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

June 30, 2017

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

SUBJECT: Licensee Event Report 2017-008-00, 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: 2.17.048

Dear Sir or Madam:

The enclosed Licensee Event Report 2017-008-00, 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.

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,

Everett P. Perkins, Jr.
Manager, Regulatory Assurance

EPP/sc

Attachment: Licensee Event Report 2017-008-00, 480V Bus B6 Auto Transfer Function Degraded Due to Time Delay Relay Failure (4 pages)

IE22
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 2.17.048

Licensee Event Report 2017-008-00

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

(4 Pages)

NRC FORM 366 (04-2017) U.S. NUCLEAR REGULATORY COMMISSION

APPROVED BY OMB: NO. 3150-0104 EXPIRES: 03/31/2020

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/)

1. FACILITY NAME	2. DOCKET NUMBER	3. PAGE
Pilgrim Nuclear Power Station	05000-293	1 OF 4

4. TITLE 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
									N/A	05000 N/A
05	03	2017	2017	- 008	- 00	06	30	2017	FACILITY NAME	DOCKET NUMBER
									N/A	05000 N/A

9. OPERATING MODE	11. THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: *(Check all that apply)*			
N	☐ 20.2201(b)	☐ 20.2203(a)(3)(i)	☐ 50.73(a)(2)(ii)(A)	☐ 50.73(a)(2)(viii)(A)
	☐ 20.2201(d)	☐ 20.2203(a)(3)(ii)	☐ 50.73(a)(2)(ii)(B)	☐ 50.73(a)(2)(viii)(B)
	☐ 20.2203(a)(1)	☐ 20.2203(a)(4)	☐ 50.73(a)(2)(iii)	☐ 50.73(a)(2)(ix)(A)
	☐ 20.2203(a)(2)(i)	☐ 50.36(c)(1)(i)(A)	☐ 50.73(a)(2)(iv)(A)	☐ 50.73(a)(2)(x)
10. POWER LEVEL	☐ 20.2203(a)(2)(ii)	☐ 50.36(c)(1)(ii)(A)	☐ 50.73(a)(2)(v)(A)	☐ 73.71(a)(4)
0	☐ 20.2203(a)(2)(iii)	☐ 50.36(c)(2)	☒ 50.73(a)(2)(v)(B)	☐ 73.71(a)(5)
	☐ 20.2203(a)(2)(iv)	☐ 50.46(a)(3)(ii)	☒ 50.73(a)(2)(v)(C)	☐ 73.77(a)(1)
	☐ 20.2203(a)(2)(v)	☐ 50.73(a)(2)(i)(A)	☒ 50.73(a)(2)(v)(D)	☐ 73.77(a)(2)(i)
	☐ 20.2203(a)(2)(vi)	☒ 50.73(a)(2)(i)(B)	☐ 50.73(a)(2)(vii)	☐ 73.77(a)(2)(ii)
		☐ 50.73(a)(2)(i)(C)	☐ OTHER Specify in Abstract below or in NRC Form 366A	

12. LICENSEE CONTACT FOR THIS LER

LICENSEE CONTACT	TELEPHONE NUMBER *(Include Area Code)*
Mr. Everett P. Perkins, Jr. - Regulatory Assurance Manager	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	ED	2	A109	Y					

14. SUPPLEMENTAL REPORT EXPECTED	15. EXPECTED SUBMISSION DATE	MONTH	DAY	YEAR
☒ YES *(If yes, complete 15. EXPECTED SUBMISSION DATE)* ☐ NO		09	20	2017

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 were 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 potentially in accordance with10 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 condition was discovered during the plants refueling outage when conditions were such that the equipment normally energized/activated by this time delay relay were not required to be operable. This event was not risk significant. There was no threat to public health and safety from this condition.

1. FACILITY NAME	2. DOCKET NUMBER	3. LER NUMBER		
		YEAR	SEQUENTIAL NUMBER	REV NO.
Pilgrim Nuclear Power Station	05000-293	2017	- 008	- 00

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 were 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.

During a degraded voltage condition on Bus B1 with normal alignment (Bus B1 powering Bus B6), relay 27A-B1X/TDDO would have energized and closed contact 3/5 instantaneously, which would have initiated the logic to transfer Bus B6 to Bus B2. However due to 27A-B1X/TDDO dropping out immediately, relay 27-B1X/TDE did not energize to cause the trip of Breaker 52-601 and closure of Breaker 52-602. This left the transfer of Bus B6 to Bus B2 incomplete.

Thus, with contact 3/5 of relay 27A-B1X/TDDO opening instantaneously instead of with a time delay, this portion of the transfer scheme to transfer Bus B6 to Bus B2 with Bus B1 powering Bus B6 and a degraded voltage on Bus B1 was inoperable.

However, the ability to perform a manual operation to transfer Bus B6 from Bus B1 to Bus B2 on a Bus B1 degraded voltage condition per Pilgrim Nuclear Power Station (PNPS) procedure 2.4.B.6, "Loss of Bus B6" was available. This transfer would re-power the LPCI injection valves and provide power to primary containment isolation valves.

CAUSE OF THE EVENT

The cause of the failure of time delay relay 27A-B1X/TDDO is indeterminate at this time. This relay has been sent to an offsite vendor for further testing and analysis.

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.

Forensic testing is being performed on the removed relay. Any additional corrective actions will be entered into the PNPS Corrective Action Program.

SAFETY CONSEQUENCES

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 and there is no firm evidence that it existed during plant operation.

If it did exist during plant operation and 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.

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/)

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		YEAR	SEQUENTIAL NUMBER	REV NO.
Pilgrim Nuclear Power Station	05000-293	2017	- 008	- 00

NARRATIVE

REPORTABILITY

Pilgrim Nuclear Power Station is submitting this Licensee Event Report (LER) in accordance with 10 CFR 50.73(a)(2)(i)(B) – Operation or condition prohibited by Technical Specifications; and potentially in accordance with10 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, although there is no firm evidence to support that the relay failure occurred before discovery. This LER will be updated following further evaluation of the cause of the failure.

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