Entergy

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J. E. Pollock
Site Vice President

NL-09-096

July 27, 2009

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

SUBJECT: Licensee Event Report # 2009-003-00, "Loss of Single Train 21 Pressurizer Backup Heater Required for Remote Plant Shutdown from the Control Room Due to an Inoperable Breaker"
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) 2009-003-00. The attached LER identifies an event where the Technical Specification 3.3.4 Remote Shutdown safety function for single train 21 pressurizer backup heater was inoperable thereby not available for remote shutdown from the control room, which is reportable as a safety system functional failure under 10 CFR 50.73(a)(2)(v). This condition was recorded in the Entergy Corrective Action Program as Condition Report CR-IP2-2009-01965. An 8-hour notification under 10CFR50.72(b)(3)(v) should have been made but was not initially recognized as being required. CR-IP2-2009-02072 was recorded in the CAP for failure to make this notification.

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) 734-6710.

Sincerely,

JEP/cbr

cc: Mr. Samuel J Collins, Regional Administrator, NRC Region I
NRC Resident Inspector's Office, Indian Point 2
Mr. Paul Eddy, New York State Public Service Commission
LEREvents@inpo.org

JE22
NRR

NRC FORM 366 (9-2007) U.S. NUCLEAR REGULATORY COMMISSION

APPROVED BY OMB NO. 3150-0104 EXPIRES: 8/31/2010

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.

# LICENSEE EVENT REPORT (LER)

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

**4. TITLE:** Loss of Single Train 21 Pressurizer Backup Heater Required for Remote Shutdown From the Control Room Due to an Inoperable Breaker

| 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 |
| 5 | 28 | 2009 | 2009- | 003 - | 00 | 7 | 27 | 2009 | | 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)
- ☐ 20.2201(d)
- ☐ 20.2203(a)(1)
- ☐ 20.2203(a)(2)(i)
- ☐ 20.2203(a)(2)(ii)
- ☐ 20.2203(a)(2)(iii)
- ☐ 20.2203(a)(2)(iv)
- ☐ 20.2203(a)(2)(v)
- ☐ 20.2203(a)(2)(vi)
- ☐ 20.2203(a)(3)(i)
- ☐ 20.2203(a)(3)(ii)
- ☐ 20.2203(a)(4)
- ☐ 50.36(c)(1)(i)(A)
- ☐ 50.36(c)(1)(ii)(A)
- ☐ 50.36(c)(2)
- ☐ 50.46(a)(3)(ii)
- ☐ 50.73(a)(2)(i)(A)
- ☐ 50.73(a)(2)(i)(B)
- ☐ 50.73(a)(2)(i)(C)
- ☐ 50.73(a)(2)(ii)(A)
- ☐ 50.73(a)(2)(ii)(B)
- ☐ 50.73(a)(2)(iii)
- ☐ 50.73(a)(2)(iv)(A)
- ☒ 50.73(a)(2)(v)(A)
- ☐ 50.73(a)(2)(v)(B)
- ☐ 50.73(a)(2)(v)(C)
- ☐ 50.73(a)(2)(v)(D)
- ☐ 50.73(a)(2)(vii)
- ☐ 50.73(a)(2)(viii)(A)
- ☐ 50.73(a)(2)(viii)(B)
- ☐ 50.73(a)(2)(ix)(A)
- ☐ 50.73(a)(2)(x)
- ☐ 73.71(a)(4)
- ☐ 73.71(a)(5)
- ☐ OTHER

Specify in Abstract below or in NRC Form 366A

**12. LICENSEE CONTACT FOR THIS LER**

| NAME | TELEPHONE NUMBER *(Include Area Code)* |
|---|---|
| James Timone, Component Engineer | (914) 734-6733 |

