Entergy

Indian Point Energy Center
450 Broadway, GSB
P.O. Box 249
Buchanan, N.Y. 10511-0249
Tel (914) 734-6700

Fred Dacimo
Site Vice President
Administration

February 14, 2006
Indian Point Unit No. 2
Docket No. 50-247
NL-06-019

Document Control Desk
U.S. Nuclear Regulatory Commission
Mail Stop O-P1-17
Washington, DC 20555-0001

Subject: Licensee Event Report # 2005-004-00, "Automatic Start of Both Motor Driven Auxiliary Feedwater Pumps Due to 22 Steam Generator High-High Level Signal Caused by Personnel Error."

Dear Sir:

The attached Licensee Event Report (LER) 2005-004-00 is the follow-up written report submitted in accordance with 10 CFR 50.73. This event is of the type defined in 10 CFR 50.73(a)(2)(iv)(A) for an event recorded in the Entergy corrective action process as Condition Report CR-IP2-2005-05252.

There are no commitments contained in this letter. Should you or your staff have any questions regarding this matter, please contact Mr. Patric W. Conroy, Manager, Licensing, Indian Point Energy Center at (914) 734-6668.

Sincerely,

for

Fred R. Dacimo
Site Vice President
Indian Point Energy Center

IE22

Attachment: LER-2005-004-00

cc:

Mr. Samuel J. Collins
Regional Administrator – Region I
U.S. Nuclear Regulatory Commission

U.S. Nuclear Regulatory Commission
Resident Inspector's Office
Resident Inspector Indian Point Unit 2

Mr. Paul Eddy
State of New York Public Service Commission

INPO Record Center

NRC FORM 366 (6-2004)

U.S. NUCLEAR REGULATORY COMMISSION

APPROVED BY OMB NO. 3150-0104 EXPIRES: 06/30/2007

LICENSEE EVENT REPORT (LER)

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

4. TITLE: Automatic Start of both Motor Driven Auxiliary Feedwater Pumps Due to 22 Steam Generator High-High Level Signal Caused by Overfeeding Due to Personnel Error

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 05000
12	22	2005	2005 -	004 -	00	2	14	2006	FACILITY NAME	DOCKET NUMBER 05000

9. OPERATING MODE: 2

10. POWER LEVEL: 3%

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)*
Peter Schoen, Assistant Operations Manager, Unit 2	(914) 734-8178

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

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 December 22, 2005, while offline for maintenance, at approximately 0550 hours, both motor driven Auxiliary Feedwater pumps (AFWPs) received an automatic actuation signal to start. Both AFWPs were in service at the time feeding the SGs with the 22 Main Boiler Feedwater Pump (MBFP) on turning gear and the 21 MBFP isolated and in recirculation. A 22 SG High-High Level signal resulted in tripping the 21 MBFP which by design initiates start of the AFWPs. The Reactor Operator (RO) assigned to feed water control failed to adequately monitor SG level and overfed the 22 SG. The RO had decreased AFW flow instead of stopping AFW flow as intended. The RO failed to adequately monitor SG levels, check his actions or request a peer check. Operators restored the 22 SG level to normal. The apparent cause was personnel error due to failure to perform self checking, and failure to monitor alternate SG level indications to ensure appropriate SG levels. Corrective actions include, administrative removal of the RO from licensed duties, simulator testing and evaluation and return to duty, coaching the RO on use of human performance tools, issuing a Station Clock Reset/Red Memo for this event as well as others for the shutdown to advise personnel of the event and lessons learned and convey management's expectations on use of human performance tools. 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	2005	- 004	- 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 brackets { }

DESCRIPTION OF EVENT

On December 22, 2005, while maintaining the plant at approximately 3% power during a plant shutdown to repair a packing leak on the 24 Steam Generator (SG) Feedwater Regulating Valve {FCV}, at approximately 0550 hours, a High-High water level FW isolation signal {JB} was initiated at 73% water level for the 22 Steam Generator (SG) {AB}. High level (73%) on two of three level transmitters {LT} on any SG results in a main turbine trip, automatic closure of the main and low flow FW regulating valves {FCV}, and closure of the Main Boiler Feedwater Pump (MBFP) {SJ} discharge valves. Closure of the MBFP discharge valves causes a trip of both MBFPs {SJ} and closure of all eight FW stop valves although only the main FW line stop valves are credited in the accident analysis for closing. A trip actuation signal for the MBFPs initiates the start of both motor driven Auxiliary Feedwater (AFW) {BA} Pumps (21 AFWP and 23 AFWP). Each AFWP supplies two SGs. AFWP 21 delivers FW to SG-21 and SG-22 through valves FCV-406A and B. AFWP-23 delivers FW to SG-23 and SG-24 through valves FCV-406C and D. Although the AFWPs received an actuation signal to start, the AFWPs had been started at approximately 0523 hours, and operating in support of the maintenance outage. The 22 MBFP was shutdown, isolated and had been placed on turning gear at approximately 0255 hours. The 21 MBFP was isolated but operating in recirculation mode. The Main Turbine-Generator had been tripped at 0513 hours, in support of the maintenance outage. On December 22, 2005, at 1208 hours, an eight hour non-emergency notification was made to the NRC (Log Number 42220) for a valid actuation of the AFW system under 10CFR50.72(b)(3)(iv)(A). The event was recorded in the Indian Point Energy Center corrective action program (CAP) as CR-IP2-2005-05252.

