

February 6, 2006

U. S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, DC 20555-0001

Limerick Generating Station, Unit 1 and Unit 2
Facility Operating License Nos. NPF-39 and NPF-85
NRC Docket Nos. 50-352 and 50-353

Subject: LER 1-06-001, Loss Of One Offsite Circuit Due To Invalid Actuation Of Fire
Suppression System

This Licensee Event Report (LER) addresses a valid automatic actuation of the emergency AC electrical power system and the emergency service water system due to a trip of one offsite circuit. Also, invalid actuations of general containment signals affected containment isolation valves in more than one system. The "10" station auxiliary transformer tripped on a differential relay actuation following a spurious actuation of the fire suppression deluge system.

Report Number: 1-06-001
Revision: 00
Event Date: December 9, 2005
Discovered Date: December 9, 2005
Report Date: February 6, 2006

This LER is being submitted pursuant to the requirements of 10CFR50.73(a)(2)(iv)(A).

There are no commitments contained in this letter.

If you have any questions or require additional information, please do not hesitate to contact us.

Sincerely,

Original signed by

Ron J. DeGregorio
Vice President – Limerick
Exelon Generation Company, LLC

cc: S. J. Collins, Administrator Region I, USNRC
S. L. Hansell, USNRC Senior Resident Inspector, LGS

LICENSEE EVENT REPORT (LER)(See reverse for required number of
digits/characters for each block)

Estimated burden per response to comply with this mandatory collection request: 50 hours. Reported lessons learned are incorporated into the licensing process and fed back to industry. Send comments regarding burden estimate to the Records and FOIA/Privacy Service Branch (T-5 F52), U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, or by internet e-mail to infocollects@nrc.gov, and to the Desk Officer, Office of Information and Regulatory Affairs, NEOB-10202, (3150-0104), Office of Management and Budget, Washington, DC 20503. If a means used to impose an information collection does not display a currently valid OMB control number, the NRC may not conduct or sponsor, and a person is not required to respond to, the information collection.

1. FACILITY NAME

Limerick Generating Station, Unit 1

2. DOCKET NUMBER

05000352

3. PAGE

1 OF 4

4. TITLE

Loss Of One Offsite Circuit Due To Invalid Actuation Of Fire Suppression System

5. EVENT DATE			6. LER NUMBER			7. REPORT DATE			8. OTHER FACILITIES INVOLVED	
MONTH	DAY	YEAR	YEAR	SEQUENTIAL NUMBER	REV NO.	MONTH	DAY	YEAR	FACILITY NAME	DOCKET NUMBER
12	09	2005	2006	- 001 -	0	02	06	2006	Limerick Unit 2	05000353
									FACILITY NAME	DOCKET NUMBER
										05000

9. OPERATING MODE

1

11. THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR§: (Check all that apply)

<input type="checkbox"/> 20.2201(b)	<input type="checkbox"/> 20.2203(a)(3)(i)	<input type="checkbox"/> 50.73(a)(2)(i)(C)	<input type="checkbox"/> 50.73(a)(2)(vii)
<input type="checkbox"/> 20.2201(d)	<input type="checkbox"/> 20.2203(a)(3)(ii)	<input type="checkbox"/> 50.73(a)(2)(ii)(A)	<input type="checkbox"/> 50.73(a)(2)(viii)(A)
<input type="checkbox"/> 20.2203(a)(1)	<input type="checkbox"/> 20.2203(a)(4)	<input type="checkbox"/> 50.73(a)(2)(ii)(B)	<input type="checkbox"/> 50.73(a)(2)(viii)(B)
<input type="checkbox"/> 20.2203(a)(2)(i)	<input type="checkbox"/> 50.36(c)(1)(i)(A)	<input type="checkbox"/> 50.73(a)(2)(iii)	<input type="checkbox"/> 50.73(a)(2)(ix)(A)
<input type="checkbox"/> 20.2203(a)(2)(ii)	<input type="checkbox"/> 50.36(c)(1)(ii)(A)	<input checked="" type="checkbox"/> 50.73(a)(2)(iv)(A)	<input type="checkbox"/> 50.73(a)(2)(x)
<input type="checkbox"/> 20.2203(a)(2)(iii)	<input type="checkbox"/> 50.36(c)(2)	<input type="checkbox"/> 50.73(a)(2)(v)(A)	<input type="checkbox"/> 73.71(a)(4)
<input type="checkbox"/> 20.2203(a)(2)(iv)	<input type="checkbox"/> 50.46(a)(3)(ii)	<input type="checkbox"/> 50.73(a)(2)(v)(B)	<input type="checkbox"/> 73.71(a)(5)
<input type="checkbox"/> 20.2203(a)(2)(v)	<input type="checkbox"/> 50.73(a)(2)(i)(A)	<input type="checkbox"/> 50.73(a)(2)(v)(C)	<input type="checkbox"/> OTHER
<input type="checkbox"/> 20.2203(a)(2)(vi)	<input type="checkbox"/> 50.73(a)(2)(i)(B)	<input type="checkbox"/> 50.73(a)(2)(v)(D)	

