Indian Point 3
Nuclear Power Plant
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New York Power Authority

Robert J. Barrett
Site Executive Officer

November 9 , 1999
IPN-99-119

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 # 1999-013-00
Automatic Actuation of an Emergency Diesel Generator As a Result of Inadvertant Actuation of Safety Injection Relays Due to Personnel Error Caused by Poor Man-Machine Interface Design

Dear Sir:

The attached Licensee Event Report (LER) 1999-013-00 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).

The Authority is making no new commitments in this LER.

Very truly yours,

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

cc: See next page

IE22

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

NRC FORM 366 (6-1998) U.S. NUCLEAR REGULATORY COMMISSION

LICENSEE EVENT REPORT (LER)

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

APPROVED BY OMB NO. 3150-0104 EXPIRES 06/30/2001

FACILITY NAME (1)	DOCKET NUMBER (2)	PAGE (3)
Indian Point 3	05000286	1 OF 4

TITLE (4)

Automatic Actuation of an Emergency Diesel Generator as a Result of an Inadvertent Actuation of Safety Injection Relays Due to Personnel Error Caused by Poor Man-Machine Interface Design

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
10	12	1999	1999	-- 013 --	00	11	09	1999		05000
									FACILITY NAME	DOCKET NUMBER
										05000

OPERATING MODE (9)	N
POWER LEVEL (10)	000

THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more) (11)

	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)	✓	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	TELEPHONE NUMBER (Include Area Code)
Richard Burroni, Instrumentation & Control Manager	(914) 736-8794

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

SUPPLEMENTAL REPORT EXPECTED (14)			EXPECTED SUBMISSION DATE (15)	MONTH	DAY	YEAR
	YES (If yes, complete EXPECTED SUBMISSION DATE).	✓ NO				

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

On October 12, 1999, during a refueling outage, the 32 Emergency Diesel Generator (EDG) associated with bus 6A automatically started. EDG 32 started due to inadvertent actuation of Safety Injection (SI) relays, in the switchgear for bus 6A, during performance of blackout test 3PT-R003B. A technician performing the test was installing an electrical jumper in accordance with the test procedure when he inadvertently made up a nearby contact that actuated SI relays. The Engineered Safety Feature (ESF) equipment associated with bus 6A, including the 33 SI pump, had their electrical breakers racked into the test position for the test. Therefore, ESF equipment, including the 33 SI pump, did not start and no safety injection occurred. The EDG output breaker did not close onto bus 6A, per design, because normal (offsite) power was available. The event was due to personnel error caused by poor design (man-machine interface) in that the application of jumpers on field relays was required to fulfill the requirements of testing with relay terminal screws that are not specifically designed for the application of jumpers. Corrective action to be taken is to install relay test connectors on applicable relay terminals to facilitate surveillance testing. There was no effect on public health and safety.

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 October 12, 1999, at approximately 1944 hours, with the plant in cold shutdown (CSD) during a refueling outage, the 32 Emergency Diesel Generator (EDG) {EK} associated with 480 volt safety bus 6A {ED} automatically started and came up to speed. EDG 32 started due to an inadvertent actuation of Safety Injection (SI) {BQ} relays {RLY} during performance of test 3PT-R003B, "Safety Injection Test Breaker Sequencing/Bus Stripping." An Instrumentation and Control (I&C) technician performing the test was applying an alligator type jumper clip on terminal screw 14 of relay 27-6A/X3 located in 480 volt Switchgear 32 {SWGR}. As the technician was withdrawing his hand from the applied jumper, he noticed that the clip was coming off the terminal screw and he attempted to re-land the clip, but inadvertently shorted terminals 14 and 13 of relay 27-6A/X3. The shorting of terminals 14 and 13 applied a positive feed to relays 3-1/6A, SI/6A, and SI/6A1. The actuation of these relays initiated an SI sequence for 480 volt electrical safety bus 6A {BU}. In accordance with design, the load stripping sequence for bus 6A was initiated and its assigned Engineered Safety Feature (ESF) equipment including SI pump 33 sequenced as expected. The electrical breakers {BKR} associated with the ESF equipment assigned to bus 6A were racked into the test position for the test, so no ESF equipment actually closed onto bus 6A or started. Because SI pump 33 was in the test condition, no safety injection occurred. The output breaker for EDG 32 did not close onto bus 6A, per design, because normal power (offsite) was available. Equipment operated as expected in response to the event. The boundary of the safeguards initiation circuity and load sequencing is the input terminals to the relays in the switchgear.

The start of EDG 32 was discovered when Control Room {NA} Operators observed a "DG Trouble" alarm {ALM}. Indication of loss of power to Motor Control Center {MCC} 37 (the MCC-37 Auto Trip alarm), and loss of power to Battery Charger {BYC} 32 (the Battery Charger Trouble alarm) was subsequently observed. The Shift Manager was notified by operators of a loss of MCC-37 due to an inadvertent actuation of a relay during testing. Operators initiated an investigation and recovery actions. Operators placed the 32 static inverter {INVT} on backup power at 2030 hours, and then cross tied the 31 and 32 DC buses due to the loss of power from MCC-37. At 2035 hours, the 32 EDG was secured. At approximately 2157 hours, operators declared EDG 32 inoperable for performance of re-testing in accordance with test 3PT-R003B. Restoration to service of MCC-37, the 32 battery charger, and separation of DC buses 31 and 32 was completed by 2210 hours. Operations reported the event to the NRC at 2327 hours. On October 14, after completion of successful testing, operators returned the control switch for EDG 32 to automatic at approximately 0349 hours. I&C performed an investigation of the cause of the event, including an assessment of the appropriateness of current processes and capabilities to prevent inadvertent equipment operation. I&C concluded that the jumper used for this test step had adequate insulation on the clips used to terminate to the relay screws, and testing procedures were adequate.

