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NL-14-036

April 7, 2014

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

SUBJECT: Licensee Event Report # 2014-003-00, "Automatic Actuation of the Turbine Driven Auxiliary Feedwater Pump Following Testing of the 31 Emergency Diesel Generator Due to Non-SI Blackout Logic Defeated Reset"
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) 2014-003-00. The attached LER identifies an event or condition that resulted in manual or automatic actuation of any of the systems listed in 10 CFR 50.73(a)(2)(iv)(B), which is reportable under 10 CFR 50.73(a)(2)(iv)(A). This condition was recorded in the Entergy Corrective Action Program as Condition Report CR-IP3-2014-00368.

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,

A handwritten signature in black ink, appearing to read "JAV for".

JAV/cbr

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

Handwritten initials in black ink, appearing to read "LE22" over "NRR".

LICENSEE EVENT REPORT (LER)

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-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 3

2. DOCKET NUMBER
05000-286

3. PAGE
1 OF 5

4. TITLE: Automatic Actuation of the Turbine Driven Auxiliary Feedwater Pump following Testing of the 31 Emergency Diesel Generator Due to Non-SI Blackout Logic Defeated Reset

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
2	06	2014	2014	003	00	4	07	2014		05000
									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)										
	<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)							
10. POWER LEVEL 100%	<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 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 checked="" 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 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 Michael Tesoriero, Manager, Engineering Systems	TELEPHONE NUMBER (Include Area Code) (914) 254-7159
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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
X	EK	HIS	H260	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 February 6, 2014, the 32 Turbine Driven Auxiliary Feedwater Pump (AFWP) unexpectedly automatically actuated and started coincident with opening the 31 Emergency Diesel Generator (EDG) output breaker during performance of monthly functional test 3PT-M79A (31 EDG Functional Test). When the 31 EDG breaker was opened, the Non-Safety Injection (SI) Blackout Logic Defeated relay reset itself without operator actions. Normally the Non-Safety Injection (SI) Blackout Logic Defeated circuitry prevents automatic starting of equipment until manually reset. Operators verified the 32 AFWP was not required and restored the 32 AFWP to standby. The cause of the auto AFWP start was the Non-SI Blackout Logic Defeated reset pushbutton was stuck in the depressed position (open contacts). The failure was a degraded switch that created an open circuit in the Non-SI Blackout Logic Defeated reset circuit preventing relay 3-5/2A from properly sealing in and defeating the Non-SI Blackout relays (3-2/2A and 3-2/3A) functions when the 31 EDG output breaker was manually opened. Corrective action was replacement of the pushbutton. The event had no effect on public health and safety.

LICENSEE EVENT REPORT (LER)

FACILITY NAME (1)	DOCKET (2)	LER NUMBER (6)			PAGE (3)
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	
Indian Point Unit 3	05000-286	2014	- 003	- 00	2 OF 5

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 February 6, 2014, while at 100 percent steady state reactor power, at approximately 15:53 hours, the Control Room (CR) {VI} Operators observed a "Non-Safety Injection (SI) Blackout Logic Defeated" alarm {PA} clear, reset push-button {HIS} light {IL} on, the "Auxiliary Boiler Feedwater (ABFW) {BA} pump {P} 32 Steam Supply Low Pressure" alarm {PA} clear, and 32 ABFW pump RPMs increasing during performance of a monthly functional test (3PT-M79A) of the 31 Emergency Diesel Generator (EDG) {EK}. The clearing of the "Non-SI Blackout Logic Defeated" alarm was not expected at the time of the test since the reset push-button had not been pushed. The EDG functional test closes and opens the EDG output breaker {BRK} via a breaker control switch, connecting and disconnecting the 31 EDG to 480 Volt AC Bus 2A/3A. The ABFW Pump start logic {JE} is defeated during this test. The "Steam Supply Low Pressure" alarm is normally locked-in (Green) when the 32 ABFW pump is not in service. The clearing of the "Steam Supply Low Pressure" alarm alerted operators to an automatic start of the turbine driven pump. Operations determined that there were no plant conditions requiring operation of the 32 ABFW pump. The 32 ABFW pump was shutdown at approximately 16:08 hours, and placed in standby at approximately 16:10 hours. The 31 EDG was shutdown and its control switch was placed in "Auto" at approximately 16:02 hours. The event was recorded in the Indian Point Energy Center corrective action program (CAP) as CR-IP3-2014-00368.

