UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION I
2100 RENAISSANCE BLVD., SUITE 100
KING OF PRUSSIA, PENNSYLVANIA 19406-2713

March 14, 2019

Mr. Bryan C. Hanson
Senior Vice President, Exelon Generation Company, LLC
President and Chief Nuclear Officer, Exelon Nuclear
4300 Winfield Road
Warrenville, IL 60555

SUBJECT: LIMERICK GENERATING STATION, UNITS 1 AND 2 – TRIENNIAL FIRE PROTECTION INSPECTION REPORT 05000352/2019011 AND 05000353/2019011

Dear Mr. Hanson:

On February 15, 2019, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at your Limerick Generating Station (Limerick), Units 1 and 2, and discussed the results of this inspection with Mr. Rick Libra, Site Vice President and other members of your staff. The results of this inspection are documented in the enclosed report.

NRC inspectors documented one finding of very low safety significance (Green) in this report. The finding did not involve a violation of NRC requirements.

If you disagree with a cross-cutting aspect assignment or a finding not associated with a regulatory requirement in this report, you should provide a response within 30 days of the date of this inspection report, with the basis for your disagreement, to the U.S. Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington, DC 20555-0001; with copies to the Regional Administrator, Region I; and the NRC resident inspector at Limerick.

This letter, its enclosure, and your response (if any) will be made available for public inspection and copying at http://www.nrc.gov/reading-rm/adams.html and at the NRC Public Document Room in accordance with 10 CFR 2.390, "Public Inspections, Exemptions, Requests for Withholding."

Sincerely,

/RA/

Glenn T. Dentel, Chief
Engineering Branch 2
Division of Reactor Safety

Docket Nos. 05000352 and 05000353
License Nos. NPF-39 and NPF-85

Enclosure:
Inspection Report 05000352/2019011 and
05000353/2019011

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SUBJECT: LIMERICK GENERATING STATION, UNITS 1 AND 2 – TRIENNIAL FIRE PROTECTION INSPECTION REPORT 05000352/2019011 AND 05000353/2019011 DATED MARCH 14, 2019

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U.S. NUCLEAR REGULATORY COMMISSION
Inspection Report

Docket Numbers:	05000352 and 05000353
License Numbers:	NPF-39 and NPF-85
Report Numbers:	05000352/2019011 and 05000353/2019011
Enterprise Identifier:	I-2019-011-0013
Licensee:	Exelon Generation Co., LLC
Facility:	Limerick Generating Station, Units 1 and 2
Location:	Sanatoga, PA 19464
Inspection Dates:	January 28, 2019 to February 15, 2019
Inspectors:	C. Bickett, Senior Reactor Inspector E. DiPaolo, Senior Reactor Inspector J. Lilliendahl, Senior Emergency Response Coordinator A. Patel, Senior Reactor Inspector
Approved By:	Glenn T. Dentel, Chief Engineering Branch 2 Division of Reactor Safety

SUMMARY

The U.S. Nuclear Regulatory Commission (NRC) continued monitoring the licensee's performance by conducting a triennial fire protection inspection at Limerick Units 1 and 2 in accordance with the Reactor Oversight Process. The Reactor Oversight Process is the NRC's program for overseeing the safe operation of commercial nuclear power reactors. Refer to https://www.nrc.gov/reactors/operating/oversight.html for more information. Findings and violations being considered in the NRC's assessment are summarized in the table below.

List of Findings and Violations

Inadequate Functionality Assessment of the Diesel Driven Fire Pump			
Cornerstone	Significance	Cross-cutting Aspect	Report Section
Mitigating Systems	Green FIN 05000352,05000353/2019011-01 Open/Closed	[P.2] - Evaluation	71111.05T
The inspectors identified a Green finding associated with Exelon procedure, OP-AA-108-115, "Operability Determinations," because operators did not perform adequate functionality assessments of the diesel driven fire pump (DDFP) when excess cooling water strainer screen fouling was found following pump testing. Specifically, the functionality assessments did not adequately address the pump's ability to meet its Updated Final Safety Analysis Report described function, including mission time, following the discovery of unexpected fouling of the engine's cooling water strainer screen.			

