Entergy

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Lawrence Coyle
Site Vice President

NL-16-056

May 25, 2016

U.S. Nuclear Regulatory Commission
Document Control Desk
11545 Rockville Pike, TWFN-2 F1
Rockville, MD 20852-2738

SUBJECT: Licensee Event Report # 2016-005-00, "Technical Specification (TS) Prohibited Condition Due to a Surveillance Requirement Never Performed for Testing the Trip of the Main Boiler Feedwater Pumps"
Indian Point Unit No. 2
Docket No. 50-247
DPR-26

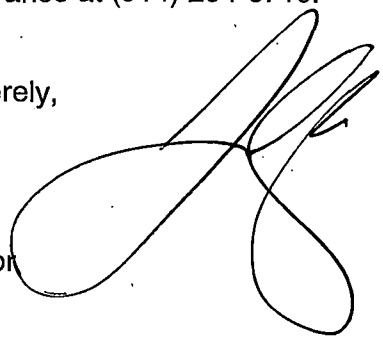
Dear Sir or Madam:

Pursuant to 10 CFR 50.73(a)(1), Entergy Nuclear Operations Inc. (ENO) hereby provides Licensee Event Report (LER) 2016-005-00. The attached LER identifies an event where there was a Technical Specification (TS) Prohibited Condition due to a TS surveillance Requirement never performed for trip of the Main Boiler Feedwater Pumps (MBFP). This condition is reportable under 10 CFR 50.73(a)(2)(i)(B) as a TS prohibited condition due to a surveillance requirement never performed. This condition was recorded in the Entergy Corrective Action Program as Condition Report CR-IP2-2016-02247.

IE22
NRR

There are no new commitments identified in this letter. Should you have any questions regarding this submittal, please contact Mr. Robert Walpole, Manager, Regulatory Assurance at (914) 254-6710.

Sincerely,



LC/cbr

Attachment: LER-2016-005

cc: Mr. Daniel H. Dorman, Regional Administrator, NRC Region I
NRC Resident Inspector's Office
Ms. Bridget Frymire, New York State Public Service Commission

NRC FORM 366 (01-2014) U.S. NUCLEAR REGULATORY COMMISSION

APPROVED BY OMB NO. 3150-0104 EXPIRES: 1/31/2017

Estimated burden per response to comply with this mandatory collection request: 50 hours. Reported lessons learned are incorporated into the licensing process and fed back to industry. Send comments regarding burden estimate to the Records and FOIA/Privacy Service Branch (T-5 F52), U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, or by internet e-mail to infocollects@nrc.gov, and to the Desk Officer, Office of Information and Regulatory Affairs, NEOB-I0202, (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.

LICENSEE EVENT REPORT (LER)

1. FACILITY NAME:	2. DOCKET NUMBER	3. PAGE
INDIAN POINT 2	05000-247	1 OF 4

4. TITLE: Technical Specification (TS) Prohibited Condition Due to a Surveillance Requirement Never Performed for Testing the Trip of the Main Boiler Feedwater Pumps

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
03	26	2016	2016	005	00	05	25	2016		05000
									FACILITY NAME	DOCKET NUMBER
										05000

9. OPERATING MODE

6

10. POWER LEVEL

000%

11. THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: *(Check all that apply)*

☐ 20.2201(b)	☐ 20.2203(a)(3)(i)	☐ 50.73(a)(2)(i)(C)	☐ 50.73(a)(2)(vii)
☐ 20.2201(d)	☐ 20.2203(a)(3)(ii)	☐ 50.73(a)(2)(ii)(A)	☐ 50.73(a)(2)(viii)(A)
☐ 20.2203(a)(1)	☐ 20.2203(a)(4)	☐ 50.73(a)(2)(ii)(B)	☐ 50.73(a)(2)(viii)(B)
☐ 20.2203(a)(2)(i)	☐ 50.36(c)(1)(i)(A)	☐ 50.73(a)(2)(iii)	☐ 50.73(a)(2)(ix)(A)
☐ 20.2203(a)(2)(ii)	☐ 50.36(c)(1)(ii)(A)	☐ 50.73(a)(2)(iv)(A)	☐ 50.73(a)(2)(x)
☐ 20.2203(a)(2)(iii)	☐ 50.36(c)(2)	☐ 50.73(a)(2)(v)(A)	☐ 73.71(a)(4)
☐ 20.2203(a)(2)(iv)	☐ 50.46(a)(3)(ii)	☐ 50.73(a)(2)(v)(B)	☐ 73.71(a)(5)
☐ 20.2203(a)(2)(v)	☐ 50.73(a)(2)(i)(A)	☐ 50.73(a)(2)(v)(C)	☐ OTHER
☐ 20.2203(a)(2)(vi)	☒ 50.73(a)(2)(i)(B)	☐ 50.73(a)(2)(v)(D)	Specify in Abstract below or in NRC Form 366A

