



10 CFR 50.73

LG-18-008  
February 5, 2018

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

Limerick Generating Station, Unit 1  
Renewed Facility Operating License No. NPF-39  
NRC Docket No. 50-352

Subject: LER 2018-001-00, D12 EDG Inoperable for Greater than 30 Days Resulting in a Condition Prohibited by TS

Enclosed is a Licensee Event Report (LER) which addresses an Emergency Diesel Generator (EDG) being inoperable for greater than 30 days, resulting in a condition prohibited by Technical Specifications (TS) at Limerick Generating Station, Unit 1.

This LER is being submitted pursuant to the requirements of 10 CFR 50.73(a)(2)(i)(B), Operation or Condition Prohibited by TS.

There are no commitments contained in this letter.

If you have any questions, please contact Robert B. Dickinson at (610) 718-3400.

Respectfully,

  
F. STANISLO

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

cc: Administrator Region I, USNRC  
USNRC Senior Resident Inspector, Limerick Generating Station

<b>NRC FORM 366</b> (04-2017)		<b>U.S. NUCLEAR REGULATORY COMMISSION</b>			<b>APPROVED BY OMB: NO. 3150-0104</b>		<b>EXPIRES: 03/31/2020</b>				
<div style="display: flex; justify-content: space-between; align-items: center;"> <div style="text-align: center;"> <p><b>LICENSEE EVENT REPORT (LER)</b> (See Page 2 for required number of digits/characters for each block)</p> <p>(See NUREG-1022, R.3 for instruction and guidance for completing this form  <a href="http://www.nrc.gov/reading-rm/doc-collections/nureqs/staff/sr1022/r3/">http://www.nrc.gov/reading-rm/doc-collections/nureqs/staff/sr1022/r3/</a>)</p> </div> <div style="font-size: 0.8em;"> <p>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 Information Services Branch (T-2 F43), U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, or by 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.</p> </div> </div>											
<b>1. FACILITY NAME</b> Limerick Generating Station, Unit 1					<b>2. DOCKET NUMBER</b> 05000352		<b>3. PAGE</b> 1 OF 4				
<b>4. TITLE</b> D12 EDG Inoperable for Greater than 30 Days Resulting in Condition Prohibited by TS											
<b>5. EVENT DATE</b>			<b>6. LER NUMBER</b>			<b>7. REPORT DATE</b>			<b>8. OTHER FACILITIES INVOLVED</b>		
MONTH	DAY	YEAR	YEAR	SEQUENTIAL NUMBER	REV NO.	MONTH	DAY	YEAR	FACILITY NAME	DOCKET NUMBER	
12	07	17	2018	- 001	- 00	02	05	18	FACILITY NAME	DOCKET NUMBER	
<b>9. OPERATING MODE</b>		<b>11. THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check all that apply)</b>									
001		<input type="checkbox"/> 20.2201(b)			<input type="checkbox"/> 20.2203(a)(3)(i)			<input type="checkbox"/> 50.73(a)(2)(ii)(A)		<input type="checkbox"/> 50.73(a)(2)(viii)(A)	
		<input type="checkbox"/> 20.2201(d)			<input type="checkbox"/> 20.2203(a)(3)(ii)			<input type="checkbox"/> 50.73(a)(2)(ii)(B)		<input type="checkbox"/> 50.73(a)(2)(viii)(B)	
		<input type="checkbox"/> 20.2203(a)(1)			<input type="checkbox"/> 20.2203(a)(4)			<input type="checkbox"/> 50.73(a)(2)(iii)		<input type="checkbox"/> 50.73(a)(2)(ix)(A)	
		<input type="checkbox"/> 20.2203(a)(2)(i)			<input type="checkbox"/> 50.36(c)(1)(i)(A)			<input type="checkbox"/> 50.73(a)(2)(iv)(A)		<input type="checkbox"/> 50.73(a)(2)(x)	
100		<input type="checkbox"/> 20.2203(a)(2)(ii)			<input type="checkbox"/> 50.36(c)(1)(ii)(A)			<input type="checkbox"/> 50.73(a)(2)(v)(A)		<input type="checkbox"/> 73.71(a)(4)	
		<input type="checkbox"/> 20.2203(a)(2)(iii)			<input type="checkbox"/> 50.36(c)(2)			<input type="checkbox"/> 50.73(a)(2)(v)(B)		<input type="checkbox"/> 73.71(a)(5)	
		<input type="checkbox"/> 20.2203(a)(2)(iv)			<input type="checkbox"/> 50.46(a)(3)(ii)			<input type="checkbox"/> 50.73(a)(2)(v)(C)		<input type="checkbox"/> 73.77(a)(1)	
		<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)(D)		<input type="checkbox"/> 73.77(a)(2)(i)	
		<input type="checkbox"/> 20.2203(a)(2)(vi)			<input checked="" type="checkbox"/> 50.73(a)(2)(i)(B)			<input type="checkbox"/> 50.73(a)(2)(vii)		<input type="checkbox"/> 73.77(a)(2)(ii)	
					<input type="checkbox"/> 50.73(a)(2)(i)(C)			<input type="checkbox"/> OTHER Specify in Abstract below or in NRC Form 366A			
<b>12. LICENSEE CONTACT FOR THIS LER</b>											
<b>LICENSEE CONTACT</b> Robert B. Dickinson, Manager – Regulatory Assurance								<b>TELEPHONE NUMBER (Include Area Code)</b> (610) 718-3400			
<b>13. COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT</b>											
CAUSE	SYSTEM	COMPONENT	MANU-FACTURER	REPORTABLE TO EPIX	CAUSE	SYSTEM	COMPONENT	MANU-FACTURER	REPORTABLE TO EPIX		
B	EK	PCV	N174	Y	N/A	N/A	N/A	N/A	N/A		
<b>14. SUPPLEMENTAL REPORT EXPECTED</b> <input type="checkbox"/> YES (If yes, complete 15. EXPECTED SUBMISSION DATE) <input checked="" type="checkbox"/> NO					<b>15. EXPECTED SUBMISSION DATE</b>			MONTH	DAY	YEAR	
<b>ABSTRACT (Limit to 1400 spaces, i.e., approximately 15 single-spaced typewritten lines)</b> <p>On December 7, 2017, during performance of the D12 Emergency Diesel Generator (EDG) Surveillance Test (ST), it was recognized that Scavenging Air temperatures were abnormally high. An investigation revealed a deficiency in the air pressure control valve. Because of this deficiency, the Air Cooler Temperature Indicating Controller was not performing correctly. The D12 EDG had run unloaded for approximately two hours, then fully loaded for approximately one hour when the condition was identified. This condition results in inoperability/unavailability of the affected EDG and entry into a 30-day shutdown Limiting Condition for Operation (LCO). On December 12, 2017, the D12 EDG was declared operable and the LCO was exited.</p> <p>A past operability review determined that the D12 EDG was inoperable since the last D12 EDG 24-hr endurance run, which was began on November 6, 2017. The D12 EDG was inoperable for a period of greater than 30 days and the LCO 3.8.1.1.a actions were not completed in the required time frames provided in Technical Specifications (TS). Therefore, an Operation or Condition Prohibited by TS existed and is reportable under 10 CFR 50.73(a)(2)(i)(B).</p>											