On December 21, 2005, the valve packing for SG FCV-447 was found to be leaking. Maintenance attempted to adjust the packing for the valve but was unsuccessful. Management decided to commence a power reduction in order to repair the valve packing. On December 22, at approximately 0025 hours, a down power commenced to 3% power to facilitate repacking FCV-447. During the maintenance shutdown, the reactor operator (RO) assigned FW control/SG level failed to check his actions when FW flow to the 22 SG was decreased. The RO observed the 22 SG water level rising but thought he had stopped AFW flow to the 22 SG. However, AFW flow was not completely isolated as intended and continued to supply AFW to the 22 SG at approximately 40 gpm. The RO then realized that the 22 SG water was still rising after observing 22 SG level at approximately 65%. The RO rechecked AFW flow control and discovered AFW flow to 22 SG was not completely shut off as intended and was still feeding the 22 SG. The RO closed the AFW flow control valve and informed the Control Room Supervisor (CRS) of the high level.

FACILITY NAME (1)	DOCKET (2)	LER NUMBER (6)			PAGE (3)
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	
Indian Point Unit 2	05000-247	2005	- 004	- 00	3 OF 4

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

However, the cold AFW addition near the High-High level setpoint heated and expanded in the SG and exceeded the 73% level FW isolation setpoint initiating FW isolation and the resultant MBFP trip and AFW actuation. Operations returned the 22 SG water level to the proper level.

CAUSE OF EVENT

The cause of the AFW pump actuation was an actuation signal from the MBFP trip circuit as a result of MBFP Overspeed trip actuation caused by a FW isolation signal due to High-High 22 SG level (73%). The High-High 22 SG level was the result of overfeeding the 22 SG. The apparent cause of overfeeding the 22 SG was human error as a result of inadequate error detection practices. Self checking was not applied to ensure the expected response. The RO responsible for monitoring and controlling SG levels did not verify the expected response after closing the control valve for AFW supply to the 22 SG. The RO failed to monitor important system parameters and compare alternate indications. Alternate indications (e.g., flow indicator, computer, level trend recorder) were not checked to ensure flow was stopped. Contributing causes were: CC-1: error detection practices, other intended or required verification was not performed. The RO controlling SG levels did not obtain a peer check when closing the AFW supply valve for the 22 SG. This is an expectation when manipulating plant components where adverse consequences can result from improper performance. CC-2: Ineffective oversight/command and control. Supervisors did not reinforce expectations for using human performance tools (self checking/peer checking) and monitoring of important parameters.

CORRECTIVE ACTIONS

The following corrective actions have been or will be performed under the CAP to address the causes of this event and prevent recurrence.

- The RO was administratively removed from licensed duties. The RO was simulator tested and evaluated and no issues were identified. The RO returned to licensed duty.
- The RO received documented coaching as to management's expectations on the use of human performance tools and the need to perform self checking and peer checking.
- A Station Clock Reset and Red Memo was issued to site personnel due to this event as well as others during this shutdown to advise site personnel of the event and lessons learned and convey management's expectations on use of human performance tools (i.e., self-checking, peer checking, questioning attitude).
- The INPO AFI Action Plan (CR-IP2-2005-03898) will be revised to place added focus in the areas of monitoring of important process parameters and using alternate indications to confirm system status; use of self checking and peer checking during component manipulations, effectively implementing procedures, exercising effective oversight, and command and control.

FACILITY NAME (1)	DOCKET (2)	LER NUMBER (6)			PAGE (3)
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	
Indian Point Unit 2	05000-247	2005	- 004	- 00	4 of 4

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

EVENT ANALYSIS

The event is reportable under 10CFR50.73(a)(2)(iv)(A). The licensee shall report any event or condition that resulted in manual or automatic actuation of any of the systems listed under 10CFR50.73(a)(2)(iv)(B). Systems to which the requirements of 10CFR50.73(a)(2)(iv)(A) apply for this event include the AFWS. This event meets the reporting criteria because a start signal was initiated for the AFWS in accordance with design as a result of the 22 SG High-High level signal.

PAST SIMILAR EVENTS

A review of the past two years of Licensee Event Reports (LERs) for events that involved an AFWS actuation as a result of high SG level identified one LER. LER-2004-001 reported a High-High level signal due to overfeeding the 22 SG as a result of a failure of Main Feedwater Regulating valve (FCV-427) to fully close. The AFWPs had already been started due to a low SG level signal as a result of a manual reactor trip. The event reported in LER-2004-001 did not have the same cause (stuck valve) as this event (operator error), therefore the corrective actions for the event reported in LER-2004-001 would not have prevented this event

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 transients or accidents during the time of the event. Both AFWPs were operating and providing adequate FW flow to the SGs. Operators had alarms/indications alerting them to high SG level and procedures to direct proper actions. Operators during this event recognized the 22 SG overfeed condition and took actions in accordance with plant procedures.

There were no significant potential safety consequences of this event under reasonable and credible alternative conditions. Excess FW addition at full power would cause a greater load demand on the reactor coolant system (RCS) due to increased subcooling in the SGs. A failure of operators to recognize the AFW pump operation could result in excess FW flow. The addition of cold FW would cause a decrease in RCS temperature and a consequential positive reactivity insertion due to the effects of negative moderator coefficient of reactivity. Continuous excessive FW addition would be terminated by an automatic FW isolation actuated upon receipt of a SG High-High level water signal. The SG high-high water level signal also results in a turbine trip and subsequent reactor trip. Excessive FW addition transients at power are attenuated by the thermal capacity of the secondary plant and of the RCS. The reactor protection system overpower and overtemperature delta temperature trips and the high neutron flux trip prevent any power increase that could lead to a departure from nucleate boiling ratio (DNBR) less than the applicable DNBR limit.
This event was bounded by the analyzed event described in FSAR Section 14.1.10, Excessive heat removal due to a FW system malfunction. The plant performed as expected and the event was bounded by the FSAR analysis. For this event the AFWS actuated as designed and operators were alerted to the high SG condition to perform corrective action in accordance with plant procedures.