Entergy

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Fred Dacimo
Site Vice President
Administration

February 14, 2006
Indian Point Unit No. 2
Docket No. 50-247
NL-06-018

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

Subject: Licensee Event Report # 2005-003-00, "Automatic Start of Both Motor Driven Auxiliary Feedwater Pumps Due to Trip of 22 Main Feedwater Pump Caused by Low Lube Oil Pressure Due to an Inadequate Procedure."

Dear Sir:

The attached Licensee Event Report (LER) 2005-003-00 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 CR-IP2-2005-05245.

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-2005-003-00

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

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
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4. TITLE: Automatic Start of Both Motor Driven Auxiliary Feedwater Pumps Due to Trip of 22 Main Feedwater Pump Caused by Low Lube Oil Pressure Due to an Inadequate Procedure

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
12	22	2005	2005 -	003 -	00	2	14	2006		05000
									FACILITY NAME	DOCKET NUMBER
										05000

9. OPERATING MODE

1

10. POWER LEVEL

67%

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)*
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
D	SL	HX	A310	N	X	KG	HCV	V085	N

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 performing a plant shutdown, the 22 Main Boiler Feedwater Pump (MBFP) tripped on low lube oil (LO) pressure initiating the automatic start of both motor driven Auxiliary Feedwater (AFW) pumps. The 22 MBFP tripped while operators attempted to swap the 21 LO cooler to the 22 LO cooler. Swapping to the 22 LO cooler was required because a service water control valve was not maintaining proper LO temperature. The most probable cause is that the MBFP LO experienced a pressure drop due to air in the 22 LO cooler oil side which had not been adequately vented prior to the swap. Operators stabilized SG level and secured both motor driven AFW pumps and returned them to Auto. The apparent cause was inadequate procedure guidance for filling and venting the LO coolers. Corrective actions will be to revise the System Operating Procedure for the LO coolers to provide detailed fill and vent instructions, and preparation of a refueling outage activity for inclusion in the outage schedule to fill and vent LO coolers prior to MBFP start. The event had no 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 brackets { }

DESCRIPTION OF EVENT

On December 22, 2005, with the plant at approximately 67% power, while performing a plant shutdown to repair a packing leak on the 24 Steam Generator (SG) Feed Regulating Valve {FCV} {SJ}, the 22 Main Boiler Feedwater Pump (MBFP) {SJ} tripped {JK}, at approximately 0208 hours, on low lube oil (LO) pressure initiating the automatic start of both motor driven Auxiliary Feedwater (AFW) {BA} pumps (AFWP-21 and AFWP-23). The 22 MBFP tripped while operators attempted to swap the in-service 21 LO cooler {HX} for the standby 22 LO cooler. Operations stabilized SG levels and restored them to normal. At approximately 0218 hours, Operators secured the 21 and 23 AFWP and returned them to Auto. The 22 MBFP was placed on turning gear at 0255 hours. The following significant equipment did not perform as expected as a result of the MBFP trip: the 22 Condensate Pump {SD} auto started as designed but after running with no FW load, the lower radial bearing temperature exceeded the Alarm Response Procedure (ARP) action limit of 200 degrees F; the Heater Drain Tank Pump (HDTP) {SM} flows oscillated and the 21 HDTP tripped when performing the procedure to remove the 22 HDTP from service. The Operators continued plant shutdown and at 0513 hours tripped the main turbine {TA} and at 0523 hours placed the 21 and 23 AFWP in service. The 21 MBFP was configured to recirculation mode. The plant was maintained at approximately 3% power while the 24 SG Regulating Valve was repaired. On December 22, 2005, at 0320 hours, an eight hour non-emergency notification was made to the NRC (Log Number 42217) 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-IP2-2005-05245.

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 down power, at approximately 0145 hours, a Nuclear Plant operator (NPO) reported to the Control Room (CR) that the MBFP LO cooler outlet temperature had declined to approximately 92 degrees with a procedure limit of 90 degrees. The Control Room Supervisor (CRS) decided to transfer the MBFP LO coolers due to the problem of controlling LO temperature for the 22 MBFP (the likelihood of having to perform this evolution had been discussed at the Start of Watch meeting).

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

MBFP bearing lube oil is supplied by a high pressure oil header whose oil is cooled by one of two oil coolers that use SW as a cooling medium. The amount of SW circulated through the oil coolers is regulated to maintain the temperature of the oil leaving the bearings. There are two main oil pumps with only one main oil pump needed to supply the requirements of both MBFPs and turbines. Each main oil pump takes suction from the turbine oil reservoir and discharges to a high pressure header which supplies the bearings at a reduced pressure.

