

Indian Point 3
Nuclear Power Plant
P.O. Box 215
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L. M. Hill
Resident Manager

March 4, 1995
IPN-95-031

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
LER 95-003-00
"Potential Single Failure of the Carbon Dioxide (CO₂) Fire Protection System Could Result in the Loss of Ventilation to the 480VAC Switchgear Room Placing the Plant in an Unanalyzed Condition"

Dear Sir:

The attached Licensee Event Report (LER) 95-003-00 is hereby submitted as required by 10 CFR 50.73. This event is the type defined in 10 CFR 50.73(a)(2)(ii)(A) and 10 CFR 50.73(a)(2)(ii)(B). Also attached are the commitments made by the Authority in this LER.

Very truly yours,

A handwritten signature in cursive script, appearing to read 'L. M. Hill'.

L. M. Hill
Resident Manager
Indian Point 3 Nuclear Power Plant

LMH/vjw

Attachments

cc: See next page

100040

9503100159 950304
PDR ADOCK 05000286
S PDR

Handwritten initials or a signature in the bottom right corner of the page.

cc:

Mr. Thomas T. Martin
Regional Administrator
Region I
U.S. Nuclear Regulatory Commission
475 Allendale Road
King of Prussia, Pennsylvania 19406-1415

INPO Record Center
700 Galleria Parkway
Atlanta, Georgia 30339-5957

U.S. Nuclear Regulatory Commission
Resident Inspectors' Office
Indian Point 3 Nuclear Power Plant

List of Commitments

Number	Commitment	Due
IPN-95-031-01	A Modification, MMP 95-03-056 CBHV, will be installed to preclude a single failure from causing a loss of ventilation exhaust fans 33 and 34.	Prior to plant startup.
IPN-95-031-02	The safety significance for this event, when previous plant operation was above cold shutdown and prior to installing the switchgear room temperature indicator, is under investigation and will be reported in a supplement.	May 5, 1995
IPN-95-031-03	The New York Power Authority (NYPA) is continuing its investigation into the reasons for the delay in addressing the event reported in LER 95-003-00 to determine if additional action is warranted.	May 5, 1995

LICENSEE EVENT REPORT (LER)

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

ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS INFORMATION COLLECTION REQUEST: 50.0 HRS. FORWARD COMMENTS REGARDING BURDEN ESTIMATE TO THE INFORMATION AND RECORDS MANAGEMENT BRANCH (MNB 7714), 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.

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TITLE (4) Potential Single Failure of the Carbon Dioxide (CO₂) Fire Protection System could Result in the Loss of Ventilation to the 480VAC Switchgear Room Placing the Plant in an Unanalyzed Condition

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
02	02	95	95	-- 003 --	00	03	04	95	FACILITY NAME	DOCKET NUMBER 05000
									FACILITY NAME	DOCKET NUMBER 05000

OPERATING MODE (9) N	THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more) (11)									
POWER LEVEL (10) 000	<input type="checkbox"/> 20.402(b)	<input type="checkbox"/> 20.405(c)	<input type="checkbox"/> 50.73(a)(2)(iv)	<input type="checkbox"/> 73.71(b)						
	<input type="checkbox"/> 20.405(a)(1)(i)	<input type="checkbox"/> 50.36(c)(1)	<input type="checkbox"/> 50.73(a)(2)(v)	<input type="checkbox"/> 73.71(c)						
	<input type="checkbox"/> 20.405(a)(1)(ii)	<input type="checkbox"/> 50.36(c)(2)	<input type="checkbox"/> 50.73(a)(2)(vii)	<input type="checkbox"/> OTHER						
	<input type="checkbox"/> 20.405(a)(1)(iii)	<input type="checkbox"/> 50.73(a)(2)(i)	<input type="checkbox"/> 50.73(a)(2)(viii)(A)	(Specify in Abstract below and in Text, NRC Form 366A)						
	<input type="checkbox"/> 20.405(a)(1)(iv)	<input checked="" type="checkbox"/> 50.73(a)(2)(ii)	<input type="checkbox"/> 50.73(a)(2)(viii)(B)							
<input type="checkbox"/> 20.405(a)(1)(v)	<input type="checkbox"/> 50.73(a)(2)(iii)	<input type="checkbox"/> 50.73(a)(2)(x)								

LICENSEE CONTACT FOR THIS LER (12)

