-761, Rev. 8, Penetration Seal Design, Penetration #761-E004  
M - 22 Sheets 1-11, P&ID, Fire Protection (Unit 1, Unit 2 and Common)

## A-5

M - 1084, Rev. 24, Heating and Ventilating, Reactor Bldg Unit No. 1, Plan at El. 253'-0" Area 15  
M - 1092, Rev. 24, Heating and Ventilating, Reactor Bldg Unit No. 1, Plan at El. 253'-0" Area 16  
E-1 Sh.1, Rev. 24, Single Line Diagram Station  
E-15, Single Line Meter & Relay Diagram - 4 kV Safeguard Power System, Unit 1  
E-16, Rev. 22, Single Line Meter & Relay Diagram - 4 kV Safeguard Power System, Unit 2  
E-20, Rev. 7, Single Line Meter & Relay Diagram - Diesel Generators Unit 1 & 2  
E-24, Rev. 19, Single Line Meter & Relay Diagram - Load Center Load Tabulation-Safeguard Load Centers Units 1 & 2125/250 Vdc System, Unit 2  
E-29, Rev. 17, Single Line Meter & Relay Diagram - D214, D224, D234, D2444-Safeguard Load Center, 440V-Unit 2  
E-31, Sh.3, Rev. 19, Single Line Meter & Relay Diagram-Instrumentation AC System, Unit 2  
E-33, Single Line Meter & Relay Diagram - 125/250 Vdc System, Unit 1  
E-34, Sh.1, Rev. 34, Single Line Meter & Relay Diagram - 125/250 Vdc System, Unit 2  
E-34, Sh.2, Rev. 35, Single Line Meter & Relay Diagram - 125/250 Vdc System, Unit 2  
E-36, Rev.13, Single Line Meter & Relay Diagram - Totalizing Demand Metering Unit 1 & 2  
E-68, Sh. 1 & 2, MCC Tabulation Drawings  
E-76, Schematic Meter & Relay Diag -13.2 kV Station Auxiliary Power System, Unit 1  
E-77, Schematic Meter & Relay Diag -13.2 kV Station Auxiliary Power System, Unit 2  
E-81, Sh.1, Rev. 20, Schematic Meter & Relay Diagram-D13 & D14 Safeguard Buses 4 kV Unit 1  
E-85, Sh. 1, Rev.18, Schematic Meter & Relay Diagram- Diesel Generators, 4 kV Unit 1 & 2  
E-85, Sh.2 , Rev.11, Schematic Meter & Relay Diagram-Diesel Generators, 4 kV Unit 1 & 2  
E-101, Sh. 2, Rev. 24, Schematic Block Diagram Nuclear Steam Supply Shutoff system Units 1 & 2  
E-102, Schematic Block Diagram RHR System Units 1 & 2  
E-105, Sh.1, Rev. 35, Schematic Block Diagram RCIC System Units 1 & 2  
E-115, Schematic Block Diagram - PGCC SITS Cables  
E-110, Rev. 17, Schematic Block Diagram ADS and SLC Systems Units 1 & 2  
E-156, Schematic Diagram - 101 and 201 Safeguards Transformer Breakers  
E-160, Schematic Diagram - Safeguard Buses 101 and 201 Breakers  
E-164, Sh. 5, Rev. 6, Schematic Diagram - Safeguard Buses D11 to D24 Generator Brkrs 4 KV-Units 1 & 2  
E-168, Rev. 6, Schematic Diagram D11 to D24 Safeguard Buses 4 KV-Units 1 & 2  
E-360, Sh 1 & 3, Schematic Diagram - RHR Pumps Units 1 & 2  
E-361, Sh. 1 & 2, Schematic Diagram - RHR Service Water Pumps-Common  
E-453, Sh.1, Rev. 15, Schematic Diagram - Turbine Enclosure Equipment Compartment Exhaust Fan  
E-522, Rev 17, Schematic Diagram - Control Enclosures-Battery Room Exhaust & Recirculating Dampers-Common  
E-591, Sh. 16, Rev.1, Schematic Diagram - D22 Diesel Generator Control and Auxiliaries  
E684, Sh. 1, Rev. 26, Schematic Diagram - NSSS Systems Miscellaneous Instrumentation Units 1 & 2

### Loop Diagram

M-0888, Sh.7, Rev.6, Loop Diagram Miscellaneous- Nuclear Boiler Vessel Instrument Unit 1  
M-0888, Sh.9, Rev.5, Loop Diagram Miscellaneous- Nuclear Boiler Vessel Instrument Unit 1



Elementary Drawings

M-1-E11-1040-E-005 through 054 - Elementary Diagram - Residual Heat Removal System  
M-1-B21-1060-E-001 through 019 - Elementary Diagram - Auto Depressurization System  
M-1-B21-1090-E-027, Sh. 6A, Rev 8,- Elementary Diagram - Nuclear Steam Supply Shutoff System  
M-1-E51-1040-E-005 through 39, Reactor Core Isolation System  
1-C61-1050-E-010, Rev 40- Remote Shutdown System-Unit 1

Piping and Instrumentation Drawings

M-0011, Emergency Service Water  
M-0012, RHR Service Water  
M-0041, Nuclear Boiler  
M-0042, Nuclear Boiler Vessel Instrumentation  
M-0049, Reactor Core Isolation Cooling (RCIC)  
M-0050, RCIC Pump/Turbine  
M-0051, Residual Heat Removal  
M-0052, Core Spray  
M-0055, High Pressure Coolant Injection (HPCI)  
M-0056, HPCI Pump/Turbine

Job Performance Measures

LLOJPM0227, Rev. 4, Emergency RCIC Power  
LLOJPM0205, Rev. 6, Place RCIC in Service at the Remote Shutdown Panel  
LLOJPM0250, Rev. 5, Emergency RCIC Power  
LLOJPM0267, Rev. 1, Align LPCI

Miscellaneous

Technical Specification 3.3.7.4 and Table 3.3.7.4-1  
RHR-NLOCT0405 RHR Lesson Plan  
LLOR0403D SE-1 and SE-6 Licensed Operator Re-qualification In-plant Training  
PEC-50319 PECO Power Lab Switch Testing Report  
Limerick Generation Station UFSAR, Rev. 6, Section 9.5, Fire Protection Program  
Pre-Fire Plan F-A-430, Rev. 3, Unit 2 D24 Emergency 4 kV Switchgear Room (ELEV. 239') Fire Area 16  
Pre-Fire Plan F-A-315A, Rev. 4, D21 Diesel Generator and Fuel Oil/Lube Oil Tank Room 315A and 316A (ELEV. 217') Fire Area 83  
Pre-Fire Plan F-A-533, Rev. 7, Unit 1 Control Room 533 and Peripheral Rooms 530 to 535 (ELEV. 269') Fire Area 24  
NOSA-LIM-04-09, Fire Protection Program Audit dated September 9, 2004

**LIST OF ACRONYMS USED**

AR	Action Request
CR	Condition Report
DBD	Design Basis Document
ELU	Emergency Light Unit
FHA	Fire Hazards Analysis
IP	Inspection Procedure
IPEEE	Individual Plant Evaluation for External Events
kV	Thousand Volts
LGS	Limerick Generating Station
NRC	Nuclear Regulatory Commission
P&ID	Piping and Instrumentation Drawing
RSP	Remote Shutdown Panel
SCBA	Self Contained Breathing Apparatus
SER	Safety Evaluation Report
UFSAR	Updated Final Safety Analysis Report