



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

July 11, 2016

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

SUBJECT: Licensee Event Report 2016-004-00, Salt Service Water Pump B Past Operability –
Operation or Condition Prohibited by Technical Specifications

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

LETTER NUMBER: 2.16.038

Dear Sir or Madam:

The enclosed Licensee Event Report 2016-004-00, Salt Service Water Pump B Past Operability –
Operation or Condition Prohibited by Technical Specifications, is submitted in accordance with 10
Code of Federal Regulation 50.73.

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

There are no regulatory commitments contained in this letter.

Sincerely,

A handwritten signature in black ink that reads "Everett P. Perkins, Jr." with a stylized flourish at the end.

Everett P. Perkins, Jr.
Manager, Regulatory Assurance

EPP/fxm

Attachment: Licensee Event Report 2016-004-00, Salt Service Water Pump B Past Operability –
Operation or Condition Prohibited by Technical Specifications

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

Ms. Booma Venkataraman, 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 2.16.038

Licensee Event Report 2016-004-00

Salt Service Water Pump B Past Operability – Operation or Condition Prohibited by Technical Specifications

(5 Pages)



LICENSEE EVENT REPORT (LER)

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 Infocollections.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	2. DOCKET NUMBER 05000293	3. PAGE 1 OF 5
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4. TITLE
Salt Service Water Pump B Past Operability – Operation or Condition Prohibited by Technical Specifications

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
05	12	2016	2016	004	00	07	11	2016	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)(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"/> 73.71(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
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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
D	ED	59	E059	Y					

14. SUPPLEMENTAL REPORT EXPECTED	15. EXPECTED SUBMISSION DATE	MONTH	DAY	YEAR
<input checked="" type="checkbox"/> YES (If yes, complete 15. EXPECTED SUBMISSION DATE) <input type="checkbox"/> NO		09	09	16


ABSTRACT

On May 10, 2016 with the reactor at 100% power and the mode switch in RUN; a condition report was written to evaluate past operability of the Salt Service Water (SSW) Pump P-208B power supply breaker overload relay based on thermography results obtained on October 25, 2013. A similar high temperature condition was identified during the February 29, 2016 thermography surveillance that resulted in declaring the pump inoperable on March 4, 2016 and completing the replacement of the overload relay on March 5, 2016. SSW Pump P-208B is currently operable.

The past operability review covers the period of time between the 2013 thermography surveillance and March 5, 2016 when the pump breaker overload relay was replaced. Based on the lack of detailed information in the 2013 surveillance, past operability of the pump could not be assured. A review of out-of-service time for SSW Pumps P208A and P208C indicates that one instance occurred where less than two SSW pumps were Operable to feed the SSW A Loop Header for a period in excess of SSW Technical Specification requirements. This represents a reportable condition.

The cause of the overload relay high temperature readings was evaluated and determined to be a high resistance connection on the overload relay heater assembly. Inadequate predictive maintenance monitoring was identified as the apparent cause for not periodically assessing breaker status or replacing the breaker overload relay prior to March 5, 2016. Testing the overload relay that was removed from service is planned. This testing is expected to be completed by August 15, 2016. Results will be reported in a supplement to this report.

There was no impact to public health and safety.

NRC FORM 366 (11-2015)		U.S. NUCLEAR REGULATORY COMMISSION		APPROVED BY OMB: NO. 3150-0104		EXPIRES: 10/31/2018	
 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.					
		1. FACILITY NAME		2. DOCKET NUMBER		3. LER NUMBER	
Pilgrim Nuclear Power Station		05000293		YEAR	SEQUENTIAL NUMBER	REV NO.	
				2016	004	00	

NARRATIVE

BACKGROUND

The safety objective of the SSW system is to provide a heat sink for the Reactor Building Closed Cooling Water (RBCCW) system under normal, transient, and accident conditions. The SSW system has five SSW pumps and is designed with sufficient redundancy so that no single active system component failure can prevent the system from achieving the safety objective. The system is designed to continuously provide a supply of cooling water to the secondary side of the RBCCW heat exchangers adequate to meet the requirements of the RBCCW system under all conditions. The RBCCW system provides the necessary cooling requirements for the residual heat removal (RHR) system and ultimately the reactor and primary containment.