Specify in Abstract below
or in NRC Form 366A

12. LICENSEE CONTACT FOR THIS LER

FACILITY NAME

Robert E. Kreider, Manager – Regulatory Assurance

TELEPHONE NUMBER (Include Area Code)

610-718-3400

13. COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT

CAUSE	SYSTEM	COMPONENT	MANU-FACTURER	REPORTABLE TO EPIX	CAUSE	SYSTEM	COMPONENT	MANU-FACTURER	REPORTABLE TO EPIX
X	FK	XFMR	M175	Y	X	KP	TS	256S	Y

14. SUPPLEMENTAL REPORT EXPECTED☐ YES (If yes, complete 15. EXPECTED SUBMISSION DATE)☒ NO**15. EXPECTED SUBMISSION DATE**

MONTH	DAY	YEAR

ABSTRACT (Limit to 1400 spaces, i.e., approximately 15 single-spaced typewritten lines)

One of two offsite circuits tripped due to a valid actuation of the "10" station auxiliary transformer protective relays. The actuation of the "A" phase differential relay was caused by a spurious actuation of the fire suppression deluge system. The tripping of the transformer de-energized the 13 kV feed from the 220 kV substation to the safeguard transformer. Four of eight 4kV safeguard busses were de-energized which resulted in four of eight emergency diesel generators (EDGs) automatically starting and running unloaded as designed. The 4 kV safeguard busses were automatically re-energized when four feeder breakers from the energized offsite circuit automatically closed as designed. Both loops of emergency service water (ESW) automatically started due to the start of the EDGs. The "10" station auxiliary transformer fire suppression deluge system manual isolation valve was closed to prevent automatic actuations. The "10" station auxiliary transformer was inspected, cleaned, tested and returned to service.

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Limerick Generating Station, Unit 1	05000352	2006	-- 001	-- 00	2 OF 4

NARRATIVE (If more space is required, use additional copies of NRC Form 366A) (17)

Unit Conditions Prior to the Event

Unit 1 was in Operational Condition (OPCON) 1 (Power Operation) at approximately 100% power. Unit 2 was in Operational Condition (OPCON) 1 (Power Operation) at approximately 100% power. There were no structures, systems or components out of service that contributed to this event.

Description of the Event

On Friday December 9, 2005, at 08:58 hours, the main control room (MCR) received alarms "10 Startup Transformer Water Spray" and "Motor Driven Fire Pump Running". At 09:01 hours, five circuit breakers (105, 25, 715, 725, 735) tripped and "10" Circuit Switcher opened in the 220 kV substation. The "10" Bus offsite circuit (OSC) was de-energized resulting in 4 of 8 (D11, D13, D22, D24) 4kV safeguard busses (EIIS:EB) automatically transferring to the energized "20" Bus OSC. In addition, 4 of 8 (D11, D13, D22, D24) emergency diesel generators (EDGs) (EIIS:EK) automatically started and ran unloaded as designed (all EDGs were secured by 15:12 hours). The 4kV bus transfer and EDG starts were as designed. Three of four Emergency Service Water (ESW) (EIIS:BI) pumps (A, C and D) automatically started to support the EDG operation. The "B" ESW pump received a start signal but was already in service to support a routine test at the time of the event. In addition, invalid isolation signals were caused by a momentary loss of instrument power (EIIS:EE), which resulted in isolation valve closures on more than one system.

"10" station auxiliary transformer (EIIS:XFMR) was inspected, cleaned, tested and returned to service. No equipment damage was identified during the inspection.

