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Site Vice President

NL-12-057

May 25, 2012

U.S. Nuclear Regulatory Commission
Attn: Document Control Desk
Mail Stop O-P1-17
Washington, D.C. 20555-0001

SUBJECT: Licensee Event Report # 2012-004-00, "Unanalyzed Condition and Safety System Functional Failure due to Use of Rad Bypass Switch for Steam Generator Blowdown Isolation Valves which Defeats Their Automatic Isolation for Analyzed Events"
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) 2012-004-00. The attached LER identifies an event where there was an unanalyzed condition and a safety system functional failure due to use of the Rad Bypass switch for Steam Generator blowdown isolation valves during testing which defeats their automatic isolation for analyzed events. This condition is reportable under 10 CFR 50.73(a)(2)(ii)(B) and 10CFR50.73(a)(2)(v)(B). This condition was recorded in the Entergy Corrective Action Program as Condition Report CR-IP2-2012-02408.

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

Sincerely,

Patrick W. Conway for J. A. Ventosa

JAV/cbr

cc: Mr. William Dean, Regional Administrator, NRC Region I
NRC Resident Inspector's Office, Indian Point 2
Mrs. Bridget Frymire, New York State Public Service Commission
LEREvents@inpo.org

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LICENSEE EVENT REPORT (LER)

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-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: INDIAN POINT 2

2. DOCKET NUMBER
05000-2473. PAGE
1 OF 4

4. TITLE: Unanalyzed Condition and Safety System Functional Failure due to Use of Rad Bypass Switch for Steam Generator Blowdown Isolation Valves which Defeats Their Automatic Isolation for Analyzed Events

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	28	2012	2012	004	00	05	25	2012	FACILITY NAME	DOCKET NUMBER 05000
9. OPERATING MODE 1			11. THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check all that apply)							
10. POWER LEVEL 100%			<input type="checkbox"/> 20.2201(b)		<input type="checkbox"/> 20.2203(a)(3)(i)		<input type="checkbox"/> 50.73(a)(2)(i)(C)		<input type="checkbox"/> 50.73(a)(2)(vii)	
			<input type="checkbox"/> 20.2201(d)		<input type="checkbox"/> 20.2203(a)(3)(ii)		<input type="checkbox"/> 50.73(a)(2)(ii)(A)		<input type="checkbox"/> 50.73(a)(2)(viii)(A)	
			<input type="checkbox"/> 20.2203(a)(1)		<input type="checkbox"/> 20.2203(a)(4)		<input checked="" type="checkbox"/> 50.73(a)(2)(ii)(B)		<input type="checkbox"/> 50.73(a)(2)(viii)(B)	
			<input type="checkbox"/> 20.2203(a)(2)(i)		<input type="checkbox"/> 50.36(c)(1)(i)(A)		<input type="checkbox"/> 50.73(a)(2)(iii)		<input type="checkbox"/> 50.73(a)(2)(ix)(A)	
			<input type="checkbox"/> 20.2203(a)(2)(ii)		<input type="checkbox"/> 50.36(c)(1)(ii)(A)		<input type="checkbox"/> 50.73(a)(2)(iv)(A)		<input type="checkbox"/> 50.73(a)(2)(x)	
			<input type="checkbox"/> 20.2203(a)(2)(iii)		<input type="checkbox"/> 50.36(c)(2)		<input type="checkbox"/> 50.73(a)(2)(v)(A)		<input type="checkbox"/> 73.71(a)(4)	
			<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)(B)		<input type="checkbox"/> 73.71(a)(5)	
<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)(C)		<input type="checkbox"/> OTHER				
<input type="checkbox"/> 20.2203(a)(2)(vi)		<input type="checkbox"/> 50.73(a)(2)(i)(B)		<input type="checkbox"/> 50.73(a)(2)(v)(D)		Specify in Abstract below or in NRC Form 366A				

12. LICENSEE CONTACT FOR THIS LER

NAME
Carl Smyers, Assistant Operations Manager SupportTELEPHONE NUMBER (Include Area Code)
(914) 254- 5585