Low bearing oil pressure for the MBFP actuates the MBFP overspeed trip mechanism and allows the auto stop oil to drain when the trip point is reached. The loss of Autostop oil pressure results in the closure of the MBFP stop and governor valves. There is also an electrical trip, which utilizes three pressure switches to monitor bearing oil pressure. When any 2 out of 3 pressure switches detect bearing oil pressure at or below the setpoint, the 2/3 logic will trip the solenoid trip valves. The AFWPs automatically start when either MBFP (21 MBFP or 22 MBFP) is automatically tripped. The MBFP Turbine LO coolers {SL} are ITT water cooled 2 pass heat exchangers {HX}, Type CPK, originally manufactured by American Standard {A310}. The 21 LO cooler SW inlet valve SWT-16 is a 3 inch globe valve {HCV}, manufactured by Velan Valve Corporation {V085}, Model Number F10-0074C-02TY.

The inability to control MBFP LO temperature was due to a failed Service Water (SW) {KG} valve (SWT-16 was mechanically stuck in position) used to throttle SW to the in-service LO cooler (LO cooler 21). Conventional Operator Rounds specify 90 degrees F as the minimum LO cooler discharge temperature. Main FW System Operating Procedure (SOP) 21.1, Precautions and limitation state, "do not roll up a MBFP unless oil temperature exceeds 90 degrees F." LO cooler SOP (SOP-21.4) requires outlet LO temperature to be maintained between 110 to 120 degrees F. Operations was concerned about the effects of LO temperature on MBFP operation and decided to transfer LO coolers when the temperature reached 92 degrees F. Adjustment of the LO cooler SW supply valve was inadequate due to the valve's degraded condition. The 22 LO cooler had been worked on previously while on-line, therefore it was necessary to ensure it was properly filled and vented prior to placing it in service. Prior to the transfer to the standby 22 LO cooler, Nuclear Plant Operators (NPOs), using SOP-21.4, verified the LO cooler was full using a LO cooler site flow indicator. Additionally, NPOs checked the LO cooler vent line for temperature noting it was warm thereby providing an indication that warm oil flowed through the LO heat exchanger to its over flow. NPO's believed this indication further confirmed the LO cooler was full. While attempting to transfer LO coolers, the LO pressure to the MBFP bearings declined and reached the low pressure trip limit causing the 22 MBFP to trip as designed. On December 22, 2005, at approximately 0208 hours, the Control Room received a 22 MBFP Bearing Oil Low Pressure alarm and annunciation of a subsequent trip of the 22 MBFP.

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

CAUSE OF EVENT

The cause of the AFWP actuation and start was an actuation signal as a result of MBFP Overspeed trip actuation on low LO bearing pressure. The low LO bearing pressure was caused by a pressure drop during transfer from 21 LO oil cooler to 22 LO cooler. The apparent cause was procedure inadequacies (AC-1). AC-1: LO cooler SOP-21.4 does not provide detailed instructions for filling and venting. The NPOs checked if the standby LO cooler was filled by observing oil in the cooler sight glass but did not adequately fill and vent the cooler prior to use.

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.

- Procedure 2-SOP-21.4,"Main Boiler Feed Pump Lube Oil System," will be revised to provide detailed instructions for filling and venting a standby LO cooler to include the proper method to adequately vent to preclude air pockets. Revision of SOP-21.4 is scheduled for April 5, 2006.
- A refueling outage activity will be developed to include within the outage schedule a task to fill and vent the MBFP LO coolers prior to initial MBFP start. The outage activity will be developed and included in the outage schedule by April 10, 2006.

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 the AFWS was actuated in accordance with design as a result of a MBFP trip.

PAST SIMILAR EVENTS

A review of the past two years of Licensee Event Reports (LERs) for events that involved an ESF actuation identified one LER. LER-2004-004 reported actuation of two of three Emergency Diesel Generators (EDGs) due to loss of power to the safeguards bus after a tie breaker was used to tie two of three safeguards buses. The cause of the loss of bus power was missing tie breaker primary disconnects. The cause of the missing breaker disconnects were due to inadequate work practices, self-checking, use of human performance tools, lack of an adequate questioning attitude with a contributing cause of inadequate procedures. The cause of this LER is similar in that there were inadequate procedures and human performance failures. However, the corrective actions for this previous event were for the Maintenance Department and the current event involved Operations personnel therefore those corrective actions for Maintenance personnel 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 the SGs had adequate FW flow with the remaining MBFP to maintain SG water level. Operators had alarms/indications alerting them to AFW pump start and procedures to direct proper actions. Operators during this event **recognized the AFW pump start and** took appropriate actions in accordance with plant procedures. The AFPs were secured after the MBFP trip and FW flow maintained with the remaining 21 MBFP.

There were no significant potential safety consequences of this event under reasonable and credible alternative conditions. A failure of operators to recognize the AFW pump operation could result in excess FW flow. 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. 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 condition to perform actions in accordance with plant procedures.