

Indian Point 3  
Nuclear Power Plant  
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Robert J. Barrett  
Site Executive Officer

May 17, 2000  
IPN-00-040

U.S. Nuclear Regulatory Commission  
ATTN: Document Control Desk  
Washington, D.C. 20555

SUBJECT: Indian Point 3 Nuclear Power Plant  
Docket No. 50-286  
License No. DPR-64  
Licensee Event Report # 2000-003-00  
**Automatic Actuation of Auxiliary Boiler Feedwater Pump 32  
During Testing of Emergency Diesel Generator 32  
Due to High Resistance in the Contacts of a Reset Switch in the  
Non-Safety Injection Blackout Logic Defeated Circuitry**

Dear Sir:

The attached Licensee Event Report (LER) 2000-003-00 is hereby submitted as required by 10 CFR 50.73. This event is of the type defined in 10 CFR 50.73 (a)(2)(iv) for a condition recorded in the New York Power Authority's (NYPA) corrective action process as Deviation Event Report DER 00-00926.

NYPA is making no new commitments in this LER.

Very truly yours,

A handwritten signature in black ink, appearing to read 'Robert J. Barrett', written over a horizontal line.

Robert J. Barrett  
Site Executive Officer  
Indian Point 3 Nuclear Power Plant

cc: See next page

RGN-001

IE22

cc: Mr. Hubert J. Miller  
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Resident Inspectors' Office  
Indian Point 3 Nuclear Power Plant

**LICENSEE EVENT REPORT (LER)**

(See reverse for required number of digits/characters for each block)

Estimated burden per response to comply with this mandatory information collection request: 50 hrs. Reported lessons learned are incorporated into the licensing process and fed back to industry. Forward comments regarding burden estimate to the Records Management Branch (T-6 F33), U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, and to the Paperwork Reduction Project (3150-0104), Office of Management and Budget, Washington, DC 20503. If 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.

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**TITLE (4)**  
Automatic Actuation of Auxiliary Boiler Feedwater Pump 32 During Testing of Emergency Diesel Generator 32 Due to High Resistance in the Contacts of a Reset Switch in the Non-Safety Injection Blackout Logic Defeated Circuitry

EVENT DATE (5)			LER NUMBER (6)			REPORT DATE (7)			OTHER FACILITIES INVOLVED (8)	
MONTH	DAY	YEAR	YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	MONTH	DAY	YEAR	FACILITY NAME	DOCKET NUMBER
04	19	2000	2000	-- 003	-- 00	05	17	2000		05000
									FACILITY NAME	DOCKET NUMBER
										05000

<b>OPERATING MODE (9)</b> N	<b>POWER LEVEL (10)</b> 100	<b>THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more) (11)</b>							
		20.2201(b)	20.2203(a)(2)(v)	50.73(a)(2)(i)	50.73(a)(2)(viii)				
		20.2203(a)(1)	20.2203(a)(3)(i)	50.73(a)(2)(ii)	50.73(a)(2)(x)				
		20.2203(a)(2)(i)	20.2203(a)(3)(ii)	50.73(a)(2)(iii)	73.71				
		20.2203(a)(2)(ii)	20.2203(a)(4)	<input checked="" type="checkbox"/> 50.73(a)(2)(iv)	OTHER				
		20.2203(a)(2)(iii)	50.36(c)(1)	50.73(a)(2)(v)	Specify in Abstract below or in NRC Form 366A				
		20.2203(a)(2)(iv)	50.36(c)(2)	50.73(a)(2)(vii)					

LICENSEE CONTACT FOR THIS LER (12)	
NAME Troy Schaefer, I&C Engineer	TELEPHONE NUMBER (Include Area Code) (914) 736-8797

COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT (13)										
CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO EPIX	CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO EPIX	
X	EK	HIS	M302	YES						

SUPPLEMENTAL REPORT EXPECTED (14)				EXPECTED SUBMISSION DATE (15)	MONTH	DAY	YEAR
YES (If yes, complete EXPECTED SUBMISSION DATE).	<input checked="" type="checkbox"/>	NO					

**ABSTRACT** (Limit to 1400 spaces, i.e., approximately 15 single-spaced typewritten lines) (16)

On April 19, 2000, the turbine driven Auxiliary Boiler Feedwater (ABFW) pump 32 automatically started unexpectedly coincident with opening the 32 Emergency Diesel Generator (EDG) output breaker during performance of monthly functional test 3PT-M79B. Normally the "Non-Safety Injection (SI) Blackout Logic Defeated" circuitry prevents automatic starting of equipment until manually reset. Operators secured the 32 ABFW pump. There was no injection of water into the steam generators. The cause of the event was a failed open Non-SI Blackout Logic Defeated push-button reset switch due to high resistance contacts. Corrective actions included troubleshooting that identified the cause, assessments that determined that the 32 ABFW pump and 32 EDG were operable, and replacement of the reset switch for bus 6A. The reset switches associated with EDGs 31 and 33 were tested and determined to be satisfactory. This event had no effect on the health and safety of the public.

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**TEXT (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 April 19, 2000, at approximately 1433 hours, with steady state reactor power at approximately 100 percent, 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-M79B) of the 32 Emergency Diesel Generator (EDG) {EK}. The clearing of the "Non-SI Blackout Logic Defeated" alarm was not expected 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 32 EDG to 480 Volt AC Bus 6A. 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 and returned to "Auto" at approximately 1438 hours. The 32 EDG was shutdown and its control switch was placed in "Auto" at approximately 1440 hours. A four-hour non-emergency event notification (ENS Log No. 36906 ) was made to the NRC at 1755 hours, reporting an automatic Engineered Safety Feature (ESF) actuation.