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

Relatively few field jumpers are used during the performance of Technical Specification (TS) required surveillance tests. However, the number and location of jumpers in the Station Blackout series of test procedures (e.g., 3PT-R003B) have increased significantly as a result of the additional testing requirements imposed by Generic Letter 96-01, "Testing of Safety-Related Logic Circuits."

CAUSE OF EVENT

This event was due to personnel error caused by poor design (man-machine interface). A test technician inadvertently shorted the terminals of a relay during testing with a test jumper and actuated SI relays. The short occurred due to poor plant design since the jumper used was determined to have adequate insulation on its clip. The cause of the event was poor plant design in that the application of jumpers on field relays was required to fulfill the requirements of testing and the relay terminal screws are not specifically designed for the application of jumpers.

CORRECTIVE ACTIONS

The following corrective actions have been or will be performed under the Authority's corrective action program to address the cause of the event:

- A meeting was conducted with I&C personnel to discuss the event and reinforce the need to be alert and aware of trip hazards.

- An extent of condition (EOC) review was performed which concluded that there is no current EOC because these types of jumpers are temporary and not left installed. Heightened awareness and installation of the test connectors are expected to prevent recurrence.

- Relay test connectors will be installed on applicable relay terminals to fulfill the necessary testing requirements of various surveillance tests. Installation of the test connectors are scheduled for refueling outage 11 (RO-11) currently planned for May 2001.

ANALYSIS OF EVENT

The 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 an Engineered Safety Feature (ESF).

This event meets the reporting criteria because the 32 EDG automatically started due to actuation of SI relays. Although EDG 32 started, it did not load onto its assigned bus 6A per design. The load stripping sequencing for bus 6A was initiated and ESF equipment sequenced per design. Because the ESF equipment electrical breakers associated with bus 6A were racked into their test position for the test, no ESF equipment started. At approximately 2035 hours, the 32 EDG was secured. At 2327 hours, operations notified the NRC of an ESF actuation (ENS Log No. 36283).

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

A review of Licensee Event Reports (LER) for the previous two years for events that involved ESF actuations due to personnel error identified the following: LER 99-003, 97-009 (7/18/97), 97-008 (7/16/97). None of these LERs involved poor design, or alligator clip jumpers specifically, and corrective actions for those events are not expected to 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 conditions that required mitigation. The plant responded per design to the inadvertent actuation of the SI relays. Offsite power was available and continued to power bus 6A and the redundant 480 volt safety buses (buses 5A and 2A/3A). EDG 32 started but its output breaker remained open per design because offsite power continued to energize its assigned 480 volt bus 6A. The SI actuation was not the result of plant conditions or degraded equipment but due to an inadvertent signal that actuated SI relays.

Review of this event against the guidelines of draft NEI 99-02 Rev. C, "Regulatory Assessment Performance Indicator Guideline," concluded it was not a safety system functional failure and would not be expected to impact the mitigating cornerstone concerning unavailability (i.e., high pressure safety injection, emergency AC power system, residual heat removal (RHR) system. auxiliary feedwater (AFW) system). The applicable emergency AC power source and ESF actuation circuity operated per design. The plant was in cold shutdown (CSD), therefore SI and AFW were not required to be available per TS. The EDGs were available per the TS and could have loaded upon an undervoltage condition on the safety buses. The RHR system was available in accordance with the TS. Assessment of this event under the new NRC Significance Determination Process results in a screen out (Green Item). The event did not prevent meeting a reactor safety cornerstone objective, there was no expected impact on risk, and there was no loss of system safety function.

There were no potential safety consequences of the event under reasonable and credible alternative conditions. Since the blackout test is only performed during cold shutdown conditions it is not credible or reasonable to consider this event under postulated accident conditions that are only applicable in a different plant mode. Accidents or events that could be considered applicable in shutdown are the Fuel Handling Accident, Dilution Accident, Loss of Residual Heat Removal Cooling, Loss of Spent Fuel Cooling, RCS Low Temperature Overpressure event, and Loss of Offsite Power event. TS 3.1 requires redundant decay heat removal capability in CSD, TS 3.3.A.8 requires isolation of the SI pumps to prevent injection into the RCS, and TS 3.7 requires two sources of emergency AC power. The plant was in compliance with these TS and there are procedures to mitigate these events. During this event the required equipment functioned as designed. The pending Indian Point 3 Improved TS bases state the worst case bounding events are deemed not credible in CSD and refueling because the energy contained within the reactor pressure boundary, reactor coolant temperature and pressure, and corresponding stresses result in the probabilities of occurrence being significantly reduced or eliminated, and in minimal consequences.