12. LICENSEE CONTACT FOR THIS LER

NAME	TELEPHONE NUMBER *(Include Area Code)*
Anthony King, Engineer, Engineering Design I&C	(914) 254-7477

13. COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT

CAUSE	SYSTEM	COMPONENT	MANU-FACTURER	REPORTABLE TO EPIX	CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO EPIX
D	JK	SOL		Y					

14. SUPPLEMENTAL REPORT EXPECTED

☐ YES *(If yes, complete 15. EXPECTED SUBMISSION DATE)* ☒ NO

15. EXPECTED SUBMISSION DATE

MONTH	DAY	YEAR

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

On March 26, 2016, during a refueling outage, an NRC inspector identified that the trip of the MBFPs is not tested in accordance with Technical Specification 3.7.3 (Main Feedwater System) Surveillance Requirement (SR) 3.7.3.3. This was discovered as a result of an assessment of the failure of the Main Boiler Feedwater Pumps (MBFPs) steam stop valves to close after the reactor trip on December 5, 2015.

TS SR 3.7.3.3 requires testing the MBFP trip function every 24 months on an actual or simulated actuation signal. Surveillance tests 2-PT-V024DS60 and 2-PT-V24DS61 are performed every 24 months, but only test up to the limit switch contact that actuates the MBFP turbine trip solenoid valves and does not include the trip of the pump. A review determined the requirement to verify the trip of the MBFPs was added to the TS during the implementation of the improved TS (ITS) conversion program in 2004 but the corresponding testing was not added to the surveillance tests. The direct cause was human error for failure to ensure testing was established to meet new ITS SRs. The apparent cause of the error is indeterminate due to the time passed since TS conversion by Amendment 238 on November 21, 2003. Corrective actions include revision of Surveillance tests 2-PT-V024DS60 and 2-PT-V24DS61 to test tripping of the MBFPs. The MBFPs will be tested per the revised procedures prior to startup from the outage. The event had no significant effect on public health and safety.

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NARRATIVE *(If more space is required, use additional copies of NRC Form 366A)* **(17)**

Note: The Energy Industry Identification System Codes are identified within the brackets {}.

DESCRIPTION OF EVENT

On March 26, 2016, during a refueling outage, an NRC inspector identified that the trip of the MBFPs is not tested in accordance with Technical Specification 3.7.3 (Main Feedwater System) Surveillance Requirement (SR) 3.7.3.3. This was discovered as a result of an assessment of the failure of the Main Boiler Feedwater Pumps (MBFPs) steam stop valves to close after the reactor trip on December 5, 2015. TS SR 3.7.3.3 requires testing the MBFP trip function {JK} every 24 months on an actual or simulated actuation signal. Surveillance tests 2-PT-V024DS60 and 2-PT-V24DS61 are performed every 24 months, but only test up to the limit switch contact that actuates the MBFP turbine trip solenoid valves and does not include the trip of the pump {P}. A review determined the requirement to verify the trip of the MBFPs was added to the TS during the implementation of the improved TS (ITS) conversion program but the corresponding testing for MBFP trip was not added to the surveillance tests. The condition was recorded in the Indian Point Energy Center (IPEC) Corrective Action Program (CAP) in Condition Report CR-IP2-2016-02247.

