



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

June 14, 2017

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

SUBJECT: Licensee Event Report, 2016-010-01, MSIV Inoperability

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

LETTER NUMBER: 2.17.045

Dear Sir or Madam:

The enclosed Licensee Event Report (LER) 2016-010-01, MSIV Inoperability, is submitted in accordance with Title 10 Code of Federal Regulations 50.73. Revisions to the previously submitted LER will be annotated by a vertical bar to the right of the wording changes.

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 "Everett P. Perkins, Jr.", with a stylized flourish at the end.

Everett P. Perkins, Jr.
Manager, Regulatory Assurance

EPP/sc

Attachment: Licensee Event Report 2016-010-01, MSIV Inoperability (4 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 2.17.045

Licensee Event Report 2016-010-01

MSIV Inoperability

(4 Pages)



LICENSEE EVENT REPORT (LER)

(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 Pilgrim Nuclear Power Station (PNPS)	2. DOCKET NUMBER 05000293	3. PAGE 1 OF 4
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4. TITLE MSIV Inoperability

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	15	2017	2016	- 010	- 01	06	14	2017	N/A	N/A
									FACILITY NAME	DOCKET NUMBER
									N/A	N/A

9. OPERATING MODE	11. THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check all that apply)			
N	<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)
10. POWER LEVEL 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)(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

LICENSEE CONTACT Mr. Everett P. Perkins, Jr. - Regulatory Assurance Manager	TELEPHONE NUMBER (Include Area Code) 508-830-8323
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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	SB	ISV	A585	Y					

14. SUPPLEMENTAL REPORT EXPECTED <input type="checkbox"/> YES (If yes, complete 15. EXPECTED SUBMISSION DATE) <input checked="" type="checkbox"/> NO	15. EXPECTED SUBMISSION DATE	MONTH	DAY	YEAR

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

On December 15, 2016, at 1500 [EST], with the reactor at approximately 22 percent power, the Main Steam Isolation Valves (MSIVs) 2C and 2D were discovered to have steam leaks while performing a steam tunnel walkdown. MSIV 2D, which had a body to bonnet steam leak, was declared inoperable and Technical Specifications (TS) Limiting Condition for Operation Action Statement (LCOAS) 3.7.A.2.b was entered at 1530 on December 15, 2016. Outboard MSIV 2D and inboard MSIV 1D both were closed and deactivated to isolate Main Steam Line D. On December 16, 2016, at 1524 [EST] Operations entered TS LCOAS 3.7.A.2.b for a packing steam leak on outboard MSIV 2C. Actions were also taken to close and deactivate the inboard MSIV 1C, which included a controlled plant shutdown to reduce reactor pressure below the MSIV closure scram bypass setpoint.

On April 15, 2017, during Refueling Outage 21(RFO 21), MSIV 1D failed it's Local Leak Rate Test (LLRT). In addition, the MSIV 1C also failed its LLRT. As a result it was concluded that MSIV 1D and MSIV 1C exceeded their leakage criteria during RFO21. Therefore, Pilgrim Nuclear Power Station is making this submittal to provide the NRC with additional information regarding the condition of the plant's MSIV's.

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 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.

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BACKGROUND

The function of the Main Steam Isolation Valves (MSIVs) is to prevent reactor coolant inventory loss in the event of a steam line break outside primary containment. Also, MSIVs provide a primary containment boundary after a loss of coolant accident inside primary containment. The MSIVs are 20-inch air/spring operated, balanced "Y"-type globe valves. There are four main steam lines. Each steam line has two MSIVs; one inside primary containment and one outside of primary containment. The MSIV outboard valves are located inside the steam tunnel in secondary containment.

The MSIVs are part of the primary containment isolation system (PCIS) which provides timely protection against the gross release of radioactive materials from the fuel, nuclear system process barrier, and from the primary containment. The PCIS automatically initiates whenever monitored variables exceed preselected operational limits. Immediate shutdown of the reactor is appropriate in such a situation. The scram initiated by the MSIV closure anticipates a reactor vessel low water level scram. The main steam line isolation scram setting is selected to give the earliest positive indication of isolation valve closure.

EVENT DESCRIPTION

On December 15, 2016, at 1500 [EST], with the reactor at approximately 22 percent power, while performing a steam tunnel walkdown the MSIVs 2C (AO-203-2C) and 2D (AO-203-2D) were discovered to have steam leaks. MSIV 2D, had a valve body to bonnet steam leak, and MSIV 2C had a valve packing leak.

After the body to bonnet seal weld on MSIV 2D, a post-maintenance test of the valve was completed to check for valve stem leakage. The testing method pressurized main steam pipeline 'D' between the respective inboard and outboard MSIVs. A leak rate test cart was used to pressurize the pipeline with air to perform a soap bubble leak check of the flange. The plant operator who used the leak rate test cart for this purpose related that the total boundary leakage between MSIV 2D and MSIV 1D was sufficiently low such that the leak rate test cart's limited air delivery rate easily pressurized the pipe line between the inboard and outboard MSIVs (demonstrating no evidence of gross seat leakage through MSIV 1D). Therefore, it was reasonable (and within the PNPS licensing basis) to assume the leakage rate through MSIV 1D was consistent with its RFO 20 as-left Local Leak Rate Test (LLRT) leakage rate for purpose of determining the past operability of penetration X-7D (i.e., Appendix J minimum path leakage limit for penetration X-7D was met).