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

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 27, 2012, it was identified that use of the Rad Bypass switch position for Steam Generator (SG) blowdown isolation valves would defeat the automatic isolation of the blowdown isolation valves for degraded heat sink events (Loss of Normal Feedwater, Loss of All AC Power to Station Auxiliaries). The normal valve position is open and Auto close for heat sink events in addition to containment Phase A isolation. These analyzed events assume SG blowdown (SGBD) isolation occurs and continuous SG blowdown during these events has not been analyzed. SG inventory would not be maintained because one Auxiliary Feedwater pump would not provide adequate flow with the blowdown isolation valves open. On January 19, 2011, test 2-PC-2Y23-49 (Liquid Radiation Monitor Calibration) was initiated which positioned all SG blowdown isolation valve switches to Rad Bypass. During this time on January 20, 2011, the 21 Auxiliary Feedwater Pump was removed from service for testing. On January 27, 2011, testing per 2-PC-2Y23-49 was completed. The apparent cause was the inappropriate revision of test procedure 2-PC-2Y23-49 in 2002 that deleted information previously incorporated from an operating event at unit 3 that restricted when the blowdown radiation monitor could be tested. Corrective actions included revision of procedure 2-PC-2Y23-49 to delete steps to place in Rad Bypass while performing Radiation Monitor R-49 calibration and installation of a test jumper to disable the blowdown function. The UFSAR will be revised to provide the assumptions credited in accident analysis for SGBD isolation. 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 27, 2012, it was identified that use of the Rad Bypass switch {HIS} position for Steam Generator (SG) blowdown {WI} isolation valves {ISV} during modes 1-3 would defeat the automatic isolation of the blowdown isolation valves for degraded heat sink events (Loss of Normal Feedwater, Loss of All AC Power to Station Auxiliaries). The normal SG blowdown containment isolation valve position is open and to Auto close for heat sink events in addition to containment Phase A isolation. The Containment Phase A isolation function is unaffected. These analyzed events assume SG blowdown isolation occurs and continuous SG blowdown during these events has not been analyzed. SG inventory would not be maintained if only one motor driven Auxiliary Feedwater (AFW) {BA} pump {P} was available to provide flow with the blowdown isolation valves open. Event analysis assumes a single failure of one train of AFW. A review of past operation for usage of Rad Bypass identified that on January 19, 2011, at 13:45 hours, testing per 2-PC-2Y23-49 (Liquid Radiation Monitor Calibration) was initiated and all SG blowdown isolation valve switches were placed to Rad Bypass. On January 27, 2011, at 14:22 hours, test 2-PC-2Y23-49 was completed satisfactorily. During this time on January 20, 2011, at 05:23 hours, the 21 Auxiliary Feedwater Pump (AFWP) was removed from service for testing per 2-PC-EM8A [Auxiliary Feedwater Flow Instruments (Loop 21 Calibration)]. Operators entered Technical Specification 3.7.5 Condition B (one train AFW inoperable). At 18:02 hours on January 20, 2011, testing per 2-PC-EM8A was completed and the 21 AFWP aligned for normal service and TS 3.7.5 exited. The condition was recorded in the Indian Point Energy Center (IPEC) Corrective Action Program (CAP) as Condition Report CR-IP2-2012-02408.

The primary function of the SG blowdown system is to aid in maintaining the secondary side water chemistry of the SGs within specification. Secondary functions include providing samples of water in the secondary side of the SG, and providing a means of draining the shell side of the SGs for inspection and maintenance. There are four SGs and one blowdown line for each SG. The blowdown lines exit containment and each header is equipped with two containment isolation valves which can be remotely operated from the Control Room {NA}. After leaving containment the blowdown lines are routed to a blowdown flash tank that vents to atmosphere through a pressure reduction blowdown valve (MS-71) which throttles blowdown flow. Valve MS-71 is normally adjusted to a blowdown rate of 20 gpm. The main blowdown isolation valves (PCV-1214/1214A through PCV-1217/1217A) automatically trip shut on the following signal: 1) containment Isolation Phase A, 2) High Radiation as measured by R-49, 3) Automatic start signal for the motor driven AFWPs, 4) ATWS Mitigation system Actuation circuit (AMSAC) activation upon a very low SG water level, 5) Main Boiler Feed pump trip. The blowdown isolation valves can be closed through a single Close-Remote switch on the SN panel in the Control Room. Each valve is provided with position indicating lights in the Control Room.