**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 | HS | F180 | Y | x | ED | BKR | W121 | 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 May 28, 2009, after completion of quarterly surveillance 2-PT-Q54, "Pressurizer Level Bistable Test," and return of the Pressurizer Level Defeat switch (L-460A) to its original position, control room (CR) alarm (Pressurizer Low Level 18% and 5%) came in and cleared, and (Pressurizer Heater Group Tripped) alarmed due to the trip of Pressurizer Heater Group 21 and the Modulating Heater Group. The breakers for these components opened and Operators attempted to reclose the breakers but were unable to re-close the breaker for the 21 pressurizer backup (B/U) heater. Operators were able to close the breaker for the 22 pressurizer B/U heater and re-close the breaker for the modulating heaters. Technical Specification (TS) 3.3.4.A (Remote Shutdown) was entered for an inoperable 21 pressurizer backup (B/U) heater. Troubleshooting was initiated and the anti pump lever for the 21 pressurizer B/U heater breaker was manually reset and the breaker closed. The apparent cause of the trip of the pressurizer heaters was a degraded switch (L-460A) where a dead spot caused an intermittent interruption of continuity when the switch was rotated to the Defeat 3 position. The interruption disrupted the input to pressurizer level bistables and momentarily actuated the bistables causing the alarm and trip of the breakers for the pressurizer heaters. The inability to reset and re-close the breaker for the 21 pressurizer B/U heater was due to a misaligned control relay trip (anti-pump) lever. Corrective actions included troubleshooting breaker 52/PBU1, realignment of the anti pump lever, testing, breaker cycling and closure. Switch L-460A and the control relay will be replaced and the cubicle rail for the breaker (52/PBU1) will be repaired. 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 2 | 05000-247 | 2009 | - 003 | - 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 May 28, 2009, while at 100% steady state reactor power, at approximately 9:24 hours, control room (CR) alarm (Pressurizer Low Level 18% and 5%) {IB} came in and cleared, and (Pressurizer Heater Group Tripped) alarmed {IB} due to the trip of Pressurizer Heater Group 21 {AB} and Modulating Heater Group {AB} after completion of quarterly surveillance 2-PT-Q54 (Pressurizer Level Bistable Test), and return of the Pressurizer Level Defeat switch (L-460A) {HS} to its original position. At 9:28 hours, Operators attempted to restore pressurizer B/U heater group 21 but were unable to re-energize the 21 pressurizer backup (B/U) heater from the control room. CR Operators were able to reset and energize the 22 pressurizer B/U heaters and place the Modulating Heater Group in service. At approximately 9:30 hours, Technical Specification (TS) 3.3.4.A (Remote Shutdown) was entered for an inoperable 21 pressurizer backup (B/U) heater. TS 3.3.4 (Remote Shutdown Instrumentation) Limiting Condition for Operation (LCO), Remote Shutdown Function is required to be operable in Modes 1, 2 and 3. TS 3.3.4 Condition A, One or more functions inoperable, Required Action A, requires the functions to be restored to operable status within 30 days. TS 3.3.4 Basis (Remote Shutdown) Table B 3.3.4-1 function 2.a, requires an operable 21 pressurizer B/U heater local/remote transfer switch for reactor coolant system (RCS) pressure control. Troubleshooting was performed on the 21 pressurizer B/U heater breaker (52/PBU1) {BKR}, and the breaker closed after its anti pump lever was realigned and testing was satisfactorily completed. On May 28, 2009, at approximately 11:00 hours, the 21 pressurizer B/U heater was declared operable and TS 3.3.4 Condition A exited. The condition was recorded in the Indian Point Energy Center (IPEC) Corrective Action Program (CAP) as CR-IP2-2009-01965.

The Control Room (CR) is designed for an unlikely event that the CR becomes inaccessible and operators are required to establish control and shutdown the plant remote from the CR. This event is not an analyzed event in UFSAR Chapter 14 (Accident Analysis). The remote shutdown function provides designated equipment at appropriate locations outside the CR with the capability to shut down and maintain the unit in a safe condition in Mode 3. The remote shutdown TS LCO provides the operability requirements of the instrumentation and controls necessary to place and maintain the unit in Mode 3 from a location other than the CR. The instrumentation and controls are identified in TS Basis Table B 3.3.4-1 to include the single train 21 pressurizer B/U heater local/remote transfer switch. Although the instrumentation and control was functioning, the function of RCS pressure control was inoperable with the breaker for the 21 pressurizer B/U heater unable to close. The pressurizer level defeat switch (L/460A) is a manual mechanical selector switch {HS} manufactured by Foxboro {F180}. The 21 pressurizer B/U heater breaker (52/PBU1) is a 480 Volt AC {ED} breaker Model DB-50 manufactured by Westinghouse {W121}. The breaker anti pump lever is part of the breaker control relay assembly {RLY}. The control relay assembly is a 125 volt DC component manufactured by Westinghouse {121}.

Cause of Event

The apparent cause of the pressurizer heaters tripping was attributed to a degraded Pressureizer Level Defeat switch (L-460A) where a dead spot caused an intermittent interruption of continuity when the switch was rotated to the Defeat 3 position. The interruption would disrupt the input to pressurizer level bistables [2LC-459C/D (pressurizer level alarm with heaters off), and 2LC-459E/F (pressurizer level alarm with heaters on)] and momentarily simulate a downscale pressurizer level and thereby actuate the bistables causing the alarm and trip of the operating pressurizer heaters.