NAME Thomas Klein, Manager of Electrical/Instrumentation & Control Engineering	TELEPHONE NUMBER (Include Area Code) (914)736-8879
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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)		EXPECTED SUBMISSION DATE (15)	MONTH	DAY	YEAR
<input checked="" type="checkbox"/> YES (If yes, complete EXPECTED SUBMISSION DATE)	<input type="checkbox"/> NO		05	05	95

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

On February 2, 1995, with the plant in the cold shutdown condition, a drawing review verified that the 480VAC vital switchgear room ventilation system located in the Control Building 15' elevation could be lost due to the single failure of a component in an interconnected system. A carbon dioxide (CO₂) fire protection system relay could cause a failure of the Control Building 15' elevation ventilation system which could result in elevated switchgear room temperatures. This condition could affect the operability of 480VAC switchgear buses 2A, 3A, 5A and 6A. This event was caused by inadequate analysis during the original plant design that did not recognize that a failure of the switchgear room ventilation could have affected the operability of the 480VAC switchgear under certain plant operating conditions. A four hour report was made at 2051 hours on February 2, 1995. Corrective actions include a modification to preclude this postulated single failure from causing the loss of the Control Building 15' elevation ventilation system. The safety significance for this event, when previous plant operation was above cold shutdown and prior to installing the switchgear room temperature indicator, is under investigation and will be reported in a supplement.

LICENSEE EVENT REPORT (LER)
TEXT CONTINUATION

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

DESCRIPTION OF THE EVENT

On February 2, 1995 with the plant in the cold shutdown condition with reactor power at 3 cps, reactor coolant temperature at 97 degrees Fahrenheit, reactor coolant pressure at atmospheric, and pressurizer level at 34%, Deviation Event Report (DER) 95-0215 was issued by an engineer from the Electrical Design group. A four hour report was made to the NRC pursuant to 10 CFR 50.72(b)(2)(i), at 2051 hours on February 2, 1995. The DER identified that both exhaust fans (FAN) 33 and 34 for the 480VAC switchgear (SWGR) room (15' elevation of the Control Building (NA)) could be stopped due to a failure (spurious energization) of a single carbon dioxide (CO₂) fire protection (KQ) relay (RLY) in panel TR2. The switchgear loading capabilities are based on a design temperature of 104 degrees Fahrenheit in order to handle peak Design Basis Accident loading. Exceeding this temperature under this condition would result in exceeding the analyzed basis for the switchgear current rating.

The Control Building 15' elevation ventilation exhaust fans 33 and 34 are interlocked with the CO₂ fire protection system such that actuation of the system would automatically stop both fans and close the associated louvers. The CO₂ fire protection system for the Control Building contains a relay which, if energized, would de-energize both ventilation exhaust fans 33 and 34, which also closes louver 319 in the Control Building 15' elevation. Normally closed contacts of the relay are interlocked with both fan circuits. Failure of this relay is a single failure which could de-energize both ventilation exhaust fans 33 and 34.

The Electrical Engineering group's investigation into this event has revealed that a substantial delay occurred between the initial recognition of this design deficiency and its resolution. With the plant in the cold shutdown condition DER 94-0267 was written on March 22, 1994 by the Electrical Engineering group when the potential for a single failure of the fire protection system (KP) deluge relay to cause a loss of the lower electrical cable tunnel exhaust fans 31 and 32 was identified. The extent of condition for this DER included a review of other Quality Assurance (QA) Category I buildings, including the switchgear room. The review identified the potential for the CO₂ fire protection relay failure to cause loss of the two switchgear room fans and identified the event in a memorandum on April 13, 1994. This memorandum, written in response to DER 94-0267, noted that heating ventilation and air conditioning (HVAC) (VI) upgrade efforts by System Engineering for the switchgear room were to include a review of single failure vulnerabilities. The upgrade was an action related to LER 93-048

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which reported the potential for a single electrical failure to cause loss of switchgear room exhaust fans 33 and 34 due to the original non-safety related design. The upgrade did not include the CO₂ interface relay because it was outside the system boundary, but the design engineers identified the CO₂ relay as a single failure component of the system during the design of the modifications to separate the power feeds to ventilation exhaust fans 33 and 34. No immediate corrective action was taken when the failure mechanism was identified in either assessment because each group thought the other was to address the concern. As a result, the issue was not tracked and, because of the lack of tracking, LER 93-048-02, issued July 30, 1994, reported that no further modifications were required to address the extent of condition. The event in this LER 95-003-00 was reported as a 4 hour event after the miscommunication was identified.

