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Lawrence Coyle
Site Vice President

NL-15-108

August 28, 2015

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

SUBJECT: Licensee Event Report # 2015-006-00, "Technical Specification Prohibited Condition Due to Two Pressurizer Code Safety Valves Discovered Outside Their As-Found Lift Setpoint Test Acceptance Criteria"
Indian Point Unit No. 3
Docket No. 50-286
DPR-64

Dear Sir or Madam:

Pursuant to 10 CFR 50.73(a)(1), Entergy Nuclear Operations Inc. (ENO) hereby provides Licensee Event Report (LER) 2015-006-00. The attached LER identifies an event where there was a Technical Specification prohibited condition for two inoperable Pressurizer Safety Valves, which is reportable under 10 CFR 50.73(a)(2)(i)(B). This condition was recorded in the Entergy Corrective Action Program as Condition Report CR-IP3-2015-03710.

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

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

IE22
NRR

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

APPROVED BY OMB NO. 3150-0104 EXPIRES: 01/31/2017

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 Records and FOIA/Privacy Service 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-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 3	05000-286	1 OF 4

4. TITLE: Technical Specification Prohibited Condition Due to Two Pressurizer Code Safety Valves Discovered Outside their As-Found Lift Setpoint Test Acceptance Criteria

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
7	1	2015	2015	006 -	00	8	28	2015		05000
									FACILITY NAME	DOCKET NUMBER
										05000

9. OPERATING MODE

1

10. POWER LEVEL

100%

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)*
John Garry, Engineering Systems-BOP	(914) 254-6881

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
X	AB	RV	C711	Y					

14. SUPPLEMENTAL REPORT EXPECTED

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

15. EXPECTED SUBMISSION DATE

MONTH	DAY	YEAR
11	27	2015

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

On July 1, 2015, Engineering was notified by Wyle Laboratories that two of three Pressurizer Code Safety Valves (RC-PCV-464 and RC-PCV-468) were outside their As-Found lift set point test acceptance criteria (2411 - 2559 psig). The As-Found set pressure testing acceptance criterion for operability is 2485 +/-3%. The SVs were removed during the last refueling outage (RO) in the spring of 2015 and sent offsite for testing. Testing was performed within one year of removal as required by the Inservice Testing Program. SV RC-PCV-464 lifted at 2573 psig and SV RC-PCV-468 lifted at 2379 psig which is outside their set pressure range. The remaining SV tested satisfactorily. All three SVs were found with zero seat leakage. During the RO all three SVs were removed and replaced with certified pre-tested spare SVs. The SVs installed during the RO were As-Left tested to 2485 +/-1% with zero seat leakage in accordance with procedure 3-PT-R5A. Technical Specification (TS) 3.4.10 (Pressurizer Safety Valves), requires three pressurizer safety valves to be operable with lift settings set at greater than 2460 psig and less than 2510 psig. TS Surveillance Requirement (SR) 3.4.10.1 requires each PSV to be verified operable in accordance with the Inservice Testing Program. The most probable cause of SV RC-PCV-464 lifting greater than 3% of its nominal setpoint was setpoint drift. The most probable cause of RC-PCV-468 lifting below 3% of its nominal setpoint was spring relaxation. Corrective action will be to perform a valve disassembly and inspection to determine the cause of the failure. The event had no effect on public health and safety.

FACILITY NAME (1)	DOCKET (2)	LER NUMBER (6)			PAGE (3)
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	
Indian Point Unit 3	05000-286	2015	- 006	- 00	2 OF 4

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 July 1, 2015, Engineering was notified by Wyle Laboratories that two of three Pressurizer {AB} Code Safety Valves (RC-PCV-464 and RC-PCV-468) {RV} removed during the spring 2015 refueling outage (RO) failed their As-Found lift set point test acceptance criteria (2411 - 2559 psig). The As-Found set pressure testing acceptance criterion for operability is 2485 +/-3%. The SVs were removed during the last refueling outage (RO) in the spring of 2015 and sent offsite for testing. Testing was performed within one year of removal as required by the Inservice Testing Program. Testing found SV RC-PCV-464 as-found lift pressure was 2573 (0.5% above the allowable As-Found upper limit of 2559 psig), and SV RC-PCV-468 as-found lift pressure was 2379 psig (1.2% below allowable AS-Found lower limit of 2411 psig), which is outside their set pressure range acceptance criterion. The remaining SV lift tested satisfactorily. All three SVs were found with zero seat leakage. During the RO all three SVs were removed and replaced with certified pre-tested spare SVs. The SVs installed during the RO were As-Left tested to 2485 +/-1% with zero seat leakage in accordance with procedure 3-PT-R5A. Technical Specification (TS) 3.4.10 (Pressurizer Safety Valves), requires three pressurizer safety valves to be operable with lift settings set at greater than 2460 psig and less than 2510 psig. TS Surveillance Requirement (SR) 3.4.10.1 requires each PSV to be verified operable in accordance with the Inservice Testing Program. The condition was recorded in the Indian Point Energy Center (IPEC) Corrective Action Program (CAP) in Condition Report CR-IP3-2015-03710 and CR-IP3-2015-03708.

