

**Exelon** Generation.

LG-16-083 July 27, 2016

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

> Limerick Generating Station, Unit 2 Renewed Facility Operating License No. NPF-85 NRC Docket No. 50-353

Subject: LER 2016-001-00, Manual Actuation of the Reactor Protection System

This Licensee Event Report (LER) addresses a manual actuation of the reactor protection system (RPS) following a trip of both reactor recirculation pumps. The pump trips occurred during testing of a modification to the Plant Process Computer (PPC). The manual scram was directed by the unexpected/unexplained change in core flow procedure (OT-112) due to the tripping of the reactor recirculation pumps at power. An error in the modification wiring design caused an actuation of the reactor recirculation pump trip relays.

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, please contact Robert B. Dickinson at (610) 718-3400.

Respectfully,

Ruk Ubra

Richard W. Libra Site Vice President – Limerick Generating Station Exelon Generation Company, LLC

cc: Administrator Region I, USNRC USNRC Senior Resident Inspector, LGS

NRC FORM 366 U.S. NUCLEAR REGULATORY COMMISSION (01-2014)							APPROVED BY OMB: NO. 3150-0104						EXPIRES: 01/31/2017					
(See Page 2 for required number of digits/characters for each block)							Estimated burden per response to comply with this mandatory collection request: 80 hours. Reported lessons learned are incorporated into the licensing process and fed back to industry. Send comments regarding burden estimate to the FOIA, Privacy and Information Collections Branch (T-5 F53), U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, or by internet e-mail to Infocollects. Resource@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							2. DO	DCK	(ET NUMBER	3. PA	GE							
Limerick Generating Station, Unit 2									05000353		1 OF 3							
4. TITLE Manu	al Actu	ation of	the Re	eactor P	rotection	Syste	m When	Criti	cal Di	ue t	to Wiring Des	ign Erro	or					
5. EVENT DATE		6. LER NUMBER			7	7. REPORT DATE				8. O	CILIT	IES INVOI	VED	)				
MONTH	DNTH DAY YEAR		YEAR SEQUENTIAL REV NUMBER NO.		MONT	MONTH DAY Y		'EAR	FACILITY NAME			DOCKET NUMBER			<sup>MBER</sup>			
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			20.2201(b)				20.2203(a)(3)(i)				50.73(a)(2)(i)(C)			50.73(a)(2)(vii)				
	1		20.2201(d)				20.2203(a)(3)(ii)				50.73(a)(2)(ii)(A)			50.73(a)(2)(viii)(A)				
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			20.2203(a)(2)(i)				50.36(c)(1)(i)(A)				50.73(a)(2)(iii)			50.73(a)(2)(ix)(A)				
10. POWER LEVEL			20.2203(a)(2)(ii)				50.36(c)(1)(ii)(A)			50.73(a)(2)(iv)(A)				50.73(a)(2)(x)				
			20.2203(a)(2)(iii)				50.36(c)(2)			50.73(a)(2)(v)(A)				73.71(a)(4)				
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			20.2203(a)(2)(v)				50.73(a)(2)(i)(A)			50.73(a)(2)(v)(C)				OTHER				
			20.2203(a)(2)(vi)				50.73(a)(2)(i)(B)		3)		50.73(a)(2)(v)(D)			Specify in Abstract below or in NRC Form 366A				
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			13. CO	MPLETE	ONE LINE	FOR E	ACH COMF	ONE	NT FA	ILU	RE DESCRIBED	IN THIS	REPO	ORT				
CAUSE		SYSTEM	CON	COMPONENT FAC		IU- REPORTABLE JRER TO EPIX			CAUSE	=	SYSTEM COMP		ONENT FAC		ACTURER		REPORTABLE TO EPIX	
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ABSTRA	CT (Limit	to 1400 sp	aces. i.e	approxima	telv 15 sinale	e-spaced	tvpewritten l	ines)			DA							
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NRC FORM 366A U.S. NUCLEAR REG	ULATORY COMMIS	SION APPROV	ED BY OMB:	NO. 315	50-0104	EXPI	RES: 01/	31/2017			
	ORT (LER) HEET	Estimated burden per response to comply with this mandatory collection request: 80 hours. Reported lessons learned are incorporated into the licensing process and fed back to industry. Send comments regarding burden estimate to the FOIA, Privacy and Information Collections Branch (T-5 F53). U.S. Nuclear Regulatory Commission, Washington, DC 2055-0001, or by internet e-mail to Infocollects.Resource@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		6. LER NUM	3. PAGE								
Limerick Generating Station, Unit 2	05000353	YEAR	SEQUEN NUMBE	SEQUENTIAL NUMBER		- 2	OF	3			
		2016	- 001	-	00						
NARRATIVE											
Unit Conditions Prior to the Event											
Unit 2 was in Operational Conditio with PPC modification testing in pr components out of service that co	Unit 2 was in Operational Condition (OPCON) 1 (Run) at approximately 100 percent power with PPC modification testing in progress. There were no structures, systems or components out of service that contributed to this event.										
Description of the Event											
On Wednesday, June 1, 2016, Lin PPC (EIIS:CPU) modification testi of a circuit isolation switch which r the modification wiring design. Th for an unexpected/unexplained ch The procedure directed a manual	On Wednesday, June 1, 2016, Limerick Unit 2 was operating at 100 percent power with PPC (EIIS:CPU) modification testing in progress. The modification testing directed closure of a circuit isolation switch which resulted in the trip of both RRPs (EIIS:P) due to an error in the modification wiring design. The control room supervisor (CRS) entered the procedure for an unexpected/unexplained change in core flow (OT-112) due to the trip of both RRPs. The procedure directed a manual actuation of RPS.										
All control rods inserted and safety level initially increased then decrea +12.5 inch low level setpoint for R Supply Shutoff System Groups IIA The digital feedwater level control pressure was controlled by the ma	All control rods inserted and safety significant systems functioned as expected. Reactor level initially increased then decreased to approximately +0 inches which is less than the +12.5 inch low level setpoint for RPS. Level then stabilized at normal level. Nuclear Steam Supply Shutoff System Groups IIA and IIB isolations actuated on low level at +12.5 inches. The digital feedwater level control system functioned as designed. Reactor pressure vessel pressure was controlled by the main steam bypass valves.										
The investigation of the event iden actuation of both RRP trip relays v the modification acceptance test p	The investigation of the event identified that a wiring design error caused an unplanned actuation of both RRP trip relays when a circuit isolation switch was closed as directed by the modification acceptance test procedure.										
A four-hour ENS notification (#519 hours as required by 10CFR50.72 critical. This LER is being submitt 10CFR50.73(a)(2)(iv)(A) for a mar	A four-hour ENS notification (#51968) was completed on Wednesday, June 1, 2016, at 1041 hours as required by 10CFR50.72(b)(2)(iv)(B) for an actuation of RPS when the reactor is critical. This LER is being submitted pursuant to the requirements of 10CFR50.73(a)(2)(iv)(A) for a manual actuation of RPS.										
Analysis of the Event	Analysis of the Event										
There was no actual safety conserved consequences of this event were r following the RPS actuation. The the 2B RRP was restarted at 0326	quence associ ninimal. All co 2A RRP was r hours on Jun	ated with th ontrol rods restarted at e 2, 2016.	nis event. were verif 1548 hou	The ied to irs on	potential be fully June 1,	safety inserted 2016 and	d				
The PPC replacement modification transferred from the original comp computer point was placed in serv RRP trip relays were energized du	n was in progre uter to the new ice by closure ie to an error i	ess and co v computer of a circuit n the wiring	mputer inp . When th isolation s design.	out po le seo switch	oints were cond RRI h both 2A	e being related and 2B					

