



Entergy Nuclear Operations, Inc.  
Pilgrim Nuclear Power Station  
600 Rocky Hill Road  
Plymouth, MA 02360

June 7, 2017

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

SUBJECT: Licensee Event Report 2017-005-00, 10 CFR 50, Appendix J, Option B, Leak Rate  
Criteria Exceeded

Pilgrim Nuclear Power Station  
Docket No. 50-293  
Renewed License No. DPR-35

LETTER NUMBER: 2.17.043

Dear Sir or Madam:

The enclosed Licensee Event Report 2017-005-00, 10 CFR 50, Appendix J, Option B, Leak Rate  
Criteria Exceeded, is submitted in accordance with Title 10 Code of Federal Regulations 50.73.

If you have any questions or require additional information, please contact me at (508) 830-8323.

There are no regulatory commitments contained in this letter.

Sincerely,

A handwritten signature in black ink, appearing to read "E. Perkins, Jr." followed by a flourish.

Everett P. Perkins, Jr.  
Manager, Regulatory Assurance

EPP/sc

Attachment: Licensee Event Report 2017-005-00, 10 CFR 50, Appendix J, Option B, Leak Rate  
Criteria Exceeded (3 pages)

IEZZ  
NRR

cc: Mr. Daniel H. Dorman  
Regional Administrator, Region I  
U.S. Nuclear Regulatory Commission  
2100 Renaissance Blvd., Suite 100  
King of Prussia, PA 19406-2713

Mr. John Lamb, Senior Project Manager  
Office of Nuclear Reactor Regulation  
U.S. Nuclear Regulatory Commission  
Mail Stop O-8C2A  
Washington, DC 20555

NRC Senior Resident Inspector  
Pilgrim Nuclear Power Station

**Attachment**

Letter Number 2.17.043

Licensee Event Report 2017-005-00

10 CFR 50, Appendix J, Option B, Leak Rate Criteria Exceeded

(3 Pages)



**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/nuregs/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> Pilgrim Nuclear Power Station	<b>2. DOCKET NUMBER</b> 05000293	<b>3. PAGE</b> 1 OF 3
--	-------------------------------------	--------------------------

**4. TITLE** 10 CFR 50, Appendix J, Option B, Leak Rate Criteria Exceeded

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
04	10	2017	2017	- 005	- 00	06	07	2017	N/A	05000 N/A
									FACILITY NAME	DOCKET NUMBER
									N/A	05000 N/A

<b>9. OPERATING MODE</b>  N	<b>11. THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §:</b> (Check all that apply)			
	<input type="checkbox"/> 20.2201(b)	<input type="checkbox"/> 20.2203(a)(3)(i)	<input checked="" 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)
<b>10. POWER LEVEL</b>  0	<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 checked="" 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 checked="" 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	

**12. LICENSEE CONTACT FOR THIS LER**

LICENSEE CONTACT Mr. Everett P. Perkins, Jr. - Regulatory Assurance Manager	TELEPHONE NUMBER (Include Area Code) (508) 830-8323
--	--

**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	JM	AL	C310	Y	X	JM	ISV	A391	Y

<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

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

On April 10, 2017, the Personnel Airlock, X-2, failed to meet local leak rate test acceptance criteria. This failure is reportable under 10 CFR 50.73(a)(2)(i)(B), any operation or condition which was prohibited by the plant's Technical Specifications.

On April 22, 2017, the High Pressure Coolant Injection System turbine exhaust line check valves both failed to meet local leak rate test acceptance criteria. The test volume for each valve could not be pressurized when flow was greater than 100 Standard Liters per Minute. Significant air flow was coming out of the test vent, indicating that each check valve was either degraded or not seated.

This failure resulted in the current Refueling Outage summation of Type B and Type C testing results exceeding the 10 CFR 50, Appendix J local leak rate test criteria limit of 0.6 L<sub>a</sub> and the primary containment total leakage criteria limit of 1.0 L<sub>a</sub>. This created an event that is reportable under 10 CFR 50.73(a)(2)(i)(B), any operation or condition which was prohibited by the plant's Technical Specifications, 10 CFR 50.73(a)(2)(ii)(A), any event or condition that resulted in the condition of the nuclear power plant, including its principal safety barriers, being seriously degraded, 10 CFR 50.73(a)(2)(v)(C), any condition that could have prevented the fulfillment of a safety function of a system needed to control the release of radioactive material, and 10 CFR 50.73(a)(2)(v)(D), any condition that could have prevented the fulfillment of a safety function of a system needed to mitigate the consequences of an accident.

There was no impact to public health and safety from this condition.



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

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](mailto: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.

(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/>)

1. FACILITY NAME	2. DOCKET NUMBER	3. LER NUMBER		
		YEAR	SEQUENTIAL NUMBER	REV NO.
Pilgrim Nuclear Power Station	05000-293	2017	- 005	- 00

**NARRATIVE**

**BACKGROUND**

The safety objective of the Primary Containment System is to provide the capability in conjunction with other safeguard features to limit the release of fission products in the event of a postulated design basis accident (DBA) so that offsite doses would not exceed the guideline values set forth in 10 Code of Federal Regulation (CFR) 100 and to prevent excessive fuel cladding temperatures.