INSPECTION SCOPES

Inspections were conducted using the appropriate portions of the inspection procedures (IPs) in effect at the beginning of the inspection unless otherwise noted. Currently approved IPs with their attached revision histories are located on the public website at http://www.nrc.gov/reading-rm/doc-collections/insp-manual/inspection-procedure/index.html. Samples were declared complete when the IP requirements most appropriate to the inspection activity were met consistent with Inspection Manual Chapter (IMC) 2515, "Light-Water Reactor Inspection Program - Operations Phase." The inspectors reviewed selected procedures and records, observed activities, and interviewed personnel to assess licensee performance and compliance with Commission rules and regulations, license conditions, site procedures, and standards.

REACTOR SAFETY

71111.05T - Fire Protection (Triennial)

02.02 Fire Protection Inspection Requirements (4 Samples)

The inspectors evaluated fire protection program implementation in the following selected areas and/or fire zones, including analyzed electrical circuits:

(1) 13.2KV Switchgear Area (Fire Area 2)
(2) Unit 1 Safeguard System Isolation Valve Area (Fire Area 43)
(3) Unit 2 Cable Spreading Room (Fire Area 23)
(4) Unit 2 Standby Liquid Control and General Equipment Areas (Fire Area 70W)

In performing this review, the inspectors performed an analysis of the following electrical circuits:

(1) 0AP548, Emergency Service Water Pump A
(2) FI-49-1R001-1, Reactor Core Isolation Cooling Pump Discharge Line Flow Indicator (Remote Shutdown Panel)
(3) HV-11-132A, Emergency Service Water Primary Return Valve for D11 Emergency Diesel Generator
(4) HV-50-2F045, Reactor Core Isolation Cooling Steam Supply Line Inlet Valve

02.03 B.5.b Inspection Activities (1 Sample)

The inspectors evaluated the following B.5.b Mitigating Strategies:

(1) T-200 Primary Containment Emergency Venting without Power

INSPECTION RESULTS

Inadequate Functionality Assessment of the Diesel Driven Fire Pump			
Cornerstone	Significance	Cross-cutting Aspect	Report Section
Mitigating Systems	Green FIN 05000352,05000353/2019011-01 Open/Closed	[P.2] - Evaluation	71111.05T

The inspectors identified a Green finding associated with Exelon procedure, OP-AA-108-115, "Operability Determinations," because operators did not perform adequate functionality assessments of the diesel driven fire pump (DDFP) when excess cooling water strainer screen fouling was found following pump testing. Specifically, the functionality assessments did not adequately address the pump's ability to meet its Updated Final Safety Analysis Report described function, including mission time, following the discovery of unexpected fouling of the engine's cooling water strainer screen.

Description: The DDFP is one of two standby fire water sources which automatically start on low fire header pressure. The other normal source is the electric motor driven fire pump. Both fire pumps use the basin from either the Unit 1 or Unit 2 cooling tower as their water source. Makeup to the cooling towers is from the Schuylkill River which contains silt and other suspended solids. There is a third backup DDFP that has a different water source and requires operator actions to be placed in service. The fire pumps are also listed as an alternate reactor pressure vessel injection source in emergency operating procedure T-101, "Reactor Pressure Vessel Control (RC/Q, RC/L, and RC/P)."

ST-6-022-252-0, "DDFP Flow Test," requires that the DDFP be operated at 2000 gpm for a minimum of 30 minutes. During review of tests completed per ST-6-022-252-0, the inspectors noted that the procedure required examination and cleaning of the engine's cooling water inlet strainer screen (YS-022-014) after engine shutdown. The engine's cooling water is taken from the pump's discharge, through isolation valves, the strainer screen, a pressure control valve, and a solenoid shutoff valve which opens on engine startup. The water is then supplied to the engine's cooling water heat exchanger to remove heat from the engine's closed loop cooling water system. Per ST-6-022-252-0, operators record the as-found condition of the strainer screen, and generate an issue report if the strainer screen was fouled 50 percent or greater. A review of historical as-found data revealed many instances when strainer screen fouling was found to meet or exceed this criteria. The worst case as-found condition was in June 2018 when the strainer screen was documented as 75–100 percent fouled following 34 minutes of runtime.

The inspectors reviewed Issue Report 4149722 which documented the June 2018 as-found condition of the strainer screen. Operators determined that the DDFP was functional/operable per the Technical Requirements Manual based on: (1) the DDFP was maintaining fire header pressure even with the as-found strainer screen fouling; and (2) cooling water strainer bypass valves were available to be opened to help maintain proper engine temperature. This justification was typical, if not identical, to other functionality determinations documented in issue reports generated as a result of the as-found condition following testing.