**LICENSEE EVENT REPORT (LER)  
CONTINUATION SHEET**

(See NUREG-1022, R.3 for instruction and guidance for completing this form  
<http://www.nrc.gov/reading-rm/doc-collections/nuregs/staff/sr1022/r3/>)

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		YEAR	SEQUENTIAL NUMBER	REV NO.
Limerick Generating Station, Unit 1	05000352	2018	- 001	- 00

**NARRATIVE****I. Unit Conditions Prior to the Event**

Limerick Generating Station (LGS), Unit 1 was operating in Operational Condition (OPCON) 1 at 100 percent power at the time of the event. There were no other structures, systems, or components inoperable that contributed to the event.

**II. Description of the Event**

On December 7, 2017, during the performance of the D12 Emergency Diesel Generator (EDG) [EIS: EK] Loss of Coolant Accident (LOCA)/Load Reject Testing and Fast Start Operability Surveillance Test (ST) Run, it was recognized that Air Cooler Discharge Air temperatures were abnormally high (220°F), with an expected band of 115°F-145°F. The cooling water controller's setpoint was found set at 200°F. The required setpoint is 130°F. The D12 EDG had run unloaded for about two hours, then fully loaded for about one hour when the condition occurred. D12 EDG was declared inoperable and Limiting Condition for Operation (LCO) 3.8.1.1 was entered.

As part of troubleshooting, the Temperature Indicating Controller (TIC) was removed, bench tested satisfactorily, re-installed and recalibrated to a setpoint temperature of 130°F. On December 12, 2017, the D12 EDG was declared operable and the LCO was exited.