Operations recorded the event in Deviation Event Report (DER) 00-00926 and initiated an investigation into the cause of the event. The 32 ABFW pump auto-started after the 32 EDG output breaker to 480 Volt AC {ED} Bus 6A 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. Operations concluded that the 32 ABFW pump was operable.

The 480 volt AC Electrical Distribution System {ED} contains four safety buses (5A, 6A, 2A and 3A) with switchgear {SWGR} that 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. 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).

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

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 three conditions which cause the Non-SI Blackout Logic to be defeated are: 1) when the Main Control Board control switch for EDG 32 is in the close position, 2) when the Local Control Panel control switch for EDG 32 is in the close position (e.g., during testing), and 3) during an SI signal condition. The EDGs are designed to start on an SI but not load onto the 480 volt buses if offsite power is available.

I&C technicians performed troubleshooting and determined that the reset switch for the "Non SI Blackout Logic Defeated" circuit had high resistance in the switch contacts creating an open state, resulting in a failure to "seal in" the logic signal. The condition was masked during testing because the closed 32 EDG output breaker provides contacts to makeup the relay (3-2/6A) for the auto start circuit and energizes the relay (3-5/6A) for the Non-SI Blackout Logic Defeated circuit. I&C concluded that after the operator repositioned the 32 EDG manual control switch (W-2) to open the 32 EDG output breaker, relay 3-5/6A (associated with the "Non-SI Blackout Logic Defeated" circuit) de-energized due to the open condition of the reset switch, which is in the seal-in circuit. De-energizing relay 3-5/6A caused relay 3-2/6A (associated with "Non SI Blackout Bus 6A" circuit) to momentarily energize and initiate starting of the steam driven 32 ABEW pump. Other assigned loads did not actuate because they have sequencing timers which are designed such that the timer output goes to zero when the input is lost. When the contacts associated with the 32 EDG breaker opened, relay 3-2/6A de-energized removing the input signal. Operations exited the 32 EDG Technical Specification Limiting Condition for Operation (LCO) at 2146 hours, but considered the 32 EDG operable when the 32 EDG control switch was placed in auto at approximately 1440 hours. The Non-SI Blackout Logic Defeated push-button reset switch (480 volt bus 6A) was replaced on April 20.

The "Non-SI Blackout Logic Defeated" push-button reset switch is manufactured by Micro Switch {M302}, manufacturer part number 909AAA03.

An extent of condition review was performed of other reset switches and their condition assessed. A review of the Plant Equipment Database did not indicate that these reset switches are used elsewhere in the plant except for the other 480 volt safety buses (2A/3A and 5A). Testing was performed May 16 on the Non-SI Blackout Logic Defeated reset pushbutton switches associated with EDGs 31, 32, 33. Test results indicated satisfactory reset switch condition. This event is believed to be a random failure. Investigation into this event did not identify any adverse trends for these switches.

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CAUSE OF EVENT

The cause of the event was a failure of the "Non-SI Blackout Logic Defeated" push button reset switch (SB 1 Reset P.B. Test 1 Bus 6A) due to high resistance in the switch contacts creating an open state that prevented seal-in of the logic signal. The open state of the reset switch resulted in the de-energization of relay 3-5/6A of the Non-SI Blackout Logic Defeated circuitry in the switchgear for 480 volt bus 6A when the 32 EDG breaker control switch was returned to open. A failure evaluation concluded the high resistance in the contacts of the push-button reset switch was caused by oxidation.

CORRECTIVE ACTIONS

The following corrective actions have been performed to address the cause of this event:

- The failed push-button reset switch for the 32 EDG Non-SI Blackout Logic Defeated circuitry was replaced and successful testing performed.
- The Non-SI Blackout Logic Defeated reset push-button switches for EDGs 31, EDG 32, and EDG 33 were tested and determined to be satisfactory. I&C concluded that the reset switch contact resistance was acceptable and will not prevent proper relay operation.

ANALYSIS OF EVENT

This event is reportable under 10 CFR 50.73 (a) (2) (iv). The licensee shall report any event or condition that resulted in a manual or automatic actuation of any engineered safety feature (ESF). This event meets the reporting condition because the turbine driven ABFW pump (an ESF) automatically started due to an inadvertent actuation from a Non-SI Blackout signal.

A review of Licensee Event Reports (LERs) for the past three years for similar events involving inadvertent start of the ABFW pumps identified LER 97-001. However, LER 97-001 was a result of ABFW pump actuation after closing the EDG output breaker switch rather than opening the switch. The cause of that event was due to a faulty breaker output control switch (W-2). Corrective actions for LER 97-001 would not have prevented this event because the cause was different.

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.

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The design of the AFW System is for the turbine driven AFW pump to provide feedwater to the SGs during a station blackout or if both motor driven AFW pumps are unavailable. There was no station blackout and both motor driven pumps (ABFW Pump 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 effected 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 32 would perform its design safety function during a Design Basis Accident (DBA) with no overloading if a component assigned to bus 6A (e.g., 32 RHR pump) did not sequence and was loaded on the bus (see LER 99-032-02).

Review of this event against the guidelines of NEI 99-02 Rev. 0, "Regulatory Assessment Performance Indicator Guideline," concluded it was not a safety system functional failure (SSFF).

The reported condition (failed reset switch in the Non-SI Blackout Logic Defeated circuit) could not alone have prevented fulfillment of the safety function of the AFW system, ESF actuation system, or emergency AC power system. It is not necessary to assume an additional random single failure in that system in accordance with the guidelines of NUREG-1022 for 10CFR50.73(a)(2)(v). There was no actual failure of the capability of the AFW system to start on demand and deliver required flow, of the ESF Actuation System to actuate required ESF equipment, or the emergency AC power system to provide power for required loads, therefore the event was not an SSFF.