The inspectors also noted that strainer screen cleaning was implemented following an engine overheating event in July 2015, as documented in Issue Report 2522850. Up until that time, the strainer screen was only flushed following DDFP testing. Issue Report 2522850 determined that screen flushing was ineffective and instituted strainer screen cleaning following testing. This was done to "ensure the screen is always clean for the next pump start, which provides assurance the pump will be able to run without the engine overheating prior to completing its mission time of two hours." Issue Report 2522850 also documented that "it was not clear if the fouling is occurring during the start or if it's a slow loading of material during runs."

For fire events, the DDFP needs to operate for a minimum of two hours to fulfill its mission. The mission time would be even longer if operators utilized the pump as an alternate reactor pressure vessel injection source in T-101. Because the DDFP was typically only run for about 30 minutes during each test, and the fouling mechanism was not fully understood, as

documented in Issue Report 2522850, the inspectors determined the functionality assessments did not meet the requirements of Exelon procedure OP-AA-108-115. Specifically, the station did not address the pump's ability to meet its Updated Final Safety Analysis Report described function, including mission time, given the apparent rate of fouling.

The inspectors also noted that the alarm response procedure that would be entered during an engine overheating event, ARC-MCR-005, B-5, "Diesel Fire Pump Raw Water Hi Temperature," only directed opening of one of the two required isolation valves for the strainer bypass line. Additionally, the functionality assessments relied upon a non-documented compensatory measure to open both strainer bypass valves to maintain proper engine temperature. This action, if performed, would subject the engine's heat exchanger to full pump discharge pressure (>125 psig at rated flow) resulting in pressurizing the engine's heat exchanger above design pressure of 65 psig. Therefore, the inspectors concluded that these actions would not maintain functionality of the DDFP.

Corrective Actions: Exelon placed this issue into the corrective action program and planned actions to further evaluate the strainer screen fouling mechanism. Also, Exelon revised ARC-MCR-005, B-5, "Diesel Fire Pump Raw Water Hi Temperature," to properly line up the cooling water strainer bypass lines and control cooling water pressure to the engine.

Corrective Action References: Issue Reports 4220058 and 4219061

Performance Assessment:

Performance Deficiency: The inspectors determined that failure to perform adequate functionality assessments of the DDFP in accordance with Exelon procedure OP-AA-108-115, "Operability Determinations," was a performance deficiency. OP-AA-108-115 states that for an assessment that a structure, system, or component is functional, there must be a reasonable expectation that the structure, system, or component can perform its specified functions. Exelon procedure OP-AA-108-115-1002, "Supplemental Consideration for On-Shift Immediate Operability Determinations," Revision 3, states, in part, that the ability of a system, structure, or component to fulfill its mission/duty cycle is thoroughly assessed. Exelon's functionality assessments were inadequate because they did not address the pump's ability to meet its Updated Final Safety Analysis Report described function, including mission time, following the discovery of unexpected fouling of the engine's cooling water strainer screen. In addition, the functionality assessments relied upon a non-documented compensatory measure to open the strainer bypass valves to maintain proper engine temperature. This action, if performed, would result in pressurizing the engine's heat exchanger above design pressure which also could affect the pump's functionality.

Screening: The inspectors determined the performance deficiency was more than minor because it was associated with the Protection Against External Factors attribute of the Mitigating Systems cornerstone. The finding affected the Mitigating Systems cornerstone objective to ensure the availability and reliability of systems that respond to initiating events to prevent undesirable consequences. Specifically, fouling of the engine's cooling water strainer screen could have caused reduced cooling water flow to the engine's heat exchanger, resulting in the engine overheating during a postulated fire or emergency event and, therefore, affect the availability and reliability of the DDFP to perform its function.

Significance: The inspectors assessed the significance of the finding using Appendix F, "Fire Protection and Post - Fire Safe Shutdown SDP." Appendix F was applicable in this case because the finding was associated with the fire water system and affected fixed fire protection

systems and the ability to confine a fire. Inspectors screened the issue in accordance with Figure F.1, "Phase 1 Flow Chart." A low degradation could not be assigned in Step 1.3, and there was no applicable qualitative screen in Step 1.4. An NRC Region 1 Senior Reactor Analyst evaluated the issue utilizing Limerick's fire probabilistic risk assessment in accordance with Step 1.5. The DDFP was determined to be important in both fire suppression activities and as an alternate low pressure make up source, specifically under conditions in which the motor driven fire pump was unavailable either due to fire-induced damage or loss of power.