**EVENT DESCRIPTION**

On April 10, 2017, the Personnel Airlock, X-2, failed to meet local leak rate test (LLRT) acceptance criteria of 0.05L<sub>a</sub> (10.25 Standard Liters per Minute (SLM)) during the as-found LLRT.

On April 22, 2017, the High Pressure Coolant Injection (HPCI) turbine exhaust line check valves, 2301-74 and 2301-45, both failed to meet LLRT acceptance criteria. The test volume for each valve could not be pressurized to test pressure when flow was greater than 100 SLM. Significant air flow was observed to be coming out of the test vent, indicating that each check valve was either degraded or not seated. The turbine exhaust line check valves must open during HPCI turbine operation. The valves also must close promptly upon reverse flow.

The HPCI check valves satisfied the leak rate test acceptance criteria in May 2015 during Refueling Outage (RFO) 20. Although unlikely that both valves failed shortly after RFO 20, without any data to determine the time of the failures, the primary containment function of Penetration X-223 was declared inoperable over the entire operating cycle between RFO 20 and RFO 21. Check valve leakage greater than 100 SLM results in exceeding the overall Technical Specification (TS) as-found minimum path Appendix J acceptance criteria (126.3 SLM).

During the current RFO, summation of Type B and Type C testing results exceeded the 10 CFR 50, Appendix J, LLRT criteria limit of 0.6 L<sub>a</sub> and the primary containment total leakage criteria limit of 1.0 L<sub>a</sub>.

Because of data collected during RFO 21 regarding Appendix J, LLRT, retrospectively two main steam isolation valves (MSIV) penetrations, X-7D Main Steam Line D pathway and X-7C Main Steam Line C pathway each exceeded their TS Leakage Limit during part of Operating Cycle 21 between May 2015 and December 2016. The leakage through the X-7C Pathway also exceeded the 1.0 L<sub>a</sub> leakage limit. The MSIV penetration leakage is being addressed in a supplement to LER 2016-010-00.

**CAUSE OF THE EVENTS**

The personnel airlock, X-2, failure was due to the displacement of the O-ring(s) on the inner pressure equalizing device (PED). The airlock PED O-ring(s) were replaced, correcting the leakage condition of the inner containment barrier. Once the PED O-ring(s) were replaced, the integrated airlock leak rate test was re-performed to verify the as-found outboard airlock barrier leakage results demonstrated that the primary containment personnel airlock was capable of performing the radioactive material barrier safety function.

The HPCI turbine exhaust line check valves both failed to meet LLRT acceptance criteria. The test volume could not be pressurized when flow was greater than 100 SLM. Subsequent disassembly and inspection showed that the inboard (2301-74) check valve was not fully seating in the closed position, and the outboard (2301-45) check valve had internal degradation that prevented the valve disk from closing properly.



**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/>)

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](mailto: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. DOCKET NUMBER	3. LER NUMBER		
		YEAR	SEQUENTIAL NUMBER	REV NO.
Pilgrim Nuclear Power Station	05000-293	2017	- 005	- 00

**CORRECTIVE ACTIONS**

The HPCI turbine exhaust check valves, the MSIVs, and the containment personnel airlock PED were all repaired and subsequently retested, declared Operable and returned to service.

**SAFETY CONSEQUENCES**

The actual consequences of the two HPCI turbine exhaust check valves were a primary containment loss of safety function. Since two of the four inboard MSIVs failed their respective LLRTs, then, it is assumed that at least some time during Operating Cycle 21 there may have been a pathway from primary containment via two of the main steam lines, into secondary containment (the main stream line tunnel area) whose atmosphere is filtered through Standby Gas Treatment. The personnel airlock interior boundary failed but the exterior boundary was intact to perform the safety function. No actions to reduce the frequency or consequence are necessary.

**REPORTABILITY**

During the current RFO, summation of Type B and Type C testing results exceeded the 10 CFR 50, Appendix J, LLRT criteria limit of 0.6 L<sub>a</sub> and the primary containment total leakage criteria limit of 1.0 L<sub>a</sub>. This created an event that is reportable under 10 CFR 50.73(a)(2)(i)(B), any operation or condition which was prohibited by the plant's Technical Specifications and 10 CFR 50.73(a)(2)(ii)(A), any event or condition that resulted in the condition of the nuclear power plant, including its principal safety barriers, being seriously degraded, as well as 10 CFR 50.73(a)(2)(v)(C), any condition that could have prevented the fulfillment of a safety function of a system needed to control the release of radioactive material, and 10 CFR 50.73(a)(2)(v)(D), any condition that could have prevented the fulfillment of a safety function of a system needed to mitigate the consequences of an accident.

This submittal also addresses the personnel airlock which did not meet its local leak rate test leakage acceptance criteria limit of 0.05L<sub>a</sub>. This also created a situation that is reportable under 10 CFR 50.73(a)(2)(i)(B), any condition which was prohibited by the plant's TS.

**PREVIOUS EVENTS**

A review of Pilgrim Nuclear Power Station LERs for the last 10 years did not find a similar event as described in this LER. However, there was a previous personnel airlock PED failure in 2013 as reported in CR-PNP-2013-2276.

**REFERENCES:**

- CR-PNP-2017-3184
- CR PNP-2017-4047
- CR PNP-2017-4048
- CR-PNP-2017-3531
- CR-PNP-2017-3588
- CR-PNP-2017-5075