NRC FORM 366A (01-2014)	LICEN	SEE EVENT I	REPORT ( ON SHEET	(LEF r	U.S. NUCL R)	EAR RE	GULATO	RY COM	VISSION		
1. FACILITY NAM	 /E	2. DOCKET	1	6. LEI	R NUMBER	3. PAGE					
Limerick Generating Station, U	Init 2	05000353	YEAR	S	EQUENTIAL NUMBER	REV NO.	3	OF	3		
		00000000	2016	-	001 -	00	Ū				
NARRATIVE			L				<u></u>				
Cause of the Event											
The direct cause of the field and caused energy field	ne event was a ci rgization of the R	ircuit wiring de ≀RP ASD trip c	sign error	<sup>-</sup> that	t was imple	emente	d in th	е			
The root cause of the prevention techniques modification.	event was a fail s to identify the c	ure of station r lesign error ar	personnel Id prevent	to a t its i	ppropriate	and te	y THU sting a	error s part c	of the		
Corrective Actions Co	Corrective Actions Completed										
The isolation switch for coils.	The isolation switch for the mis-wired circuit was opened to enable reset of the ASD trip coils.										
The 2A and 2B ASDs	The 2A and 2B ASDs were returned to service.										
Corrective Actions Pla	Corrective Actions Planned										
The wiring design error revised to ensure the Test Criteria.	The wiring design error will be corrected and the Modification Acceptance Test will be revised to ensure the change is correctly tested per the requirements of the Acceptance Test Criteria.										
The human performation management actions related to THU error t	The human performance aspects of the event will be addressed through several management actions that include reinforcement of proper standards and behaviors related to THU error techniques with station personnel.										
Previous Similar Occ	Previous Similar Occurrences										
There was no previou	There was no previous RPS actuation in the past five years due to modification testing.										
Component data	Component data										
System: Component: Component number: Component name: Manufacturer: Model number:	AD Reactor P Pump 2A-P201-DR Reactor Recircu G080 General 5K46385AA1	Recirculation ulation Pump Electric Comp	System bany								