After the packing on MSIV 2C was partially replaced, a post-maintenance test of the valve was completed to check for valve stem leakage. The testing method pressurized main steam pipeline 'C' between the respective inboard and outboard MSIVs. A leak rate test cart was used to pressurize the pipeline with air to perform a soap bubble leak check of the flange. The plant operator who used the leak rate test cart for this purpose related that the total boundary leakage between MSIV 2C and MSIV 1C was sufficiently low such that the leak rate test cart's limited air delivery rate easily pressurized the pipe line between the inboard and outboard MSIVs (demonstrating no evidence of gross seat leakage through MSIV 1C). Therefore, it was reasonable (and within the PNPS licensing basis) to assume the leakage rate through MSIV 1C was consistent with its RFO 20 as-left LLRT leakage rate for purpose of determining the past operability of penetration X-7C (i.e., Appendix J minimum path leakage limit for penetration X-7C was met).

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On April 15, 2017, during Refueling Outage 21(RFO 21), both the inboard MSIV 1D and the inboard MSIV 1C failed their respective LLRT. This was discussed in LER 2017-005-00, 10 CFR 50, Appendix J, Option B, Leak Rate Criteria Exceeded.

SAFETY CONSEQUENCES

There were no consequences to the safety of the public, nuclear safety, industrial safety or radiological safety due to this event. Main Steam Line D was isolated on December 15, 2016, in accordance with Technical Specifications (TS) requirements. The MSIV 2D valve body to bonnet flange leak would have created a pathway for release of radioactive material from primary containment. However, the steam leakage from the body to bonnet flange of the outboard MSIV 2D would not have left the secondary containment barrier and would have been processed by standby gas treatment system.

Main Steam Line C was isolated on December 17, 2016, also in accordance with TS requirements. In addition, on December 17, 2016 the plant was shut down and the two outboard MSIVs were repaired and returned to service. The MSIV 2C valve packing leak with the MSIV 1C valve seat leakage would have compromised the MSIV capability to limit the release of radioactive material from primary containment. However, the steam leakage from the packing leak of the outboard MSIV 2C would not have left secondary containment barrier and would have been processed by standby gas treatment system.

No actions to reduce the frequency or consequence are necessary.

CAUSE OF THE EVENT

The cause of the MSIV 2D leakage in December 2016 was that the gasket used in the valve body to bonnet interface was out of specification; resulting in excessive valve body to bonnet gap.

The cause of the RFO 21 MSIV 1D exceeding its leak rate test criteria limits was because the internal guide rib wear had caused seat damage to the valve.

The cause of the MSIV 2C valve packing leakage in December 2016 was worn packing from scoring on the valve stem. The valve stem was polished to remove obtrusions for a smoother finish.

The cause of the RFO 21 MSIV 1C exceeding its leak rate test criteria limits was because of pilot poppet wear at the stem connection.

In addition, a possible contributing cause during RFO 21 was that the MSIV's were closed at a different time than they normally would have been during most RFOs. Because of extenuating plant conditions the MSIV's were kept open approximately an additional 24 hours. This created a situation where the MSIV's were not closed using steam pressure to close the disk into the seat. Instead the valves were in a cold condition when closed. Normally the valves would have been in a hot condition which could obtain better seating.

CORRECTIVE ACTIONS

The immediate corrective action to reduce the probability of similar events occurring in the future, in December, 2016, was to seal weld the MSIV 2D valve body to bonnet flange to prevent future leaks. The MSIV 2D then had Post Work Tested (PWT) performed, and the valve was returned to service.

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The corrective action to reduce the probability of similar events occurring in the future, for the inboard MSIV 1D, during RFO 21, was to disassemble and repair the valve body, replace internal parts and perform PWT and return the valve to service.

The immediate corrective action to reduce the probability of similar events occurring in the future, in December, 2016, was to partially replace the outboard MSIV 2C valve packing and polish the valve stem.

The corrective action to reduce the probability of similar events occurring in the future, for the outboard MSIV 2C, during RFO21, was to replace the valve stem, inspect the valve, make needed repairs, replace the packing, perform PWT on the valve and return it to service.

The immediate corrective action to reduce the probability of similar events occurring in the future, for the inboard MSIV 1C during RFO 21 was to rebuild the valve, perform PWT on the valve and return it to service.

REPORTABILITY

Pilgrim Nuclear Power Station is making this submittal to provide the NRC with additional information regarding the condition of the plant's MSIV's.

PREVIOUS EVENTS

A review of Pilgrim Nuclear Power Station Licensee Event Reports for the past five years only identified LER 2016-010-00, MSIV Inoperability Led To Condition Prohibited By The Plants TS, which was the predecessor to this supplemental submittal.

REFERENCES:

- CR-PNP-2016-10039
- CR-PNP-2016-10040
- CR-PNP-2017-03531
- CR-PNP-2017-03588
- CR-PNP-2017-05075