The SSW pumps are separated into two loops. Two pumps are connected to each loop and the fifth pump can feed either loop. Initiation of standby AC power following loss of the preferred AC power source will automatically start at least one pump in each loop during normal conditions. Following a Loss of Coolant Accident (LOCA) and loss-of-offsite power, one pump will start in each loop because of diesel load limitations. Additional pumps are started manually by the operator as additional cooling loads are established and diesel capacity is available.

Technical Specification (TS) Limiting Condition For Operation (LCO) 3.5.B.4 requires two SSW loops to be operable whenever fuel is in the vessel and reactor coolant temperature is greater than 212 degrees F. Operability of each loop requires at least two SSW pumps to be operable in the loop along with the associated controls to demonstrate SSW loop operability.


Thermography is part of the SSW pump breaker predictive maintenance program. SSW system TS surveillances do not require use of thermography to determine system or pump operability. The site thermography procedure requires condition reports to be written if high temperature conditions exist.

EVENT DESCRIPTION

On May 10, 2016, Condition Report CR-PNP-2016-3308 was written to perform a past operability review on the SSW Pump P-208B power supply breaker overload relay based on thermography surveillance results obtained on October 25, 2013.

The 2013 thermography surveillance indicated the breaker was in the Level II - Warning Range (a temperature rise of greater than 25 degrees F and less than 50 degrees F for 480 Volt equipment). Procedure instruction for 480 Volt breakers is to take action recommended by the Preventative Maintenance Team. Condition Report CR-PNP-2013-7196 was issued and the pump was identified as operable. No follow-up maintenance work was performed to address the potential high temperature condition. Work Order (WO) 366187 to replace the overload relay was created on October 28, 2013 but not worked until after the SSW pump was declared inoperable in March 2016.

SSW Pump P208B TS operability surveillances during the 2013 to 2016 time frame were performed with acceptable results. No actions were taken or believed necessary to replace the overload relay to demonstrate TS operability.

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NARRATIVE

The February 29, 2016 thermography surveillance indicated high temperature in the breaker overload relay area. The high temperature readings met the procedure criteria for Level II - Warning and Preventative Maintenance Team action recommendation. A subsequent review and follow-up evaluation by engineering resulted in a delayed declaration of SSW Pump P208B inoperability on March 4, 2016 due to the high temperature readings, pump current readings, and conservative consideration for potential low voltage accident conditions. The pump overload relay was replaced via WO 366187 on March 5, 2016 and the SSW pump was restored to Operable status.

TS LCO Action Statement (AS) 3.5.B.4.A allows continued reactor operation with one inoperable SSW subsystem (loop) provided the SSW subsystem is restored to OPERABLE status within 72 hours (allowed restoration time). If the SSW subsystem is not restored to OPERABLE status within 72 hours, the TS LCO AS requires the reactor to be in Cold Shutdown within 24 hours (shutdown completion time).


Based on the assumption that SSW Pump P-208B was inoperable from the time that the high temperature was noted on October 25, 2013 until the pump was declared operable on March 5, 2016, a review of all the other SSW pumps operability status was performed. One instance of the SSW subsystem (loop) A being inoperable for a time period that exceeded the combined allowed restoration time and shutdown completion time of 96 hours was identified. This occurred from 1947 hours on November 8, 2015 to 1644 hours on November 18, 2015 for a total of 236.95 hours. Continuing to operate for a duration exceeding 96 hours with the SSW loop A inoperable resulted in operation prohibited by the TS.

CAUSE OF THE EVENT

The cause of the SSW Pump P-208B overload relay high temperature readings was evaluated and determined to be a high resistance connection on the overload relay heater assembly. Inadequate predictive maintenance monitoring was identified as the apparent cause for not periodically assessing the breaker status and replacing the breaker overload relay prior to March 5, 2016.

Review of the work orders that performed thermography on the SSW pumps found that the SSW Pump P-208B breaker (52M-1544) had not had a thermography image taken for almost three years, even though the required periodicity for thermography performance on the breaker is every six months. Procedure 3.M.3-60 "Infrared Thermography" allows not performing the thermography on a component if the component is not running.

