



Exelon Generation®

Oyster Creek  
Route 9 South  
P.O. Box 388  
Forked River, NJ 08731

10 CFR 50.73

RA-17-028

May 3, 2017

U.S. Nuclear Regulatory Commission  
Attn: Document Control Desk or O-8B1  
One White Flint North  
11555 Rockville Pike  
Rockville, MD 20852

Oyster Creek Nuclear Generating Station  
Renewed Facility Operating License No. DPR-16  
NRC Docket No. 50-219

Subject: Licensee Event Report (LER) 2017-001-01, "Automatic SCRAM due to APRM High Flux during Turbine Valve Testing"

Enclosed is LER 2017-001-01, "Automatic SCRAM due to APRM High Flux during Turbine Valve Testing"

This event did not affect the health and safety of the public or plant personnel. This event did not result in a safety system functional failure. There are no regulatory commitments made in this LER submittal.

Should you have any questions concerning this report, please contact Michael McKenna, Regulatory Assurance Manager, at (609) 971-4389.

Respectfully,

Michael F. Gillin  
Plant Manager  
Oyster Creek Nuclear Generating Station

Enclosure: NRC Form 366, LER 2017-001-01

cc: Administrator, NRC Region I  
NRC Senior Resident Inspector - Oyster Creek Nuclear Generating Station  
NRC Project Manager - Oyster Creek Nuclear Generating Station

JEZZ  
NRR



**LICENSEE EVENT REPORT (LER)**

(See Page 2 for required number of digits/characters for each block)

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

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.

<b>1. FACILITY NAME</b> Oyster Creek, Unit 1	<b>2. DOCKET NUMBER</b> 05000219	<b>3. PAGE</b> 1 OF 3
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**4. TITLE**  
Automatic SCRAM due to APRM High Flux during Turbine Valve Testing

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
11	20	16	2017	- 001	- 01	5	3	17	N/A	N/A
									N/A	N/A

**9. OPERATING MODE** N

**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)(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 checked="" type="checkbox"/> 50.73(a)(2)(iv)(A)	<input type="checkbox"/> 50.73(a)(2)(x)

**10. POWER LEVEL** 92%

<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 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

**12. LICENSEE CONTACT FOR THIS LER**

LICENSEE CONTACT Michael McKenna, Regulatory Assurance Manager	TELEPHONE NUMBER (Include Area Code) 609-917-4389
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**13. COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT**

CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO EPIX	CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO EPIX
X	TG	XC	G080						

**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)

On 11/20/2016 at approximately 0342 EST, an automatic reactor SCRAM occurred at 92% power due to Average Power Range Monitor (APRM) high flux. Oscillations of the turbine control valves and bypass valves were experienced during planned testing of the Turbine Master Trip Solenoid Valve at 95% power. Power was reduced from 95% to 92% by the Main Control Room Operators in an effort to stop the observed oscillations. The control valves did not respond properly during the power reduction, leading to an unexpected rise in reactor pressure and the subsequent scram on high flux.

There were no safety consequences impacting the plant or public safety as a result of this event. All control rods fully inserted and the plant response was as expected. This event is being reported pursuant to 10CFR50.73(a)(2)(iv)(A) due to an actuation of the Reactor Protection System (RPS).



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

(See NUREG-1022, R.3 for instruction and guidance for completing this form  
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1. FACILITY NAME	2. DOCKET NUMBER	3. LER NUMBER		
		YEAR	SEQUENTIAL NUMBER	REV NO.
Oyster Creek, Unit 1	05000219	2017	- 001	- 01

**NARRATIVE**

**Plant Conditions Prior To Event**

Event Date: November 20, 2016                      Event Time: 0342 EST  
Unit 1 Mode: Power Operation                      Power Level: 92%

**Description of Event**

On 11/20/2016, the Main Control Room (MCR) Operators were conducting quarterly Main Turbine surveillance testing. At 0326 EST, the MCR Operators commenced testing the Turbine Master Trip Solenoid Valve (MTS-3) at 95% reactor power in accordance with plant procedures. After actuating the Turbine Master Trip Solenoid Valve, the MCR Operators observed fluctuations in control valve and bypass valve position indication. The Control Room Operators also identified a transfer between the EPR and MPR and fluctuations in reactor pressure. Field Operators were dispatched to the turbine front standard to inspect for any abnormalities. The Field Operators reported vibration and high frequency oscillations of the control linkages contained in the front standard. In response to the field report, the MCR Operators commenced a controlled power reduction in an effort to arrest the oscillations.

At approximately 0342 EST, an automatic reactor SCRAM occurred at 92% power due to Average Power Range Monitor (APRM) high flux. The turbine control valves failed to properly control reactor pressure during the power reduction due to a malfunction of the Mechanical Hydraulic Control (MHC) System. After the plant scram, the vibration and oscillations at the front standard ceased, and the bypass valves responded to regulate reactor pressure. An inspection of the front standard and the turbine control valve hydraulic enclosure was performed following the plant shutdown. The inspection identified that the hydraulic feedback linkage for the number 2 turbine control valve had come disconnected and the fastener for the hydraulic feedback linkage on the number 4 control valve was loose due to the vibration that was experienced. The feedback linkage degradation resulted in the unexpected change in control valve position during the power reduction and the subsequent reactor scram.

**Cause of Event**

The root cause investigation determined that the performance of the Turbine Master Trip Solenoid Valve operability test with the plant at power challenged the stability of the MHC system due to unrecognized design vulnerability in the configuration of the hydraulic tubing. The hydraulic tubing for the Turbine Master Trip Solenoid Valve is routed to the bypass valve loading piston. The design function of the bypass valve loading piston is to dampen vibration on the control linkages contained in the front standard. During the Turbine Master Trip Solenoid Valve Operability Test, a pressure pulse is placed on the bypass pilot valve loading piston that can lead to an oscillation of the MHC system. The design vulnerability was unrecognized because the OEM drawings did not identify the function or location of the loading piston with respect to the location of the Master Trip Solenoid hydraulic supply.

The root cause investigation also determined that degradation of the bypass valve loading piston contributed to the oscillation of the MHC System.

**Analysis of Event**



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**NARRATIVE**

This issue resulted in an automatic reactor SCRAM. There were no equipment problems noted related to placing the reactor in a safe Cold Shutdown Condition.

There were no safety consequences impacting the plant or public safety as a result of this event. All control rods fully inserted and plant response was as expected. This event is being reported pursuant to 10CFR50.73(a)(2)(iv)(A) due to an actuation of the Reactor Protection System (RPS).

**Corrective Actions**

The following corrective actions were taken:

- The hydraulic linkage for the number 2 and number 4 control valves were repaired.
- The bypass valve loading piston was replaced.
- The turbine master trip solenoid valve test will no longer be performed online. The test will be performed during unit outage only.

**Previous Occurrences**

Oyster Creek Nuclear Generating Station experienced a similar event on December 14, 2013. During quarterly turbine valve testing with reactor power at 100% of rated thermal power, the plant experienced reactor pressure control abnormalities. The hydraulic feedback linkage for the number 2 and number 3 control valves failed, thereby requiring a scram. Operators initiated a manual reactor scram due to reactor pressure rising to 1042 psig which approached the automatic scram set point. That event was reported under LER 2013-004-00 in February 2014.

**Component Data**

Component	IEEE 805 System ID	IEEE 803A Component
Control Valve Hydraulic Enclosure	TG	XC