CAUSE OF THE EVENT

The cause of the event was due to inadequate analysis associated with the original plant design. The original design did not identify that a failure of the switchgear room ventilation system could have affected the operability of the 480VAC switchgear. The original analysis classified the switchgear room ventilation system as QA Non-Category I and no provisions were made to mitigate the effects of single failure vulnerabilities.

CORRECTIVE ACTIONS

The following corrective actions have been or will be performed in order to address the deficiencies identified during the investigation of this event and in previous event associated with this system (see LER 93-048-02) to prevent recurrence:

- A modification, MMP 94-03-055 CBHV, was installed to provide a control room alarm for Control Building 15' elevation and 33' elevation high ambient temperatures. An Alarm Response Procedure (ARP-13) was developed to identify responses for addressing Control Building 15' elevation switchgear room and Control Building 33' elevation high ambient temperatures in order to maintain the temperatures below the design values.

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- A modification, MMP 95-03-056 CBHV, will be installed to preclude a single failure from causing a loss of ventilation exhaust fans 33 and 34. This modification will be completed prior to plant startup.
- The Action Commitment Tracking System, which was being phased into the plant processes at the time of initial discovery of the design deficiency, should preclude the failure to track items such as the need to correct the potential single failure mechanisms affecting the 480VAC switchgear room ventilation system.
- The safety significance for this event, when previous plant operation was above cold shutdown and prior to installing the switchgear room temperature indicator, is under investigation and will be reported in a supplement.
- The New York Power Authority (NYPA) is continuing its investigation into the reasons for the delay in addressing the event reported in LER 95-003-00 to determine if additional action is warranted. This is scheduled for completion by May 5, 1995.

ANALYSIS OF THE EVENT

This event is reportable under 10 CFR 50.73(a)(2)(ii)(A) and 10 CFR 50.73(a)(2)(ii)(B). A single failure of the Control Building 15' elevation 480VAC vital switchgear room ventilation system could result in temperatures exceeding analyzed conditions. This could have placed the plant outside of the design basis. The system was initially designed as seismic class I, non-safety related. Ventilation exhaust fans 33 and 34 are not full capacity and relied on two contacts from the same relay in the control circuitry to provide a fan run permissive from the CO₂ fire protection system. A single failure of a CO₂ relay could have resulted in the loss of ventilation exhaust fans 33 and 34.

Similar events (single failure which had not been incorporated into the plant's HVAC design where required) were reported in LERs 93-048-02 and 94-006-01.

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SAFETY SIGNIFICANCE

This event identifies the potential loss of Control Building 15' elevation ventilation due to a failure of ventilation exhaust fan control components with or without a coincident safety injection (SI) signal. The failure of ventilation in the Control Building 15' elevation could result in complete or partial loss of vital safety related 480VAC switchgear due to high temperatures, if a design basis accident with offsite power available, were to occur.

The safety significance was evaluated by looking at the actual and potential implications of the event. There was no actual safety significance because there was no loss of ventilation. The potential safety significance was assessed for design basis conditions.

In the time period between the discovery of this event and this report, the safety significance was minimal because the plant was and still is in the cold shutdown condition. The potential for a high heat input from the 480VAC switchgear under SI conditions is not credible when the plant is in cold shutdown (most of the equipment is not operable). If the deficiency had not been identified prior to bringing the plant above cold shutdown, then temperature sensors installed this outage (October 28, 1994) in the switchgear room would have initiated a Control Room alarm in the event of high switchgear room temperature. Alarm Response Procedure (ARP)-13 has been in place since the installation of this modification and describes compensatory measures to mitigate high temperatures in the 15' elevation Control Building.

The safety significance for this event, when previous plant operation was above cold shutdown and prior to installing the switchgear room temperature indicator, is under investigation and will be reported in a supplement.

Other ventilation systems affecting QA Category I buildings were reviewed for single failure mechanisms as part of the resolution of DER 94-0267. Modifications and/or analyses were performed to resolve the ventilation related single failure issues for QA Category I areas, except for the switchgear room which is addressed in this LER.