Operations initiated an investigation into the cause of the event. The 32 ABFW pump auto-started after the 31 EDG output breaker to 480 Volt AC {ED} Bus 2A/3A was manually opened. Auxiliary Feedwater (AFW) from the 32 ABFW pump did not flow to the steam generators (SG) due to the normally closed condition of manually operated Flow Control Valves {FCV} (BFD-FCV-405A,B,C,D). An assessment by Instrumentation and Controls (I&C) verified that no unexpected alarms were received, and that no other actuation or trips were initiated. I&C and Operations verified that none of the conditions that automatically actuate the 32 ABFW pump (Non-SI Blackout signal, a Low-Low level in two of the four SGs, or AMSAC signal) were present during the time the 32 ABFW pump auto-started and ruled out these scenarios. In response to a request by Operations, Engineering performed an Operability Evaluation (OE) concluding that the 32 ABFW pump was operable with compensatory measures required to maintain operability. The OE determined that resetting SI after a loss of offsite power (LOOP) and SI actuation will cause the 32 component cooling water pump (CCW) and 32 ABFW to auto start. The 32 ABFP does not have a timer and auto started when the start logic was made up. The 32 CCW pump did not auto start as it has a timer and it had not run down before the EDG output breaker was opened. The 32 CCW pump was secured and placed in Trip Pull Out (TPO) to prevent unnecessary loading onto the EDG. An existing approved calculation demonstrates that the additional load on the 31 EDG imposed by the 32 CCW pump auto starting is within current safety analysis. Starting of the 32 ABFP is acceptable as it will stay in idle, its discharge flow control valves are closed and it will draw a minimum amount of steam.

The 480 volt AC Electrical Distribution System {ED} contains three safeguards power trains. The three safeguards power trains are train 5A (480 volt bus 5A and associated EDG-33), train 6A (480 volt bus 6A and associated EDG-32), and train 2A/3A (480 volt buses 2A and 3A and associated EDG-31). 480 volt safety buses (5A, 6A, 2A and 3A) and associated switchgear {SWGR} contain Non-SI Blackout Logic relays (3-2/5A, 3-2/2A, 3-2/3A, and 3-2/6A). These relays are energized when: the Non-SI Blackout Logic is not defeated, the EDG breaker is racked in, the EDG breaker is closed, and the bus undervoltage is clear.

LICENSEE EVENT REPORT (LER)

FACILITY NAME (1)	DOCKET (2)	LER NUMBER (6)			PAGE (3)
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	
Indian Point Unit 3	05000-286	2014	- 003	- 00	3 OF 5

The Non-SI Blackout relays send start signals to the turbine driven ABFW pump if a Non-SI Blackout occurs on 480 volt safety buses 3A or 6A, and to sequencing timers for sequencing essential loads onto the 480 volt safety buses (i.e., Component Cooling Water pumps (CCW) {CC}, Service Water (SW) {BI} pumps, and motor driven ABFW pumps). The Non-SI Blackout Logic Defeat circuitry prevents actuation of the Non-SI Blackout Logic relay during an SI condition coincident with loss of offsite power. The purpose of the Non-SI Blackout Logic Defeat circuitry is to minimize loads on the EDGs during the initial phases of an accident and prevent actuation of the Non-SI Blackout Logic relay. With the Non-SI Blackout Logic defeated, safeguards loads will sequence on from SI interlocking relays. The Non SI Blackout Logic Defeated circuit will perform a similar function when the EDG is shutdown from its manual control switches.

I&C technicians performed troubleshooting and determined that the reset switch for the "Non SI Blackout Logic Defeated" circuit (reset pushbutton) was stuck in the depressed position resulting in open contacts. The open switch contacts create an open circuit state, resulting in a failure to "seal in" the logic signal. During the 31 EDG monthly surveillance, the Non SI Blackout Logic actuated momentarily during the time between the EDG output breaker control switch being placed in the open position and the breaker opening and resulted in auto start of the 32 ABFP. Operations exited the 31 EDG Technical Specification Limiting Condition for Operation (LCO) at 17:37 hours on February 6, 2014. Operations considered the 31 EDG to be operable at approximately 16:02 hours when the 31 EDG control switch was placed in auto.

The "Non-SI Blackout Logic Defeated" push-button reset switch is manufactured by Honeywell {H260}, switch ID I7468860.

An extent of condition review was performed of other applicable reset switches. The review determined the Plant Equipment Database did not indicate that these reset switches are used elsewhere in the plant except for the 480 volt safety buses (2A/3A, 5A and 6A). One switch was changed out as a result of an event reported in LER-2000-003 for bus 6A and the reset pushbutton from this event for bus 3A was replaced. As there is no preventive maintenance (PM) for this switch, the remaining switch will be changed out.