The condition was revealed as a result of the plant trip on December 5, 2015, when the MBFP did not trip remotely or locally, but required manual closure of steam admission valves to trip it. The plant trip was recorded in CR-IP2-2015-05458 noting an unexpected condition where the 21 MBFP HP and LP steam stop valves failed to close and the 21 MBFP startup signal failed to lower from the control room. The cause of the failure of the 21 MBFP to trip was contaminated control oil.

The MBFPs are steam driven pumps single stage, diffuser type, centrifugal pumps with a capacity of approximately 15,300 gpm. Pumps are manufactured by Ingersoll-Rand, type 16 JT. Both MBFPs are driven by a Westinghouse turbine {TRB}. During normal operation, low pressure steam enters through the stop valve bolted to the end of the steam chest. Steam flow is regulated by positioning of the governor valves within the steam chest. MBFP turbine control system (JK} consists of an electronic governor, electronic hand speed changer, hydraulically operated governor valve positioner and solenoid operated stop valve controllers. The stop valve control oil pressure opens and closes the stop valves by means of solenoid operated valves 29 and 31 {SOL}. Stop valves are provided in the main (high pressure) and reheat (low pressure) steam lines before the high and low pressure governor valves. The stop valves are operated by servomotors which receive control and operating oil from the high pressure oil system. High pressure control oil to the servomotor positioning relay is controlled by the high and low pressure stop valve solenoids. Each stop valve control solenoid when operated manually or electrically by its control push button (open-close from the CR) will open or close its respective valve. When the solenoids open, the high pressure control oil is dumped and the stop valves close.

A historical review of the TS determined the custom TS (CTS) did not include a TS SR to trip test the MBFPs. The inclusion of the TS SR to trip test the MBFPs occurred when the CTS were converted to the Improved TS (ITS) based on NUREG-1431. The TS conversion was conducted as a ITS Project by a contractor which included revising existing procedures and preparing new procedures to address new ITS test requirements. In those cases where the ITS requirements were new procedures they were prepared to address the surveillance requirement. The project initially did not have specific department representatives assigned to support the project and verify the SRs. The department review process had no formal project guidelines or procedures. It is indeterminate why the test of the MBFP was missed during the review/implementation process.

An extent of condition (EOC) review determined that the Unit 3 TS 3.7.3 does not have a surveillance requirement to trip test the MBFPs. The EOC review identified an adverse trend CR in 2004 during the ITS conversion. As a result of the adverse trend CR an action plan was implemented that included an action to review the ITS surveillance testing requirements and basis against test procedures for compliance in meeting the ITS SR. Several changes were identified and corrections implemented.

Cause of Event

The direct cause of not testing that the MBFP tripped on an actuation signal was human error for failure to ensure testing was established to meet new ITS SRs. The apparent cause of the error is indeterminate due to the time passed since TS conversion by Amendment 238 on November 21, 2003. A review determined the requirement to verify the trip of the MBFPs was added to the TS during the implementation of the improved TS (ITS) conversion program but the complete testing to include a MBFP trip was not added to the surveillance tests.

Corrective Actions

The following corrective actions have been or will be performed under Entergy's Corrective Action Program to address the cause and prevent recurrence:

- Surveillance test procedures 2-PT-V024 DS060 and 2-PT-V024 DS061 were revised to trip the MBFPs to satisfy the test surveillance requirement SR 3.7.3.3 of TS 3.7.3.
- Testing of the MBFP actuation function to include pump trip will be performed prior to startup from the outage.

Event Analysis

The event is reportable under 10 CFR 50.73(a)(2)(i)(B). The licensee shall report any operation or condition which was prohibited by the plant's TS. This condition meets the reporting criteria because TS 3.7.3 (Main Feedwater System) requires the two MBFP discharge valves and the trip function to be operable. TS 3.7.3 Condition D (One or both MBFP trips inoperable) required action D.1 is to restore MBFP trip to operable or trip the associated MBFP within 72 hours. Condition F (Required action and associated completion time not met) required action F.1 is to be in mode 3 in 6 hours and F.2 be in mode 4 in 12 hours. The trip function of the MBFP was deemed inoperable because it was determined the TS SR 3.7.3.3 surveillance procedures did not trip the MBFPs to demonstrate operability. Initially the condition appeared to be a missed surveillance. However, review of regulatory action on this issue determined that the condition would not be considered a failure to perform a surveillance within the specified frequency in accordance with SR applicability 3.0.1 which would be a failure to meet the LCO except as provided in SR 3.0.3. Because there was no surveillance to test the trip of the MBFPs, the condition meets the NRC guidance and is being treated as a TS prohibited condition.

