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Vice President

Consolidated Edison Company of New York, Inc.  
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October 28, 1991

Re: Indian Point Unit No. 2  
Docket No. 50-247  
LER 91-20-00

Document Control Desk  
US Nuclear Regulatory Commission  
Mail Station P1-137  
Washington, DC 20555

The attached Licensee Event Report LER 91-20-00 is hereby  
submitted in accordance with the requirements of 10 CFR 50.73.

Very truly yours,



Attachment

cc: Mr. Thomas T. Martin  
Regional Administrator - Region I  
US Nuclear Regulatory Commission  
475 Allendale Road  
King of Prussia, PA 19406

Mr. Francis J. Williams, Jr., Project Manager  
Project Directorate I-1  
Division of Reactor Projects I/II  
US Nuclear Regulatory Commission  
Mail Stop 14B-2  
Washington, DC 20555

Senior Resident Inspector  
US Nuclear Regulatory Commission  
PO Box 38  
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9111070107 911028  
PDR ADOCK 05000247  
S PDR

*Handwritten initials/signature*

LICENSEE EVENT REPORT (LER)

ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS INFORMATION COLLECTION REQUEST: 50.0 HRS. FORWARD COMMENTS REGARDING BURDEN ESTIMATE TO THE RECORDS AND REPORTS MANAGEMENT BRANCH (P-530), U.S. NUCLEAR REGULATORY COMMISSION, WASHINGTON, DC 20555, AND TO THE PAPERWORK REDUCTION PROJECT (3150-0104), OFFICE OF MANAGEMENT AND BUDGET, WASHINGTON, DC 20503.

FACILITY NAME (1) Indian Point Unit No. 2						DOCKET NUMBER (2) 0 5 0 0 0 2 4 7 1			PAGE (3) 1 OF 0 4		
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TITLE (4)  
Determination of 480V Switchgear Room Temperature

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)																																																																																																
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LICENSEE CONTACT FOR THIS LER (12)

NAME Pedro Franceschi						TELEPHONE NUMBER 9 1 4 5 2 6 - 5 6 7 0					
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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)

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

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

Based on an engineering evaluation, it was determined on September 27, 1991 that the 480 Volt Switchgear room temperature, under certain conditions, could exceed the maximum temperature recommended by the safeguards equipment switchgear manufacturers. Specifically, during a loss of Coolant Accident with offsite power available, a postulated single failure could render the room's ventilation system unavailable, resulting in a calculated maximum ambient temperature of 135°F after several hours for the worst summer design outside temperature of 95°F.

Immediate corrective actions consisted of procedural changes to verify operation of the ventilation system during periodic operator rounds and, in the event of an accident, to open doors to establish natural circulation (stack effect).

**LICENSEE EVENT REPORT (LER)  
TEXT CONTINUATION**

ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS INFORMATION COLLECTION REQUEST: 50.0 HRS. FORWARD COMMENTS REGARDING BURDEN ESTIMATE TO THE RECORDS AND REPORTS MANAGEMENT BRANCH (P-530), U.S. NUCLEAR REGULATORY COMMISSION, WASHINGTON, DC 20555, AND TO THE PAPERWORK REDUCTION PROJECT (3150-0104), OFFICE OF MANAGEMENT AND BUDGET, WASHINGTON, DC 20503.

FACILITY NAME (1)  Indian Point Unit No. 2	DOCKET NUMBER (2)  0 5   0   0   0   2   4   7	LER NUMBER (6)			PAGE (3)		
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER			
		9 1	0 2   0	0 0	0 2	OF	0 4

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

**PLANT AND SYSTEM IDENTIFICATION:**

Westinghouse 4-Loop Pressurized Water Reactor

**IDENTIFICATION OF OCCURRENCE:**

Determination of 480 Volt Switchgear Room temperature exceeding equipment manufacturer's maximum.