The purpose of procedure 2-PC-2Y23-49 is to calibrate Liquid Radiation Monitors (R-54, R-49, R-39, R-40, R-46, R-53, R-51, R-47, R-59, R-52 and R-53). The procedure is an Instrumentation and Control (I&C) procedure with operations performing actions as required. The procedure has a Caution that during testing of monitor R-49, placing a SG blowdown valve control switch in Rad Bypass inhibits its automatic closure for AMSAC, Main Boiler Feed Pump trip, and AFWP start (AMSAC is degraded but not inoperable).

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As a result of an OE at unit 3 (OE 12628, Defeating Steam Generator Blowdown Isolation) unit 2 test procedure 2-PC-2Y23-49 was changed by revision 2 effective October 18, 2001, by adding General Information step 2.8; (The use of Rad Bypass when testing R-49 requires plant condition of less than 350 degrees F. Refer to CR-IP3-2001-08038 for supporting information for this test condition), and a Prerequisite step 4.1 (R-49 shall be tested when RCS Temperature is less than 350 degrees F. For all other monitors listed in Section 1.0 this procedure may be performed regardless of plant operating status.). Revision 3 of the procedure effective September 21, 2002, deleted the general information step 2.8 and prerequisite step 4.1. Revision 3 added three Precautions and Limitation steps: 1) Step 3.6 If testing monitor R-49, ensure the requirements of Technical Specification (TS) Table 3.9-1, Item I.B are met. The referenced TS is the requirement to perform manual grab samples when R-49 is inoperable. 2) Step 3.7 During testing of monitor R-49, placing a SG blowdown valve control in Rad Bypass inhibits its automatic closure for AMSAC, Main Boiler Feed Pump trip, and Auxiliary boiler feed pump start. AMSAC is degraded, not inoperable. (Reference Standard Operating Procedure (SOP)-7.1 (SG Blowdown Sample Operation). SOP-7.1 does contain the referenced statement regarding the use of the Rad Bypass switch. However, the SOP only uses Rad Bypass for sampling and restricts the use of it to one SG at a time. 3) Step 3.8 This procedure may be performed regardless of plant operating status. Implementation of 2-PC-2Y23-49 Revision 3 effectively removed the restriction on using the Rad Bypass switch above 350 degrees F as a result of an inadequate review of an existing OE and misapplication of a statement from an SOP during procedure revision. OE 12628 identified that engineering personnel responsible for developing and maintaining the UFSAR, TS, and Accident Analysis Basis Document did not identify the requirement of SGBD isolation for the LONF and LOOP analysis. Omission of this information resulted in I&C and Operations personnel being unaware of assumptions credited in plant analysis.

An extent of condition review was conducted to identify other procedures (I&C and Operations) that reference use of the Rad Bypass switch at unacceptable times. The following procedures were identified: 1) 2-SOP-7.1 (SGBD Operations), 2) 2-SOP-1.11 (SG Filling, Wet Layup, Recirculation and Sparging), 3) 2-SOP-1.10 (SG Draining and dry Layup), 4) 2-PT-R141 (Phase A Testing), 5) 2-PC-2Y23-49 (Liquid Radiation Monitor Calibration), 6) 2-PC-Q76 (R-49 Channel Test), 7) 2-PT-M97 (R-49 source check), 8) 2-PT-Q70 (R-49 Flow Meters). The review determined only one procedure would provide an impact (2-PC-2Y23-49) which was revised. Procedure 2-SOP-7.1 manually isolates one SGBD line for sampling. Procedures 2-SOP-1.11, 2-SOP-1.10, and 2-PT-R141 are only performed in a plant mode that does not impact safety function (below 350 degrees F). The remaining procedures do not utilize Rad Bypass. Unit 3 had this condition identified in 2001 and corrected (LER-2001-001). Operating Event (OE) 12628 was issued for the unit 3 event and unit 2 incorporated lessons learned, which were subsequently undone.