The loading of the cooling strainer screen was variable over the last year ranging from negligible to heavy. Even under heavy loading conditions, the engine was capable of running for at least 30 minutes at rated conditions. Based on the guidance provided in the "Risk Assessment of Operational Events," Volume 1, Section 2.4, for a failure that could have occurred at any time since the component was last operated (e.g., time of actual failure cannot be determined due to the nature of the failure mechanism), the exposure time (T) was equal to one-half of the time period since the last successful functional operation of the component (T/2) plus repair time. Given that over the past year the pump was operated monthly for testing and to account for repairs, an evaluated exposure time of 185 days was determined to be appropriate.

The evaluation performed with Limerick's fire probabilistic risk assessment resulted in a change in core damage frequency of approximately 1.7E-7/yr. This was determined to be conservative given that no credit was assigned for the DDFP run time before failure, recovery of the DDFP, the backup DDFP, or other FLEX equipment.

Additionally, since the DDFP is credited for alternate reactor pressure vessel injection during non-fire internal events, those cases were evaluated. Assuming the same exposure period as above, the maximum change in core damage frequency was determined to be approximately 3E-7/year. This was dominated by station blackout events in which alternate reactor pressure vessel injection could not credit the motor driven fire pump. This was also considered conservative for the same reasons as stated above.

Based on the assumption and limitations of the condition, the total change in core damage frequency was estimated to be Green in the mid E-7/yr range.

Based upon a review of the dominant cutsets (loss of offsite power initiating events with subsequent failures of high pressure injection and alternate late term injection) the unavailability of the DDFP may result in an increase in Large Early Release Frequency. The Senior Reactor Analyst used a 0.1 Large Early Release Frequency factor to account for the probability that operators would take action to mitigate the consequences of a potential containment breach due to these postulated high pressure accident sequences. Consequently, the delta Large Early Release Frequency for this finding is mid E-8, or Green.

Cross-cutting Aspect: P.2 - Evaluation: The organization thoroughly evaluates issues to ensure that resolutions address causes and extent of conditions commensurate with their safety significance. Exelon staff did not thoroughly evaluate the issue associated with fouling of the DDFP cooling water strainer screen and its effect on pump functionality. [P.2]

Enforcement: Inspectors did not identify a violation of regulatory requirements associated with this finding.

EXIT MEETINGS AND DEBRIEFS

The inspectors verified no proprietary information was retained or documented in this report.

- On February 15, 2019, the inspector presented the triennial fire protection inspection results to Mr. Rick Libra, Site Vice President and other members of the licensee staff.

DOCUMENTS REVIEWED

Fire Protection Licensing and Design Basis Documents

LG-PRA-021.11, Limerick Generating Station Fire Probabilistic Risk Assessment Summary and Quantification Notebook, Revision 1, November 2018
Limerick Generating Station Updated Final Safety Analysis Report Appendix 9A, Fire Protection Evaluation Report, Revision 19, September 2018
Limerick Generating Station Updated Final Safety Analysis Report, Appendix 9A, Fire Protection Evaluation Report, Revision 14, September 2008
NE-117, Specification for an Individual Plant Examination of External Events for Severe Accident Vulnerabilities, Limerick Generating Station and Peach Bottom Atomic Power Station, Revision 0
NUREG-0991, Safety Evaluation Report Related to the Operation of Limerick Generating Station, Units 1 and 2, Supplements 1 through 9
Unit 1 Technical Requirements Manual, Revision 64
Unit 2 Technical Requirements Manual, Revision 63