**EVENT DATE:**

September 27, 1991

**REPORT DUE DATE:**

October 28, 1991

**REFERENCES:**

Significant Occurrence Report (SOR) 91-485

**PAST SIMILAR OCCURRENCE:**

None

**DESCRIPTION OF OCCURRENCE:**

While performing an ongoing evaluation of the adequacy of ventilation systems of mild environment safety related areas, the Engineering Department determined, on September 27, 1991, that a single failure of the power supply to the 480 Volt Switchgear Room Ventilation System would result in loss of the system. An evaluation of the different combinations of Accidents and Offsite Power availability states and the resulting calculated maximum ambient temperature concluded that for a Loss of Coolant Accident (LOCA) with offsite power available and no ventilation, the maximum calculated ambient temperature in the 480 Volt Switchgear Room would exceed the manufacturers' recommended temperature for the safeguards equipment switchgear in this room.

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		9 1	0 2 0	0 0	0 3	OF	0 4

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

**ANALYSIS OF OCCURRENCE:**

The ventilation systems for mild environment safety related areas outside the Central Control Room (CCR) were originally designed to take a single active failure, and were intended to be manually re-established after plant post-accident stabilization. Under these circumstances, loss of a switchgear room ventilation fan was tolerable (2 other fans are available) and loss of the MCC single breaker or the MCC itself was recoverable (change out breaker with a spare breaker or layout casualty cables from a different MCC to the fan if the MCC was lost). In September 1991 a re-evaluation was made of the adequacy of the ventilation system for the mild environment of the 480 Volt Switchgear room. This re-evaluation postulated a single random failure of MCC #29 (all fans lost) coincident with a large break LOCA with Offsite Power available.

A computer model was developed and different room configurations were introduced to simulate the loss of all fans coincident with an assumed lack of any capability for stack effect. Heatup rates were calculated, and it was determined that ambient temperatures would exceed the switchgear equipment manufacturers' recommended temperature. The calculated rate of temperature increase was contrary to the empirical experience of station personnel who had been in the room on hot summer days without the fans running. Tests were conducted to establish actual ambient temperatures relating to the computer model room configurations under varying assumptions (i.e., no fans running, room doors closed; no fans running, doors open to provide stack effects; one fan running) to ascertain and/or refine the computer model assumptions. Further engineering evaluations of the switchgear equipment itself were also performed to determine the actual maximum calculated ambient temperature in which the equipment was capable of operating. Although the computer model indicated that the design basis large break LOCA with Loss of Offsite Power would not render the equipment inoperable in the no forced ventilation case, the Large Break LOCA with Offsite Power available and no forced ventilation case resulted in the room maximum calculated ambient temperature exceeding the equipment capability after several hours. The large break LOCA with Offsite Power available allows operators to load more equipment than when there is a Loss of Offsite power. Thus, this case results in a higher heat load in the room and without forced ventilation, results in a higher calculation room temperature.

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**CAUSE OF OCCURRENCE:**

At the time of the plant design, the worst case accident utilized for operability modeling was the Large Break LOCA with no Offsite Power available. The ventilation system for the 480 Volt Switchgear Room was originally designed to take a single active failure. Since the system is manually initiated after a Design Basis Large Break LOCA, the system was also considered recoverable given a failure of the MCC #29 supply breaker (change out breaker with a spare breaker or layout casualty cables from a different MCC to the fan if the MCC was lost). While performing an engineering re-evaluation which postulates a single random failure of MCC #29 with Offsite Power available, it was found that the maximum calculated ambient room temperature exceeded the safeguards equipment switchgear maximum permissible temperature. This condition should not occur if the room configuration is altered to allow for natural circulation (stack effect).

**CORRECTIVE ACTION:**

The immediate corrective actions consisted of procedural changes to verify operation of the ventilation system during periodic operator rounds and, in the event of an accident, to open doors to establish natural circulation (stack effect).

Longer term corrective actions involve the separation of the power supplies to two fans to two separate MCCs with Emergency Diesel back-up, the installation of redundant temperature switches which alarm in the CCR, and appropriate changes for a Room High Temperature Alarm Response Procedure.

Additional confirmatory HVAC calculations are being performed, and a supplementary LER will be submitted if necessary.