Indian Point 3
Nuclear Power Plant
P.O. Box 215
Buchanan, New York 10511
914-736-8000

New York Power Authority

January 18, 1993
IP3-NRC-93-005

Docket No. 50-286
License No. DPR-64

Document Control Desk
Mail Station PI-137
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

Dear Sir:

The attached is a voluntary Licensee Event Report LER 93-002-00. The event may have generic interest to the nuclear power industry.

Very truly yours,

W A Josiger

William A. Josiger
Resident Manager
Indian Point Three Nuclear Power Plant

waj/ed/rj
Attachment

IE22
1/1

NRC Form 366 (9-83)

U.S. NUCLEAR REGULATORY COMMISSION
APPROVED OMB NO. 3150-0104
EXPIRES 8/31/88

LICENSEE EVENT REPORT (LER)

FACILITY NAME (1)	DOCKET NUMBER (2)	PAGE (3)
Indian Point Unit 3	0 5 0 0 0 2 8 6	1 OF 0 5

TITLE (4) Design Oversight Discovered That Could Result in Loss of Containment For Certain Accident Scenarios

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 NAMES	DOCKET NUMBER(S)
1 1	2 5	9 2	9 3	0 0 2	0 0	0 1	1 8	9 3		0 5 0 0 0
										0 5 0 0 0

OPERATING MODE (9): N

POWER LEVEL (10): 0 6 2

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

☐ 20.402(b)	☐ 20.405(c)	☐ 50.73(a)(2)(iv)	☐ 73.71(b)
☐ 20.405(a)(1)(i)	☐ 50.36(c)(1)	☐ 50.73(a)(2)(v)	☐ 73.71(c)
☐ 20.405(a)(1)(ii)	☐ 50.36(c)(2)	☐ 50.73(a)(2)(vii)	☒ OTHER (Specify in Abstract below and in Text, NRC Form 366A)
☐ 20.405(a)(1)(iii)	☐ 50.73(a)(2)(i)	☐ 50.73(a)(2)(viii)(A)	
☐ 20.405(a)(1)(iv)	☐ 50.73(a)(2)(ii)	☐ 50.73(a)(2)(viii)(B)	
☐ 20.405(a)(1)(v)	☐ 50.73(a)(2)(iii)	☐ 50.73(a)(2)(x)	Voluntary LER

LICENSEE CONTACT FOR THIS LER (12)

NAME	TELEPHONE NUMBER	
	AREA CODE	
Edward Diamond, Senior Plant Engineer	9 1 4	7 3 6 - 8 0 4 5

COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT (13)

CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NPRDS	CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NPRDS

SUPPLEMENTAL REPORT EXPECTED (14)

☐ YES (If yes, complete EXPECTED SUBMISSION DATE) ☒ NO

EXPECTED SUBMISSION DATE (15): MONTH | DAY | YEAR

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

On November 25, 1992, with the unit operating at sixty-two percent power, the New York Power Authority discovered a design oversight that, under certain scenarios, could have potentially resulted in a loss of containment integrity following a small break loss of coolant accident (SBLOCA) or main steam line break (MSLB) inside containment. The loss of containment was related to the reenergizing of non-safety related equipment inside containment according to emergency operating procedures. The cause of the event was a design oversight. The exact root cause is unknown. Corrective action will be to install fuses as redundant isolation devices or provide increased sensitivity to the short time overcurrent trip units of the pressurizer heater group main supply breakers.

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TEXT (If more space is required, use additional NRC Form 366A's) (17)

DESCRIPTION OF THE EVENT

On November 25, 1992, with the reactor at sixty-two percent power, the New York Power Authority discovered a design oversight that could have potentially resulted in a loss of containment integrity following a small break loss of coolant accident (SBLOCA) or main steam line break (MSLB) inside containment. Engineers following up on an Electrical Distribution System Functional Inspection (EDSFI) open item discovered the problem.

The potential loss of containment is based upon the following scenario:

1. A small break LOCA or main steam line break occurs inside containment.

2. Initially the pressurizer (PRZR) heaters, along with other non-essential loads, would be stripped from the buses, deenergized by the safeguards sequence signal.

3. Emergency Operating Procedures (EOPs) direct operators to re-energize pressurizer heaters in response to a small break LOCA or main steam line break inside containment.

4. According to Indian Point Three's design basis, use of the pressurizer heaters is not required to bring the plant to the safe shutdown condition. Consequently, pressurizer heaters were not included in the 10CFR50.49 electrical equipment environmental qualification (EQ) program.