The Cause of Event

The apparent cause was the inappropriate revision of test procedure 2-PC-2Y23-49 in 2002 that deleted information previously incorporated from an operating event at unit 3 that restricted when the blowdown radiation monitor could be tested. The procedure revision that deleted the restricting information for use of Rad Bypass had an inadequate review of the basis of the previous revision which incorporated an Operating Event (OE) for a Rad Bypass event at Unit 3 (OE 12628). The initial revision for the OE (Revision 2) restricted the use of Rad Bypass when testing Radiation Monitor R-49 (SGBD) to when reactor coolant system (RCS) is less than 350 degrees. The Rad Bypass switch position is designed to be able to momentarily reopen a blowdown line to obtain SG samples to monitor radiation activity in the SG in the event of a SG tube leak. For this event, Rad Bypass was improperly incorporated into a test of Radiation Monitor (RM) R-49 to preclude inadvertent closure of the blowdown line during testing which is an undesirable condition for chemistry sampling but not the purpose of the switch position.

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

Corrective Actions

The following corrective actions have been performed under the Corrective Action Program (CAP) to address the cause of this event.

- Procedure 2-PC-2Y23-49 was revised to delete steps to place in Rad Bypass while performing Radiation Monitor R-49 calibration and to install a test jumper to disable the blowdown function.
- The UFSAR will be revised to include the assumptions in the applicable accident analysis that SGBD isolation is assumed from event initiation.

Event Analysis

The event is reportable under 10CFR50.73(a)(2)(ii)(B) and 10CFR50.73(a)(2)(v). The licensee shall report any condition that resulted in: (B) The nuclear power plant being in an unanalyzed condition that significantly degraded plant safety, and any event or condition that could have prevented the fulfillment of the safety function of structures or systems that are needed to (B) Remove residual heat. This event meets the reporting criteria because placement of the switch for the SG Blowdown isolation valves in Rad Bypass defeated their Auto close function for degraded heat sink events (Loss of Normal Feedwater, Loss of All AC Power to Station Auxiliaries). Failure to close the SG blowdown isolation valves would result in inadequate maintenance of SG inventory because one motor driven Auxiliary Feedwater pump would not provide adequate flow with the blowdown isolation valves open. During the test, one motor driven AFWP was inoperable. These analyzed events assume SG blowdown isolation occurs and continuous SG blowdown during these events has not been analyzed. The condition was a safety system functional failure (SSFF) since during the test one motor driven AFWP was out of service resulting in inadequate maintenance of SG inventory. In accordance with reporting guidance in NUREG-1022, for a SSFF per 10CFR50.73(a)(2)(v), an additional random single failure need not be assumed during the condition.

Past Similar Events

A review was performed of the past three years of Licensee Event Reports (LERs) for events reporting control switches that could defeat or bypass automatic design features. No Unit 2 LERs were identified.

Safety Significance

This event had no significant effect on the health and safety of the public. There were no actual safety consequences for the event because there were no applicable accidents or transients (LONF or LOOP) during the time testing was performed by 2-PC-2Y23-49. For postulated events, the turbine driven AFWP was available and capable of providing feedwater flow to maintain SG inventory during the time testing was being performed with the SG blowdown isolation valve switches positioned in Rad Bypass. Administrative controls and instrumentation are available for operators to mitigate this condition. For the LONF or LOOP events, procedure 2-E-0 (Reactor Trip or Safety Injection) would be entered and transition to 2-ES-0.1 SG inventory will be impacted but plant procedure 2-ES-0.1 will ensure SG narrow range level is reestablished in all SGs to maintain symmetric cooling of the RCS. This procedure includes a step to verify that the SG blowdown isolation valves are closed. Additionally, SG blowdown is normally throttled by valve MS-71 to approximately 20 gpm even with the SG blowdown isolation valves open. During the January 19-27, 2011 testing per 2-PC-2Y23-49, SG blowdown was approximately 25 gpm per SG.