The pressurizer safety valves, in conjunction with the reactor protection system {JC}, provide overpressure protection for the reactor coolant system (RCS) {AB}. The pressurizer safety valves (SVs) are totally enclosed pop type, spring loaded, self-actuating 6 inch by 6 inch valves manufactured by Crosby Valve Company {C711}, Model HB-BP-86 Type E. The SVs are designed to prevent the system pressure from exceeding the system Safety Limit (SL) of 2735 psig, which is 110% of the design pressure. The SVs have an active safety function in the open position to prevent overpressure of the RCS. The SVs also have an active safety function in the closed position to prevent the loss of RCS inventory. Three pressurizer SVs (RC-PCV-464, RC-PCV-466, RC-PCV-468) discharge to the Pressurizer Relief Tank (PRT) and are designed with a set pressure of 2485 psig. Acceptable As-Left testing prior to installation requires the SVs to be set at 2485 psig +/-1% with zero seat leakage to compensate for set point drift over its operating cycle. The As-Found set pressure testing acceptance criterion for operability is 2485 +/- 3%. The pressurizer SVs are categorized as Class 1 safety relief valves in the Inservice Testing Program. All three pressurizer SVs are removed and replaced with pre-tested spares each refueling outage in order to satisfy the ASME OM Code-2001 requirement for Class 1 pressure relief valves. Upon replacement, all three of the removed SVs are tested within one year of removal from the system. Technical Specification (TS) 3.4.10 (Pressurizer Safety Valves) requires three pressurizer safety valves to be operable with lift settings set at greater than 2460 psig and less than 2510 psig. TS Surveillance Requirement (SR) 3.4.10.1 requires each PSV to be verified operable in accordance with the Inservice Testing Program.

An extent of condition review determined that the condition is limited to the pressurizer SVs since there are no other relief valves in the RCS or balance of plant that are subjected to the same temperatures, pressures and environment. These are the only valves with these service conditions that are tested at an offsite facility for as-found setpoint and seat leakage, overhauled and then as-left tested and certified for 5 years. The Main Steam Safety Valves (MSSVs) were categorized as similar. The MSSVs are tested in their installed location with different test equipment and procedures and are rebuilt on-site by the Maintenance Department.

The Cause of Event

The exact cause of failure of valves RC-PCV-464 and RC-PCV-468 is not known at this time. The most probable cause of SV RC-PCV-464 lifting greater than 3% of its nominal setpoint was setpoint drift. The most probable cause of RC-PCV-468 lifting within less than 3% of its nominal setpoint was spring relaxation. The two valves that failed As-Found testing criteria (valve RC-PCV-464 and RC-PCV-468) will be disassembled and inspected to determine the cause of the failure.

Corrective Actions

The following corrective actions were or will be performed under the Corrective Action Program (CAP) to address the causes of this event.

- Valve RC-PCV-464 and RC-PCV-468 and valve RC-PCV-466 were replaced with pretested spares during the refueling outage in the spring of 2015.
- The two valves that failed As-Found testing criteria (valve RC-PCV-464 and RC-PCV-468) will be disassembled and inspected to determine the cause of the failure.
- A review will be performed of the valve inspection report and applicable corrective actions identified and implemented.
- This LER will be revised as necessary based on the results of the vendor report after valve inspection.

Event Analysis

The event is reportable under 10CFR50.73(a)(2)(i)(B). The licensee shall report any operation or condition which was prohibited by the plant TS. TS 3.4.10 (Pressurizer Safety Valves) Limiting Condition for Operation (LCO) requires three pressurizer safety valves to be operable with lift settings set greater than 2460 psig and less than 2510 psig.

During testing, SV RC-PCV-464 as-found lift pressure was 2573 (0.5% above allowable As-Found upper limit 2559 psig), and SV RC-PCV-468 as-found lift pressure was 2379 psig (1.2% below allowable As-Found lower limit of 2411 psig), which is outside their set pressure range acceptance criterion. TS 3.4.10 Condition B (Required action and associated completion time not met or Two or more pressurizer safety valves inoperable) required action B.1 is be in Mode 3 in 6 hours and B.2 be in Mode 4 within 12 hours. This TS action was not performed and the actions of Condition B not implemented, the condition is a TS prohibited condition. In the UFSAR Chapter 14 analysis, the opening setpoint of the three PSRVs is assumed to be at +/-4% of the nominal 2485 psig value for applicable Chapter 14 transients. The as-found result of the PSRV RC-PCV-464 test (+3.54%) is acceptable from a safety function standpoint since +3.54% is less than +4%. The as-found result of the PSRV RC-PCV-468 test (-4.26%) is acceptable from a pressure boundary protection safety function standpoint since -4.26% is well below +4%. As all primary safety systems functioned properly there was no safety system functional failure reportable under 10CFR50.73(a)(2)(v).