The breaker (52/PBU1) for the 21 pressurizer backup (B/U) heater opened as designed as a result of pressurizer level bistable trip signals. The condition of the breaker and bistables tripped resulted in the actuation of the breaker control relay assembly anti pump lever. Control Room Operators attempted to re-set and close the breaker to energize the 21 pressurizer (B/U) heater by positioning the Control Room switch to trip which resets the breaker control relay trip lever from the anti-pump position. The switch was then taken to close but because the control relay trip lever (anti-pump) was misaligned, it remained in the anti-pump position and the breaker (52/PBU1) could not be closed. The cause of the breaker anti pump lever misalignment was indeterminate. Inspection of the breaker cubicle discovered a broken rail rack pin which would cause difficulty racking in the breaker. It is likely that because the breaker had become difficult to rack-in due to the broken cubicle rail pin the control relay trip lever (anti-pump) may have been nudged during a previous breaker rack-in. Because the control relay lever is in an exposed/unprotected location it could have been misaligned during the last breaker rack-in. Manipulating the test switch (L-460A) during troubleshooting cleared the switch condition.

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:

- Performed troubleshooting on the 21 pressurizer backup (B/U) heater breaker 52/PBU1, and repair of the breaker control relay trip (anti-pump) lever; Post Maintenance Testing included cycling the breaker open/closed.
- Pressurizer Level Defeat Switch L-460A and the control relay for breaker 52/PBU1 will be replaced and the breaker cubicle rail repaired. Scheduling of these activities in the 12 week Work Control process will be completed by August 5, 2009.

Event Analysis

The event is reportable under 10CFR50.73(a)(2)(v), "Any event or condition that could have prevented the fulfillment of the safety function of structures or systems that are needed to: (A) shut down the reactor and maintain it in a safe shutdown condition." On May 28, 2009, at approximately at 9:28 hours, operations entered TS 3.3.4 Condition A for an inoperable 21 pressurizer B/U heater. The inoperability of the breaker for the 21 pressurizer backup heater was recognized as preventing the Technical Specification 3.3.4 (Remote Shutdown) function (TS Basis Table 3.3.4-1, Function 2.a, 21 Pressurizer Backup Heater Local/Remote Transfer Switch) for reactor coolant system pressure control. However, operations did not recognize the condition was a safety system functional failure and failed to make the 8-hour non-emergency notification under 10CFR50.72(b)(3)(v)to the NRC. The failure to make an 8-hour notification was recorded in the CAP as CR-IP2-2009-02072. TS 3.3.4 Basis (Remote Shutdown) Table B3.3.4-1 function 2.a requires an operable 21 pressurizer B/U heater local/remote transfer switch for reactor coolant system pressure control. The inoperable single train 21 pressurizer B/U heater resulted in a safety system functional failure.

| FACILITY NAME (1) | DOCKET (2) | LER NUMBER (6) | | | PAGE (3) |
|---|---|---|---|---|---|
| | | YEAR | SEQUENTIAL NUMBER | REVISION NUMBER | |
| Indian Point Unit 2 | 05000-247 | 2009 | - 003 - | 00 | 4 OF 4 |

**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 that involved inoperable remote shutdown functions. No unit 2 LERs were identified. However, unit 3 reported in LER-2008-002 a similar loss of their single train 31 pressurizer heater. The unit 3 event was a different cause as that event was due to a failed pressurizer heater transformer.

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 transients requiring shutdown outside the CR. Shutdown outside the CR could also be accomplished with one of the remaining pressurizer heaters through use of local breaker operation or without the use of the heaters. Operation of the 21 pressurizer B/U heater breaker from the remote shutdown switch would have operated prior to the surveillance testing as the test switch (L-460A) is not part of the actuating circuit. The protective function of the circuit would have operated properly. The condition resulted during surveillance testing of pressurizer level bistables. In accordance with NUREG-0800, Section 7.4, shutdown remote from the CR is not an event analyzed in the USFAR for accident analysis (Chapter 14). Specific scenarios are not specified on which the adequacy of shutdown capability remote from the CR is evaluated. A recognized type of event that could force the evacuation of the CR and the need to shut down remote from the CR is smoke from a fire. Fire damage limits as they impact safe shutdown do not require consideration of an additional random single failure in the capability to safely shut down. Therefore, application of single failure to remote shutdown is applicable only to other events that could cause the CR to become uninhabitable. These events would not result in consequential damage or unavailability of systems required for safe shutdown.