Calculations, Analysis, and Engineering Evaluations

6900E.11, Load Center Circuit Breakers – Overcurrent Trip Devices, Revision 12
6900E.15, 125/250VDC Fuse Selection/Coordination Undervoltage Relay Setting, Revision 13
6900E.23, Safeguard 208/120V AC Panel Circuit Breaker Coordination, Revision 0
A-E90-VC-00001, Containment Overpressurization Evaluation, Revision 0
EC 618876, Carbon Dioxide Fill Line/Suppression System Abandonment, Revision 2
EC 619628, Unit 1 Reactor Recirculation Motor Oil Indication Approved Fire Protection Program Configuration Change Impact Review, Revision 1
EC 623751, Free Air Cable Installation for Unit 1 and Unit 1 Approved Fire Protection Program Configuration Change Impact Review, Revision 0
EC 423446, Adjustable Speed Drive Approved Fire Protection Program Configuration Change Impact Review, Revision 1
G-080-VC-0028, Safe Shutdown Analysis for Fire Events, Revision 0
LEAF-0011, Fire Area 2, 13.2kV Switchgear Room Localized Suppression, Revision 0
LF-0016-002, Fire Area 2 Fire Safe Shutdown Analysis, Revision 2B
LF-0016-015, Fire Area 15 Fire Safe Shutdown Analysis, Revision 0
LF-0016-023, Fire Area 23 Fire Safe Shutdown Analysis, Revision 1
LF-0016-023, Fire Area 23 Fire Safe Shutdown Analysis, Revision 1D
LF-0016-043E, Fire Area 43E Fire Safe Shutdown Analysis, Revision 0
LF-0016-043W, Fire Area 43W Fire Safe Shutdown Analysis, Revision 0
LF-0016-070W, Fire Area 2 Fire Safe Shutdown Analysis, Revision 0B
NE-294, Specification for Post-Fire Safe Shutdown Program Requirements, Revision 4

Drawings, Wiring, and Piping and Instrumentation Diagrams

8031-M-22, Fire Protection (Unit 1, Unit 2, and Common), Sheets 1 through 10, Revision 70
C61-1050-E-001, Elementary Diagram, Remote Shutdown System, Revision 63
C61-1050-E-003, Elementary Diagram, Remote Shutdown System, Revision 49
C61-1050-E-015, Elementary Diagram, Remote Shutdown System, Revision 12
E-1, Sheet 1, Single Line Diagram, Station, Revision 31
E-105, Sheet 1, Schematic Block Diagram RCIC System, 35
E-321, Sheet 1, Schematic Diagram, Emergency Service Water Pumps, Revision 14
E-321, Sheet 6, Schematic Diagram, Emergency Service Water Pumps, Revision 19
E-322, Sheet 1, Schematic Diagram, ESW Inlet and Outlet MOVs, Revision 19
E51-1040-E-006, Elementary Diagram, Reactor Core Isolation, Revision 25

E51-1040-E-020, Elementary Diagram, Reactor Core Isolation, Revision 10
E51-1040-E-025, Elementary Diagram, Reactor Core Isolation, Revision 6
E51-1040-E-033, Elementary Diagram, RCIC, Revision 11
E51-1040-E-070, Elementary Diagram, RCIC, Revision 0
FP-34, Manual Control Sprinkler System, Revision 5
FP-58, Hatchway 6-Unit 2, Reactor Building, Revision 4
FP-65, Radwaste and Reactor Building-Unit 2, Wet Pipe Systems, Revision 4
M-049-275, Fire Protection System PR-107 (Fire Area 2) Control Area Floor Elevation 217' 00", Revision 1
M-11, Sheet 1, P&ID Emergency Service Water, Revision 88
M-49, Sheet 1, P&ID RCIC, Revision 52
M-50, RCIC Pump and Turbine, Revision 11

Quality Assurance Audits and Self-Assessments
Limerick Triennial Fire Protection Inspection Preparatory Self-Assessment (AR 4154286)
NOSA-LIM-18-06, Fire Protection Audit Report, October 1 – 12, 2018 (AR 4171364)

Issue Reports

0769756	0874599	0990255	1511763
1515025	1564123	2522850	2560374
2636038	2729935	2729959	2729978
2729982	2736143	2736687	2736807
2741426	3943610	3944053	3955705
3966977	4022237	4044082	4098359
4149722	4154286	4156585	4175638
4186355	4213319*	4213321*	4215562*
4216283*	4216395*	4216446*	4219061*
4219669*	4219673*	4219778*	4220058*
4220112*	4220114*		