The Work Order (WO) 366187 to replace the overload relay was created on October 28, 2013 but not worked until after the SSW pump was declared inoperable in March 2016. WO 366187 was given a work priority of 3D. The guidance for scheduling a WO with work priority of 3D is to – Schedule at next available system / component outage within the Cycle Plan or based on Modification scheduled. Contrary to the scheduling guidance, the WO was not worked until after SSW Pump P-208B was declared inoperable.

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NARRATIVE**CORRECTIVE ACTIONS**

Corrective action was taken to replace the installed breaker overload relay to restore SSW Pump B Operability. The breaker overload relay installed during the 2013 to 2016 timeframe was an Eaton Corp (formerly Cutler-Hammer; EIS Code = T020), Type A, Cat Number - FH93 relay (EIS Code = 59).

Additional corrective actions are captured in the corrective action program in Condition Reports CR-PNP-2016-01546, - 2057, and -02061.

SAFETY CONSEQUENCES

The safety objective of the SSW system is to provide a heat sink for the reactor building closed cooling water (RBCCW) system under normal, transient, and accident conditions. The SSW system has five (5) SSW pumps and is designed with sufficient redundancy so that no single active system component failure can prevent the system from achieving the safety objective. The system is designed to continuously provide a supply of cooling water to the secondary side of the RBCCW heat exchangers adequate to meet the requirements of the RBCCW system under all conditions. The RBCCW system provides the necessary cooling requirements for the residual heat removal (RHR) system and ultimately the reactor and primary containment.

The SSW pumps are separated into two loops. Two pumps are connected to each loop and the fifth pump can feed either loop. Initiation of standby AC power following loss of the preferred AC power source will automatically start at least one pump in each loop during normal conditions. Following a LOCA and loss-of-offsite power one pump will start in each loop because of diesel load limitations. Additional pumps are started manually by the operator as additional cooling loads are established and diesel capacity is available.


Technical Specifications require two SSW loops to be operable whenever fuel is in the vessel and reactor coolant temperature is greater than 212 degrees F. Operability of each loop requires at least two SSW pumps to be operable in the loop along with the associated controls to demonstrate SSW loop operability.

Only one SSW loop is required to perform the safety functions. Since SSW Loop B was operable during this time period, no loss of safety function occurred.

There was no adverse impact on the public health or safety.

REPORTABILITY

This report is submitted in accordance with 10 CFR 50.73(a)(2)(i)(B), Operation or condition prohibited by Technical Specifications.

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		2016	004	00

NARRATIVE

PREVIOUS EVENTS

LERs for the previous ten years were reviewed for SSW Pumps being inoperable. These LERs are summarized as follows:

- LER 2013-007 – Ultimate Heat Sink and Salt Service Water System Declared Inoperable
- LER 1998-029 – Intake Structure Indoor Air Temperature Less Than Design
- LER 1997-017-01 – Past Operation With Service Water Temperatures Greater Than Design Due To Licensing Basis Ambiguity
- LER 1997-015-01 – SSW Pumps Overload Settings Too Low for Single SSW Pump Operation with Degraded Voltage

These prior LERs involved events where SSW Pumps were declared inoperable at the same time. However, the events are different because they did not involve inadequate predictive maintenance monitoring.

ENERGY INDUSTRY IDENTIFICATION SYSTEM (EIIS) CODES

The EIIS codes for Components and Systems referenced in this report are as follows:

COMPONENTS	CODES
Relay - Overvoltage	59

SYSTEMS	CODES
Low Voltage Power System Class 1E	ED

REFERENCES:

- Condition Report CR-PNP-2016-01546 – 52M-1544 (SSW Pump B) thermal image hot spots
- Condition Report CR-PNP-2016-03308 – Comparison of 2016 to 2013 thermography surveillance results for SSW Pump B, Bkr 1544 overload relay for Past Operability
- Condition Report CR-PNP-2013-07196 – Thermography surveillance results on SSW Pump motor supply breakers
- Condition Report CR-PNP-2016-02057 – Work Management Problem Area
- Condition Report CR-PNP-2016-02061 – Engineering Programs Problem Area