There was no safety system functional failure reportable under 10 CFR 50.73(a)(2)(v). Isolation of the main FW would have been accomplished by closure of the Main FW Regulating Valves (MFRVs), and the closure of all four Low Flow Main FW Bypass Valves (FBVs). In accordance with TS Basis 3.7.3, if all four Main Feedwater Regulating Valves (MFRVs) and all four Low Flow Main Feedwater Bypass Valves (FBVs) close within the time limits that satisfy accident analysis assumptions, main FW isolation to all four steam generators (SGs) is satisfied. Closure of both MBFP discharge valves which initiates closure of all eight MFRVs and trip of both MBFPs is a redundancy feature. In accordance with reporting guidance in NUREG-1022, an additional random single failure need not be assumed in that system during the condition.

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NARRATIVE *(If more space is required, use additional copies of NRC Form 366A)* **(17)**

Past Similar Events

A review was performed of the past three years of Licensee Event Reports (LERs) for events reporting a TS violation due to inoperable MBFPs trip function. No LERs were identified.

Safety Significance

This event had no effect on the health and safety of the public. There were no actual safety consequences for the event because there were no accidents or events during the degraded condition.

Isolation of the main FW system is necessary to mitigate accident and transient conditions [Main Steam Line Breaks (SLB), SG Tube Ruptures, and Excessive Heat Removal Due to FW System Malfunction]. Main FW must be isolated to prevent excessive reactor coolant system cooldown, containment overpressure, and steam line overfill. Main FW isolation is initiated by either an Engineered Safety Feature Actuation System (ESFAS) safety injection (SI) signal or a high steam generator water level signal. Main FW isolation to all four SGs is provided by either 1) Closure of all four main FW regulating valves (MFRVs) and all four Low Flow Main FW Bypass Valves (FBVs), or 2) Closure of both MBFP discharge valves which initiates closure of all eight FW Isolation Valves (MFIVs), and the trip of both MBFPs. Either of these combinations is capable of achieving main FW isolation to all four SGs within the time limits assumed in the accident analysis. If all eight valves referenced in item 1 close, main FW isolation to all four SGs is completed within time limits that satisfy accident analysis assumptions. To establish redundancy for main FW isolation safety function, the SI ESFAS or High SG Level signal also provides a direct signal that closes the two MBFP discharge valves. When both MBFP discharge valves move off the open seat, the relay actuates and generates a signal that initiates closure of the four main FW isolation valves (MFIVs) and the four Low Flow FIVs. For this event, one of the FW isolation capabilities was operable as the post transient report for the reactor trip on December 5, 2015, recorded FW isolated. This event was bounded by the analyzed event described in FSAR Section 14.1.10, (Excessive Heat Removal Due to Feedwater System Malfunctions). Excessive FW additions is an analyzed event postulated to occur from a malfunction of the FW control system or an operator error which results in the opening of a FW control valve. The analysis assumes one FW valve opens fully resulting in the excessive FW flow to one SG. For the FW system malfunction at full power, the FW flow resulting from a fully open control valve is terminated by the SG high level signal that closes all FW control valves and trips the MBFPs. The SG high water level signal also produces a signal to trip the main turbine which initiates a reactor trip. The analysis for all cases of the excessive FW addition initiated at full power conditions with and without automatic rod control, show that the minimum DNBR remains above the applicable safety analysis DNBR limit. In the case of excessive FW flow with the reactor at zero power, the resulting transient is similar to, but less severe than the hypothetical steamline break transient and is bounded by the analysis in UFSAR Section 14.2.5 (Rupture of a Steam Pipe).