Past Similar Events

A review was performed of Licensee Event Reports (LERs) for the past three years for any events reporting TS prohibited conditions due to pressurizer SVs outside their As-Found lift set point test acceptance criteria. One LER was identified. LER-2012-003 reported one pressurizer code safety valve (RC PCV-468) outside its As-Found lift set point test acceptance criteria. The reported cause was internal friction within the valve. Internal friction possible causes were 1) sticking between the valve disc and seat, 2) contact between the valve spindle and guide.

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 no events that required the pressurizer SRVs. An evaluation was performed on the potential impact of the condition on accident analysis and best estimate plant response. The best estimate plant response to applicable accidents and transients would not be impacted by the as-found valve lift conditions. The non-LOCA analyses that could be impacted by the condition are: 1) Loss of load/Turbine Trip (LOL/TT), 2) Loss of normal feedwater/loss of non-emergency AC power (LONF/LOAC), 3) Loss of flow/locked rotor (LOF/LR), 4) Rod withdrawal at power (RWAP), and 5) Anticipated Transient Without Scram (ATWS). The PSRVs provide overpressure protection for the Reactor Coolant System (RCS) in conjunction with the Reactor Protection System. Events such as Loss of Coolant Accidents (LOCA), Main Steam Line Break (MSLB), Steam Generator Tube Rupture (SGTR), and dropped rod evaluated in UFSAR Chapter 14, produce a decrease in RCS pressure and therefore the reactor coolant pressure boundary (RCPB) protection provided by the PSRVs need not be credited. An assessment of the existing analyses of the applicable non-LOCA transients concluded that the impact of the condition on these non-LOCA transients is either negligible or insignificant. The UFSAR Chapter 14 analyses remains valid with the as-found PSRV condition. In the UFSAR Chapter 14 analysis, the opening setpoint of the three PSRVs is assumed to be at +/-4% of the nominal 2485 psig value for all four of the Chapter 14 transients (LOL/TT, LONF/LOAC, LOF/LR, and RWAP). PSRV RC-PCV-464 as-found lift pressure was 2573 (3.54% above nominal setpoint of 2485 psig). PSRV RC-PCV-468 as-found lift pressure was 2379 psig (4.26% below nominal setpoint pressure of 2485 psig). The as-found result of the PSRV RC-PCV-464 test (+3.54%) is acceptable from a safety function standpoint since +3.54% is less than +4%. The as-found result of the PSRV RC-PCV-468 test (-4.26%) is acceptable from a pressure boundary protection safety function standpoint since -4.26% is well below +4%. For the LONF/LOAC event the concern is not only RCS over pressurization but potential water relief from a solid pressurizer. The analysis of the LONF/LOAC event conservatively assumes that the pressurizer pressure control system (including pressurizer spray and PORVs) is available and that the PSRV setpoint is -4% of nominal. This assumption involving the PSRVs is conservative because it would allow earlier mass release from the pressurizer if water solid conditions should occur but has the potential undesirable result of loss of significant RCS mass and volume.

The analysis of the LONF/LOAC transient for the Stretch Power Uprate (SUP) Project showed the pressurizer would not become water solid because of acceptable function of the Auxiliary Feedwater system and the Main Steam Safety Valves and/or Main Steam Atmospheric Dump Valves. Therefore, the early lift of PSRV RC-PCV-468 at a setting slightly below -4% of nominal has no bearing on the progression of the LONF/LOAC event.

Although the anticipated transient without scram (ATWS) is not one of the transients evaluated in UFSAR Chapter 14, the PSRVs are credited for this event. The design capacity of each of the three PSRVs is 420,000 lbm/hr. This capacity is greater than the PSRV relief capacity of 408,000 lbm/hr assumed in the 1979 generic ATWS analysis. As such, this would result in an overall peak pressure benefit when compared to peak RCS pressure calculated for the generic limiting ATWS events. Further, the most current peak RCS pressure determined in the most recent ATWS analysis for the Unit 3 Stretch Power Uprate Project is 2862 psia. This peak RCS pressure, the TS safety limit (SL), and the as-found lift pressures are all significantly less than the ASME B&PV Code Level C service stress criterion input of 3215 psia.