



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

November 2, 2017

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

SUBJECT: Licensee Event Report 2017-008-01, Supplement to 480V Bus B6 Auto Transfer
Function Degraded Due to Time Delay Relay Failure

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

LETTER NUMBER: 2.17.068

Dear Sir or Madam:

The enclosed Licensee Event Report 2017-008-01, Supplement to 480V Bus B6 Auto Transfer
Function Degraded Due to Time Delay Relay Failure, is submitted in accordance with Title 10 Code
of Federal Regulations 50.73. Revisions to the previously submitted LER are 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 2017-008-01, Supplement to 480V Bus B6 Auto Transfer
Function Degraded Due to Time Delay Relay Failure (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

USNRC Senior Resident Inspector
Pilgrim Nuclear Power Station

Attachment

Letter Number 2.17.068

Licensee Event Report 2017-008-01

Supplement to 480V Bus B6 Auto Transfer Function Degraded Due to Time Delay Relay Failure

(4 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.

1. FACILITY NAME Pilgrim Nuclear Power Station	2. DOCKET NUMBER 05000-293	3. PAGE 1 OF 4
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4. TITLE Supplement to 480V Bus B6 Auto Transfer Function Degraded Due to Time Delay Relay Failure

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	03	2017	2017	- 008	- 01	11	02	2017	N/A	N/A
									FACILITY NAME	DOCKET NUMBER
									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 type="checkbox"/> 50.73(a)(2)(iv)(A)	<input type="checkbox"/> 50.73(a)(2)(x)
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)(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 checked="" 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
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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	ED	2	A109	N					

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

On May 3, 2017 with the unit shutdown for refueling outage, while performing plant procedure 3.M.3-27, "480V Bus B6 Transfer Test, UV, Degraded Voltage and Timing Relays Calibration and Annunciator Verification," the time delay Agastat relay 27A-B1X/TDDO opened instantaneously, instead of with a time delay. This relay is set to drop out after a 1.25 second time delay after being de-energized. This condition was discovered during the plant's refueling outage when conditions were such that the equipment normally energized/activated by this time delay relay was not required to be operable.

Pilgrim Nuclear Power Station is submitting this Licensee Event Report in accordance with 10 CFR 50.73(a)(2)(i)(B) – Operation or condition prohibited by Technical Specifications; and in accordance with 10 CFR 50.73(a)(2)(v)(B), (C) and (D) – Any condition that could have prevented the fulfillment of the safety function of structures or systems that are needed to remove residual heat, control the release of radioactive material and mitigate the consequences of an accident.

This event was not risk significant. There was no threat to public health and safety from this condition.



**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.
Pilgrim Nuclear Power Station	05000-293	2017	- 008	- 01

NARRATIVE

BACKGROUND

Bus B6 supplies 480V vital power to the low pressure coolant injection (LPCI) valves that open to facilitate LPCI injection flow into the recirculation piping during the plant response to a postulated design basis event. Power to Bus B6 is normally fed from Bus B1 (train A). Bus B2 (train B) is the back-up power feed to Bus B6. Bus B6 is designed to automatically transfer power to the opposite train power feed in the event of loss of power or degraded voltage on the feed providing power to Bus B6.

EVENT DESCRIPTION

On May 3, 2017 with the unit shutdown for refueling outage, while performing plant procedure 3.M.3-27, "480V Bus B6 Transfer Test, UV, Degraded Voltage and Timing Relays Calibration and Annunciator Verification," the time delay Agastat relay 27A-B1X/TDDO opened instantaneously, instead of with a time delay. This relay is set to drop out after a 1.25 second time delay after being de-energized. This condition was discovered during the plants refueling outage when conditions were such that the equipment normally energized/activated by this time delay relay was not required to be operable.