Procedures
1FSSG-3002, Fire Area 002 Fire Guide, Revision 9
1FSSG-3015, Fire Area 015 Fire Guide, Revision 2
1FSSG-3043E, Fire Area 043E Fire Guide, Revision 0
2FSSG-3023, Fire Area 023 Fire Guide, Revision 9
2FSSG-3070W, Fire Area 070W Fire Guide, Revision 9
ARC-MCR-006 H6L, Spray Pond Pump Structure, Revision3
CC-AA-211, Fire Protection Program, Revision 8
CC-AA-211-1001, Fire Protection Engineering Evaluations, Revision 2
LS-AA-104-1000, 50.59 Resource Manual, Revision 12
LS-AA-128, Regulatory Review of Proposed Changes to the Approved Fire Protection Program, Revision 3
ON-121, Loss of Shutdown Cooling, Revision 32
OP-AA-102-106, Operator Response Time Program, Revision 4
OP-AA-201-003, Fire Drill Performance, Revision 16
OP-AA-201-004, Fire Prevention for Hot Work, Revision 15
OP-AA-201-005, Fire Brigade Qualification, Revision 9
OP-AA-201-007, Fire Protection System Impairment Control, Revision 0
OP-AA-201-008, Pre-Fire Plan Manual, Revision 4
OP-AA-209-009, Control of Transient Combustible Material, Revision 21
OP-LG-102-106, Operator Response Time Program at Limerick Station, Revision 8

OP-LG-103-102-1002, Strategies for Successful Transient Mitigation, Revision 32
OP-LG-201-008, Limerick Generating Station Fire Protection (F) Pre-Fire Plan Strategies, Revision 5
PI-AA-115, Operating Experience Program, Revision 4
Pre-Fire Plan F-A-336, 13.2KV Switchgear Room 336, Revision 15
Pre-Fire Plan F-A-450, Common, Unit 2 Cable Spreading Room, Revision 12
Pre-Fire Plan F-R-309, Unit 1, Safeguard Isolation Valve Area Room 309, Revision 11
Pre-Fire Plan F-R-574, Unit 2 Standby Liquid Control and General Equipment Areas, Reactor Water Cleanup Compartments, Fuel Pool Cooling Water Area, and Main Steam Tunnel, Rooms 574 Through 585, 593 and 594, Revision 16
RT-6-092-452-1, Procedure for De-energizing and Re-energizing the D12 Safeguard Bus during a Refueling Outage, Revision 12
RT-6-092-452-2, Procedure for De-energizing and Re-energizing the D22 Safeguard Bus during a Refueling Outage, Revision 10
RT-6-108-300-0, Fire Safe Shutdown Emerg Lighting Unit Operability Verification, Revision 22
RT-6-108-300-1, Fire Safe Shutdown Emerg Lighting Unit Operability Verification, Revision 24
RT-6-108-300-2, Fire Safe Shutdown Emerg Lighting Unit Operability Verification, Revision 24
S22.1.H, Placing Backup Diesel Driven Fire Pump (10P402), Jockey Pump (10P400) and Batch Plant Well Pump in Service, Revision 31
SE-1, Remote Shutdown, Revision 75
SE-1-1, Protected Depressurization Control, Revision 16
SE-12, Loss of Communications, Revision 30
SE-1-2, Protected Power Source, Revision 14
SE-1-3, Protected Ventilation Source, Revision 19
SE-6, Alternate Remote Shutdown, Revision 32
SE-6-1, Protected Power Source, Revision 11
SE-8, Fire, Revision 57
ST-4-022-930-0, Unit Common TRM Fire Door Inspection, Revision 1
ST-4-022-930-1 Unit 1 TRM Fire Door Inspection, Revision 1
ST-4-022-930-2 Unit 2 TRM Fire Door Inspection, Revision 1
SY-AA-101-117, Processing and Escorting of Personnel and Vehicles, Revision 11
SY-LG-101-124, Duties and Responsibilities of Security Control Centers and Security Supervision at Limerick Generating Station, Revision 0
SY-LG-1016, Limerick Watch Standing Practices, Revision 11
T-200, Unit 2 Primary Containment Emergency Vent Procedure, Revision 28
T-341, Primary Containment Venting Via Hardened Vent System, Revision 0

Fire Brigade Drills and Critiques

ST-6-022-551-0, Fire Drill, performed on 7/12/18 (unannounced backshift drill on ‘D’ Crew)
ST-6-022-551-0, Fire Drill, performed on 7/24/18 (unannounced backshift drill on ‘B’ Crew)
ST-6-022-551-0, Fire Drill, performed on 8/2/18 (unannounced drill on ‘A’ Crew)
ST-6-022-551-0, Fire Drill, performed on 8/10/18 (announced drill on ‘C’ Crew)
ST-6-022-551-0, Fire Drill, performed on 9/15/18 (announced backshift drill on ‘E’ Crew)