The Cause of Event

The cause of the Non-SI Blackout Logic Defeated reset without operator action was that the reset pushbutton was stuck in the depressed position resulting in open contacts. During the performance of the monthly surveillance on the 31 EDG, the Non-SI Blackout Logic actuated momentary when the 31 EDG was stopped using the local control switch. The failure mechanism is an open circuit preventing the seal-in of the 3-5/2A relay (Non-SI Blackout Logic Defeated), thus providing a permissive to the Non-SI Blackout Logic before the 31 EDG breaker opened.

Corrective Actions

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

- The 31 EDG Non-SI Blackout Logic Defeated reset pushbutton was replaced.
- The remaining pushbutton that has not been replaced will be changed out with a new pushbutton
- Surveillance procedure 3PT-M79A and other procedures that utilize the Non-SI Blackout Logic Defeated reset pushbutton will be modified to add a verification to check to ensure the pushbutton is not left in the depressed position.

LICENSEE EVENT REPORT (LER)

FACILITY NAME (1)	DOCKET (2)	LER NUMBER (6)			PAGE (3)
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	
Indian Point Unit 3	05000-286	2014	- 003	- 00	4 OF 5

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 AFWS actuation. This event meets the reporting criteria because an automatic AFWP actuation was initiated at 15:53 hours, on February 6, 2014. On February 6, 2014, an 8-hour non-emergency notification was made to the NRC at 20:17 hours, for a valid actuation of the AFW System (Event Log #49802) under 10CFR50.72(b)(3)(iv)(A).

As a result of the event, there were no safety systems that were not capable of performing their safety function. In accordance with reporting guidance in NUREG-1022, an additional random single failure need not be assumed in that system during the condition. Therefore, there was no safety system functional failure reportable under 10 CFR 50.73(a)(2)(v).

Past Similar Events

A review was performed of the past three years for Licensee Event Reports (LERs) reporting a AFWP actuation. Two candidate LERs were identified. LER-2011-005 reported on an automatic actuation of the EDGs and AFWPs on August 19, 2011, due to undervoltage on 480 volt AC vital buses as a result of a loss of offsite power during a severe storm. LER-2013-005 reported an automatic actuation of safety Injection and Engineered Safety Features on March 27, 2013, during reactor protection system functional testing. LER-2011-005 did not have a similar cause as it was due to a loss of 138 kV offsite power due to lightning effects on a deficient ground grid. LER-2013-005 reported the AFWP and ESF actuation was due to faulty test lead, inadequate test procedure, and inadequate risk evaluation. This event has similar aspects as it was due to faulty equipment for testing (reset pushbutton vs test lead).

Safety Significance

This event did not have an effect on the health and safety of the public. The ABFW pump did not actuate for any condition that required mitigation action to protect the public health and safety. Although the pump was actuated it was not delivering flow to the SGs or operating at design conditions. The effect of the auto start was that the pump started and operated at idle awaiting operator action. Operators could stop pump operation or place the pump in service as conditions warranted.

The design of the AFW System is for the turbine driven ABFW pump to provide FW to the SGs during a station blackout or if both motor driven ABFW pumps are unavailable. There was no station blackout and both motor driven pumps (ABFW 31, 33) were available at the time of this event to provide AFW.

There were no significant potential safety consequences of the event under reasonable and credible alternative conditions. If this event occurred during a design basis accident it would not have affected accident mitigation capability. The failed switch would not have prevented applicable EDGs from starting, bus loading, or the ability to provide AFW. An engineering evaluation determined that EDG 31 would perform its design safety function during a Design Basis Accident (DBA) with no overloading if a component assigned to bus 2A/3A (e.g., 32 CCW pump) did not sequence and was loaded on the bus.

LICENSEE EVENT REPORT (LER)

FACILITY NAME (1)	DOCKET (2)	LER NUMBER (6)			PAGE (3)
Indian Point Unit 3	05000-286	YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	5 OF 5
		2014	- 003	- 00	

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

Engineering review of design documents concluded the failure of the reset circuit did not adversely affect the safety of the plant, the EDGs or Engineering Safeguards Features. Engineering's basis is as follows: 1) The degradation of the reset circuit does not prevent the actuation or reset of any components in response to a loss of offsite power (LOOP) event, 2) The degradation of the circuit does not prevent the actuation of any components in response to a SI condition and has minimal effect on reset functions, 3) The degradation of the circuit does impact EDG loading during an SI/LOOP condition however, current analysis concludes that the 31 EDG can support the additional load and satisfactorily perform its design function during a LOOP/SI actuation when there is a failure of any one 480 volt safety bus load breaker to trip, 4) The condition will also result in starting of the 32 AFWP when resetting SI but this condition has been determined not to adversely affect the safety of the plant since the AFWP will start and run at idle speed only, draw off minimal amount of steam and go into recirculation mode as the AFWP discharge flow control valves are closed and require manual action to open.