The 27A-B1X/TDDO relay is used only in the degraded voltage scheme and works in conjunction with relay 27-B1X/TDE. The 27A-B1X/TDDO relay picks up instantly when relays 27A-B1/1 and 27A-B1/2 sense a degraded voltage condition. Contact 3/5 of relay 27A-B1X/TDDO closes instantly energizing relay 27-B1X/TDE. The 27-B1X/TDE relay contact closes on a 1 second delay, then trips breaker 52-601 and closes breaker 52-602. The time delay of the 27A-B1X/TDDO relay keeps the degraded voltage relay trip on the 27-B1X/TDE relay for 1.25 seconds, to ensure relay 27-B1X/TDE remains energized and performs the portion of the bus transfer in which 52-601 opens and 52-602 closes.

This transfer between breakers 52-601 and 52-602 works synchronously with the transfer between breakers 52-102 and 52-202. The complementary relay (27A-B1Z) in this portion of the transfer logic also stays energized for 1.25 seconds on a momentary degraded voltage condition causing breakers 52-102 and 52-202 to transfer.

In this particular case, there was the potential that if relay 27A-B1X TDDO dropped out instantly on a degraded voltage condition, but the degraded voltage condition then cleared during the 1.00 second time delay to energize (TDE) for 27-B1X TDE (such that it does not energize), then breaker 52-601 would remain closed and 52-602 would remain open (i.e., no bus transfer to B2). At the same time, the complementary bus B1 breaker 52-102 relay 27A-B1Z, holding energized during the 1.25 seconds that the bus B1 degraded voltage clears, would allow that portion of the transfer scheme to operate correctly, and breaker 52-102 would open and 52-202 would close. This set of conditions would have left bus B6 De-Energized with both bus B1 and bus B2 back to normal voltage.



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NARRATIVE

Thus, with contact 3/5 of relay 27A-B1X TDDO opening instantaneously instead of with a 1.25 second time delay, this portion of the transfer scheme to transfer bus B6 to bus B2 with bus B1 powering B6, for a temporary degraded voltage on bus B1, was inoperable. For any other condition of degraded voltage on bus B1 (that did not clear during the transfer), or for a significant or total loss of Bus B1 voltage, the transfer scheme to bus B2 would have functioned normally.

In addition, the ability to perform a manually controlled operation to transfer bus B6 from B1 to bus B2 under these degraded voltage conditions was available per PNPS Procedure 2.4.B.6 "Loss of bus B6". This transfer would re-power the LPCI injection valves from either bus B1 or B2 as needed.

CAUSE OF THE EVENT

The offsite vendor concluded after examinations and analysis of the time delay relay 27A-B1X/TDDO that the latch spring has an intermediate position. During energizing, the latch spring goes to the intermediate position and causes the diaphragm plunger to not fully pick up and the air system is not fully charged. Therefore, at de-energization, it requires less time for the diaphragm plunger to pull the latch spring from the intermediate position back to the normally open position; thus creating less time delay as observed in plant testing.

CORRECTIVE ACTIONS

The Agastat time delay relay 27A-B1X/TDDO was replaced, restoring the degraded voltage protection functionality for the condition where bus B6 is being powered by bus B1.

SAFETY CONSEQUENCES

This Agastat time delay relay 27A-B1X/TDDO was installed during PNPS Refueling Outage 20 and therefore had only been installed for one cycle. This condition was discovered during the refueling outage when conditions were such that the equipment normally energized/activated by this time delay relay were not required to be operable, however based on the offsite vendor examinations and analysis this condition most likely existed during PNPS Cycle 21.

If during plant operation a bus B1 degraded voltage condition had occurred, manual actions could have been taken to transfer bus B6 from bus B1 to bus B2 per procedure PNPS 2.4.B.6, "Loss of bus B6." This transfer would re-power the LPCI injection valves and provide power to other primary containment isolation valves.

There are no consequences to the general safety of the public, nuclear safety, industrial safety and radiological safety from this event.



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REPORTABILITY

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PREVIOUS EVENTS

A review of PNPS LERs for the past five years identified LER 2015-004-00 “480V Bus B6 Auto Transfer Function Degraded” also documented a failure of relay 27A-B1X/TDDO. In the 2015 failure, the relay contact 3/5 never closed to initiate the transfer logic to trip open breaker 52-601 and close breaker 52-602.

REFERENCES:

CR-PNP-2017-4768

CR-PNP-2015-3454