On December 11, 2017, a past operability review determined that the past functionality of the D12 EDG had been impacted since performance of the 24-hour endurance run that began on November 6, 2017, when an intermittent equipment deficiency caused incorrect indication and control resulting in subsequent high temperature conditions. Testing performed on January 10, 2018, during the monthly D12 EDG ST run, identified an equipment deficiency associated with the Pressure Control Valve (PCV). The air pressure control issue causes the TIC to not indicate or perform correctly.

The D12 EDG was inoperable for a period of greater than 30 days and the LCO 3.8.1.1.a actions were not completed in the required time frames provided in Technical Specifications (TS). Therefore, an Operation or Condition Prohibited by TS existed. This LER is being submitted in accordance with 10 CFR 50.73(a)(2)(i)(B).

**III. Analysis of the Event**

On November 6, 2017, while performing a routine running check of engine operation, an equipment operator identified that the air cooler temperature controller setpoint was not at 130°F and process temperatures were off-scale low (known condition with existing Issue Report (IR)). An adjustment was made to the temperature controller setpoint to control jacket water coolant engine discharge temperature, in accordance with procedure. However, intermittent malfunction of the PCV in the supply air line to the temperature controller would have prevented that adjustment from taking effect until the next engine run on December 7, 2017 (lower air pressure prevents the air cooler control loop from operating throughout its full span and results in a lower indicated setpoint and process temperature).

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**NARRATIVE****IV. Safety Significance**

The EDG and Auxiliary Systems are safety related standby emergency power systems and consist of four diesel generator sets per Unit. The operability of the A.C. power sources and associated distribution systems during operation ensures that sufficient power will be available to supply the safety-related equipment required for (1) the safe shutdown of the facility and (2) the mitigation and control of accident conditions within the facility. The TS action requirements specified for the levels of degradation of the power sources provide restriction upon continued facility operation commensurate with the level of degradation.

The D12 EDG was determined to be inoperable from November 6, 2017 to December 12, 2017; therefore, the TS 3.8.1.1.a action to restore the diesel within 30 days was not met. There were no safety consequences associated with the condition since there were no events during this time period which required the D12 EDG. The remaining LGS Unit 1 EDGs were only inoperable for their monthly surveillance tests during this period.

**V. Cause of the Event**

A root cause investigation is ongoing. The preliminary results of the investigation indicate that the proximate cause is due to intermittent operation of the temperature control loop PCV. The lower than normal air pressure coming from the PCV causes the temperature controller output to be less, which results in a temperature control valve position that directs more water through the heat exchanger. This, in turn, provides cooler water to the air coolers. The control loop feeds back air cooler air outlet temperature to the controller. Additionally, low air pressure to the controller will lower the value of the set point controller, which could result in an adjustment of the controller setpoint higher than necessary. A contributing cause is related to the procedure step that governs operator manipulation of this controller. Procedure S92.9.N, for performing routine running checks of engine operation, allows adjustment of the controller when setpoint temperature is low without considering potential control loop causes for incorrect controller setpoint.

**VI. Corrective Actions Completed/Planned**

The PCV on D12 EDG was replaced and sent to Exelon's Power Labs for further analysis. Changes have been made to the Operations procedure preventing manipulation of the temperature controller setpoint without prior shift supervision approval so that any control loop issues can be detected. Revisions will be made to the full/abbreviated run-in Routine Test (RT) prior to the respective EDG System Outage Windows (SOWs). A similar review was performed for I&C procedures that direct adjustment of the air cooler temperature controllers and no changes are required.

Additional corrective actions may be identified as part of the ongoing investigation. This LER will be revised if significant additional corrective actions are identified due to the ongoing investigation.

**VII. Previous Similar Occurrences**

There has been one other instance of high combustion air temperature conditions on the D12 EDG, in June 2017, following a D12 EDG SOW.

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**NARRATIVE**

While performing the post-SOW Fast Start, D12 experienced high air cooler outlet air temperatures. An investigation revealed that the Air Cooler Temperature Indicating Controller was found with the set point higher than expected. The Controller was replaced, the surveillance test was completed successfully and the D12 EDG was declared operable.

There have not been any instances of high combustion air temperature conditions on any of the other EDGs at LGS.

**VIII. Component data**

System: EK Emergency Onsite Power Supply System  
Component: PCV Pressure Control Valve  
Manufacturer: N174 NORGREN, CA CO  
Model Number: B72G-2AK-QD1-RFG