Transient Combustible, Hot Work, and Ignition Source Permits and Evaluations

Hot Work Permit 5885, 1D-V112, dated 10/11/18
Hot Work Permit 6265, 2BC01, dated 11/5/18
Hot Work Permit 6331, 1A-E123, dated 10/1/18
Hot Work Permit 6446, 1A-V209, dated 10/8/18
Hot Work Permit 6584, BS-0101-270A, dated 12/5/18

Transient Combustible Permit 511, Diesel Generator Cell 1D Lube Oil Keep Warm Fail Video Camera for Temperature Monitoring, dated 12/14/18
Transient Combustible Permit 512, Diesel Generator Cell 2A Lube Oil Keep Warm Fail Video Camera for Temperature Monitoring, dated 12/17/18
Transient Combustible Permit 513, Diesel Generator Cell 2C Lube Oil Keep Warm Fail Video Camera for Temperature Monitoring, dated 12/17/18

Completed Tests and Surveillances
RT-6-000-913-0, Inspection of B.5.b. Security Order Equipment, completed 7/15/2018
RT-6-000-914-0, Inspection of Flex Pump Storage Building Equipment, completed 8/27/2018
RT-6-022-253-0, Backup Diesel Driven Fire Pump (10-P402) Characteristic Curve Test, completed 10/31/15
RT-6-022-253-0, Backup Diesel Driven Fire Pump (10-P402) Characteristic Curve Test, completed 7/3/17
RT-6-022-911-0, Inspection of Fire Brigade Lockers, completed on 7/11/18
ST-2-088-320-0, Remote Shutdown System ESW/RHRSW Operability Test, Completed 1/21/17
ST-2-088-320-1, Remote Shutdown System RCIC Operability Test, Completed 6/15/17
ST-2-088-320-2, Remote Shutdown System RCIC Operability Test, Completed 1/3/19
ST-6-022-250-0, Underground Fire Main Flow Test, completed 6/16/18
ST-6-022-251-0, Motor Driven Fire Pump Flow Test, completed on 11/8/18
ST-6-022-251-0, Motor Driven Fire Pump Flow Test, completed on 12/5/18
ST-6-022-253-0, Diesel Driven Fire Pump Characteristic Curve Test, completed 10/15/16
ST-6-022-253-0, Diesel Driven Fire Pump Characteristic Curve Test, completed 2/7/18
ST-6-022-254-0, Motor Driven Fire Pump Characteristic Curve Test, completed 6/26/16
ST-6-022-254-0, Motor Driven Fire Pump Characteristic Curve Test, completed 2/22/18
ST-6-022-600-0, Fire Suppression Water System Flush, completed 11/25/18

Miscellaneous Documents
EC LG 13-00006, Replace SV-022-014-014 to Address Chronic Leakage, Revision 0
EC LG 98-01962, Darmatt KM1 Installation FBS#43-01 and 43-02, Revision 1
EC LG 98-03030, Darmatt Fire Barrier Qualification Reports, Revision 0
Fire Protection Program Health Report, 2017, Period 2
Fire Protection Program Health Report, 2018, Period 1
Fire System Impairment 00000127, Control Room Fire Annunciator Panel 006, dated 12/18/16
Fire System Impairment 00006328, Set-Up Diesel Generator Trailer, dated 12/4/18
Fire System Impairment 00007209, Fire Water Valve Exercise Test ST-6-022-760-1, dated 1/9/19
Fire System Impairment 00007313, Unit1 Auxiliary Transformer Fire Panel, dated 1/9/19
LEOC-1803, FLEX and B.5.b. Operations, Revision 0 (12/26/2018)
Letter of Agreement with Limerick Fire Company, dated January 2014
Letter of Agreement with Linfield Fire Company, dated March 14, 2018
LGSOPS2004, LGS Operations Initial Training - B.5.b., Revision 3 (3/27/2017)
LGSOPS2004, LGS Operations Initial Training - B.5.b., Revision 3a (6/23/2017)
Limerick Fire Company 2018 Letter of Agreement Update, dated September 2018
Limerick Generating Station, Units 1 and 2 – Conforming License Amendments to Incorporate the Mitigation Strategies Required by Section B.5.b. of Commission Order EA-02-026 and the Radiological Protection Mitigation Strategies Required by Commission Order EA-06-137, dated August 9, 2007
NRC Generic Letter 86-10, Implementation of Fire Protection Requirements, dated 4/24/86
Vendor Technical Manual M-019-00082, Diesel Driven Fire Pump Engine Operations and Maintenance Manual, dated 11/5/05