Operations addressed several equipment challenges during the event (all expected for this transient). A Group VIA (primary containment purge) isolation signal occurred on both units due to the loss of instrument power for the north stack radiation monitor. The reactor water cleanup (RWCU) systems tripped on both units. The containment leak detector radiation monitor isolation valves closed on both units. The "D" residual heat removal service water (RHRSW) pump tripped (running to support an ESW flow verification test). The "A" and "C" main control room radiation monitors tripped. The "B" and "C" auxiliary boilers tripped. Unit 1 Steam Jet Air Ejector (SJAE) air valves closed which caused hydrogen water chemistry (HWC) to trip. Unit 1 Steam Seal Evaporator makeup valve closed. The "1A" turbine enclosure equipment compartment exhaust (TEECE) fan tripped. The "2B" drywell chiller tripped. The "2B" fuel pool cooling pump tripped. The operators promptly restored the affected systems to normal operation.

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NARRATIVE (If more space is required, use additional copies of NRC Form 366A) (17)

Technical Specification (TS) 3.8.1.1, A.C. Sources – Operating, 72-hour action was entered on Friday December 9, 2005 at 09:01 hours on both units while one OSC was inoperable. The TS action was exited on Saturday December 10, 2005, at 18:00 hours, when the third OSC was declared operable. The failed OSC was declared operable on Sunday December 11, 2005, at 13:43 hours.

An 8-hour NRC ENS notification was required by 10CFR50.72(b)(3)(iv)(A) for a valid actuation of the emergency AC power system. The ENS notification (#42193) was completed on Friday December 9, 2005, at 13:15 EST. This event involved a valid automatic actuation of the emergency AC electrical power system and the emergency service water system. Also, invalid actuations of general containment signals affected containment isolation valves in more than one system. Therefore, this LER is being submitted pursuant to the requirements of 10CFR50.73(a)(2)(iv)(A).

Analysis of the Event

There were no actual safety consequences associated with this event. The potential safety consequences of this event were minimal. All emergency AC electrical power systems functioned as designed to re-energize the affected 4kV safeguard busses.

Limerick OSC design consists of one 13 kV circuit from the 220 kV substation and one 13 kV circuit from the 500 kV substation. The circuit from the 220 kV substation utilizes 10 station auxiliary transformer and "101" safeguard transformer to feed "101" safeguard 4 kV bus. The circuit from the 500 kV substation utilizes "4A" and "4B" station auto transformers, "20" regulating transformer and "201" Safeguard Transformer to feed "201" safeguard 4 kV bus. Each unit has four 4kV safeguard buses. Two 4kV safeguard buses on each unit are normally energized from "101" bus and two buses on each unit are normally energized from "201" bus.

The investigation identified that "10" station auxiliary transformer tripped on an "A" phase differential relay operation following a spurious actuation of the transformer fire suppression deluge system (EHS:KP). The deluge system sprinkler heads are angled to spray the transformer upper surface but a mist drifted into the area of the high voltage bushing. A combination of water misting, soluble chemicals, corrosion products and high voltage led to the isolation of the transformer. The mist caused arcing from the 220 kV bushing to the transformer shell. The subsequent differential relay operation caused all of the breakers connected to "10" transformer to trip.

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NARRATIVE (If more space is required, use additional copies of NRC Form 366A) (17)

The deluge system heat detector circuit (EIIS:IC) was visually inspected and no detectors indicated an actuation. Testing did not identify any short circuits or grounds. A sampling of 4 of 14 heat detectors was performed but they had no indications of internal corrosion. The four detectors were replaced. Maintenance on the circuit following a prior actuation had identified corrosion. Therefore, corrosion and/or moisture intrusion into the heat detector circuit was determined to be the likely cause of the actuation. The deluge system manual isolation valve was closed to prevent automatic actuation.

Cause of the Event

The trip of "10" transformer was caused by a spurious actuation of the fire suppression deluge system. The investigation of the cause of the spurious actuation determined that the most likely cause was a short circuit in the heat detector circuit as a result of moisture intrusion and/or corrosion. The mist from the fire water deluge spray caused arcing to ground at the "A" phase high voltage bushing and subsequent differential relay operation.

Corrective Action Completed

The "10" transformer fire suppression deluge system manual isolation valve was closed to prevent automatic actuation. Manual initiation of the deluge system will be required to spray the transformer.

Previous Similar Occurrences

There were two previous similar occurrences of loss of one OSC, which were reported in LER 1-05-002 and LER 1-93-011.

Component data:

System: FK (Switchyard System)
Component: XFMR (Transformer)
Manufacturer: M175 (McGraw Edison)
Serial number: C-04993-5-1

System: KP (Fire Protection System)
Component: TS (Switch, Temperature)
Manufacturer: 256S (Star Sprinkler)
Model: MPB