   Therefore analysis must assume that an electrical fault occurs at one of these locations in the post-LOCA, adverse containment environment. The three potential locations on each pressurizer heater circuit that are subject to a three-phase, bolted electrical fault are:

   o The splice at the pressurizer
   o The bolted connection at the pressurizer
   o The pressurizer heater itself

5. A single failure is assumed to occur at the molded case circuit breaker (MCCB) provided for the individual pressurizer heater circuit that prevents the MCCB from tripping and isolating the fault.

6. The fault will be cleared by the associated pressurizer heater group 480 volt bus supply breaker via the time-delayed overcurrent protection within twenty-eight seconds.

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TEXT (If more space is required, use additional NRC Form 366A's) (17)

During the time delay period the associated containment penetration will be carrying greater than design rated current flow. Therefore it is postulated that the insulation and conductors for the three phases of the heater circuit will be deteriorated in the containment penetration, providing a contiguous path from containment atmosphere to the outside environment. The total cross-sectional area has been calculated at 0.01 square feet.

A similar concern was identified for motor control center (MCC) 38, located inside containment. It also is reenergized as part of the recovery actions contained in the emergency operating procedures to make the control rod drive mechanism (CRDM) cooling fans and reactor coolant pump (RCP) bearing lift pumps available. MCC 38 is non-safety related equipment outside the EQ program and it could become involved in a fault that would result in deterioration of the insulation and conductors in the associated containment penetration. A modification installed during the cycle 8/9 refueling outage, April through August 1992, addressed the concern. The modification provided fuses in the MCC 38 power supply cables as a backup to the 480 volt bus supply breaker.

The NRC Operations Center was notified via the Emergency Notification System (ENS) at 0000 hours on November 26, 1992. The NRC resident inspector was notified at 0015. The design oversight was evaluated via a reasonable assurance of safety, RAS 92-03-167, Revision 1, "Reasonable Assurance that Indian Point 3 Can Be Safely Operated Above Cold Shutdown While Containment Electrical Penetration Design Basis Calculations and Analysis Are Being Finalized," which found that plant operation could safely continue while the engineering analysis of the pressurizer heater circuits was in progress. RAS 92-03-167, Revision 1 was reviewed by the Plant Operating Review Committee (PORC) on November 25, 1992.

CAUSE OF THE EVENT

The cause of the event was a design oversight in the original design basis. The original plant design did not consider the pressurizer heaters as a component needed for accident mitigation. Yet, Operating Instruction E-2, "Detailed Recovery Procedure for Loss of Secondary Coolant," in the original nuclear steam supply system (NSSS) vendor supplied Indian Point Three Plant Manual directs operators to energize pressurizer heaters as part of the recovery actions to a main steam line break. The exact root cause of the event is unknown.

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TEXT (If more space is required, use additional NRC Form 366A's) (17)

CORRECTIVE ACTIONS

The design oversight was evaluated via reasonable assurances of safety, RAS 92-03-167, Revisions 1 and 2, which found that plant operation could safely continue while the engineering and installation work for corrective action are in progress. Two corrective actions are being evaluated to resolve this issue:

1. Installation of fuses in series with the molded case circuit breakers in the individual power supply circuits to the pressurizer heaters

2. Modification or replacement of the overcurrent trip units on the pressurizer heater main power supply breakers to provide increased sensitivity

One of these options will be completed by June 30, 1993.

Fuses were installed in the MCC 38 power supply cables as a backup to the 480 volt bus supply breaker during the cycle 8/9 refueling outage, April through August 1992.

A fourteen day letter outlining the event and corrective actions was submitted to the NRC on December 9, 1992 in accordance with agreement reached in a teleconference on December 1, 1992.

ANALYSIS OF THE EVENT

This event is being reported as a voluntary LER. The reportability criteria of 10CFR50.73 are not applicable to this event.

SAFETY SIGNIFICANCE

The design oversight described in this LER has existed since initial plant startup. During that time the plant has not experienced a small break LOCA or main steam line break inside containment. Furthermore, if such an event had occurred and the described potential loss of containment integrity had also occurred, engineering calculations show that the magnitude of release would not have exceeded 10CFR100 limits. The design oversight was evaluated via reasonable assurances of safety, RAS 92-03-167, Revisions 1 and 2, which found that plant operation could safely continue while the engineering and installation work for the corrective action were in progress.

*U.S. GPO: 1988-520-589 00070

This event had no impact on public health and safety.

No similar LERs have been submitted to date.

SECURING FROM THE EVENT

The design oversight was evaluated via reasonable assurances of safety, RAS 92-03-167, Revisions 1 and 2, which found that plant operation could safely continue while the engineering and installation work for corrective action are in progress.

Fuses were installed in the MCC 38 power supply cables as a backup to the 480 volt bus supply breaker during the cycle 8/9 refueling outage, April through August 1992.