Indian Point 3
Nuclear Power Plant
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New York Power Authority

John H. Garrity
Resident Manager

November 8, 1993
IPN-93-137

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

Subject: Indian Point 3 Nuclear Power Plant
Docket No. 50-286
Licensee Event Report 93-042-00
"Emergency Diesel Generators Inoperable, Placing the Plant Outside Technical Specification Requirements, Due to Personnel Error"

Dear Sir:

The attached Licensee Event Report (LER) 93-042-00 is hereby submitted in accordance with the requirements of 10CFR50.73. This event is of the type defined in the requirements pursuant to 10 CFR 50.73(a)(2)(i)(B). Also attached are the commitments made by the Authority in this LER.

Very truly yours,

J H Garrity

John H. Garrity
Resident Manager
Indian Point Three Nuclear Power Plant

JHG/JC/vjm

cc: See next page

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

Attachment
List of Commitments

Number	Commitment	Due
IPN-93-137-01	DEM 93-3-244 480v shall be revised to incorporate more adequate testing requirements. Until this corrective action is completed, the performance testing group of Technical Services will ensure proper testing is done when any thermal overload is installed per DEM 93-3-244 480 v.	Prior to plant startup
IPN-93-137-02	A preventive maintenance program for motors will be established, and evaluation of necessary parameters for trending will be addressed as part of the program.	December 1994
IPN-93-137-03	Upon the conclusion of testing and analysis, the site engineering department will complete a modification to assure that EDG ventilation system fan and motor performance are in accordance with design basis.	Prior to plant startup
IPN-93-137-04	The Modification Control Manual will be revised to require that modifications identify the safety function(s) of the equipment being worked on and that post-modification testing identified in the modification verifies the function(s).	Prior to plant startup

NRC FORM 366 (5-92) U.S. NUCLEAR REGULATORY COMMISSION

APPROVED BY OMB NO. 3150-0104
EXPIRES 5/31/95

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 (MNBB 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.

LICENSEE EVENT REPORT (LER)

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

FACILITY NAME (1)	DOCKET NUMBER (2)	PAGE (3)
Indian Point Unit 3	05000286	1 OF 6

TITLE (4) Emergency Diesel Generators Inoperable, Placing the Plant Outside Technical Specification Requirements, Due to Personnel Error

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	09	93	93	-- 042 --	00	11	08	93		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)

	20.402(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
	20.405(a)(1)(iii)	✓	50.73(a)(2)(i)		50.73(a)(2)(viii)(A)		(Specify in Abstract below and in Text, NRC Form 366A)
	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)		

LICENSEE CONTACT FOR THIS LER (12)

NAME	TELEPHONE NUMBER (Include Area Code)
Nabil Yacoub, Supervisory System Engineer	(914) 736-8879

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
	YES (If yes, complete EXPECTED SUBMISSION DATE).	X NO				

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

On October 9, 1993 at 1915 hours, with the plant in cold shutdown, a Senior Reactor Operator (SRO) declared all three Emergency Diesel Generators (EDGs) inoperable. The SRO made this operability determination because EDG ventilation fans in an EDG compartment were tripping on thermal overload. The fans are part of the EDG ventilation system which is required as a support system for the EDGs. The cause of the event was personnel error in that a modification implemented to replace the fan motor overloads failed to include adequate overload testing requirements. Investigation results indicate that the plant was outside Technical Specification 3.7.F.4, requiring a minimum of two operable diesels, between September 20, 1993 at 0341 hours until October 8, 1993 at 1040 hours. Corrective actions include revising the modification, communicating lessons learned to engineering departments, establishing a preventive maintenance program for motors, and revising the Modification Control Manual. Prior to plant startup, a modification will be completed to assure that EDG ventilation fan and motor performance are in accordance with design basis.

DESCRIPTION OF THE EVENT

On October 9, 1993, at 1915 hours with the plant in cold shutdown (reactor power level at 12 cps, reactor coolant temperature at 107 degrees F, reactor coolant pressure at atmospheric pressure, and pressurizer level at 26%) the senior reactor operator declared all three Emergency Diesel Generators (EK)(DG) inoperable after finding 5 out of 6 Emergency Diesel Generator (EDG) compartment ventilation fans (FAN), which are support systems, inoperable based on the current drawn exceeding rated value.

At Indian Point 3 (IP3), there are 3 Emergency Diesel Generators in three separate cells. Each cell is ventilated by redundant exhaust fans to remove the heat when the generators are running. Fans 314 and 315 serve EDG 31, fans 316 and 317 serve EDG 32, and fans 318 and 319 serve EDG 33. In July 1993, during trouble shooting activities of EDG exhaust fan 318, engineering identified improperly sized overloads for the horsepower rating of the fan motors. In August 1993, Engineering added the sizing of the fan motors overloads to Design Equivalent Modification (DEM 93-3-244 480v) in accordance with the specific motor's name plate data and Maintenance personnel replaced the overloads in all the fans except 319 on EDG 33. On October 8 and 9, 1993, exhaust fans 314 and 315 tripped, respectively, during normal operations. As a result, current measurements were taken by Operations personnel that indicated that the current drawn by the motors exceeds the motor design rating by approximately 15% on all fan motors except for fan 317. Based on the measured current drawn by the fan motor being greater than design, all three EDGs were declared inoperable on October 9, 1993. Contingency actions were prescribed by a night order 93-313, dated October 10, 1993, included limiting the running time of the exhaust fan to 10 minutes and blocking the doors open should the fans fail. Operations issued a Significant Occurrence Report 93-620 and, at this time, offsite power and EDGs 32 and 33 were considered available.

On October 15, 1993, Engineering concluded that Technical Specification 3.7.F.4 requiring a minimum of two operable diesel generators, was violated from September 20, 1993 to October 8, 1993 during which time EDGs 31 and 32 were inoperable. EDG 32 was out of service on September 2, 1993 and associated fan 317 was taken out of service the following day for replacement. On September 19, 1993, EDG 32 was returned to service with the replacement of fan 317 incomplete. On September 20, 1993, at 0341, EDG 31 was taken out of service for maintenance activities before the declaration of fan 317 operability on October 8, 1993. If required to run, exhaust fan 316 would have tripped leaving EDG 32 without any operable ventilation fan thus rendering EDG 32 inoperable. Therefore, the plant was outside its Technical Specification requirements for having two EDGs, 31 and 32, out of service during the period extending from September 20, 1993 at 0341 hours until October 8, 1993 at 1040 hours.

Immediate corrective action included temporary modifications and a safety evaluation to raise the overload setting on all the replaced overloads except 318. This allowed EDGs 32 and 33 to be declared operable on October 10, 1993 at 1130 hours. To evaluate the extent of this condition, Engineering identified the other plant loads where old overload heaters were replaced under the same modification. Twenty one motor loads on the 480 volt system were identified. Testing of 18 motor loads (3 were out of service) proved that this condition is particular to the EDG ventilation system exhaust fans.

Engineering efforts started concurrently with the temporary modifications and safety evaluation to determine the cause of this event. Design basis research was conducted along with initial system performance testing. Test data collected during the trouble shooting activities indicated higher currents on all fan motors except the new motors for fans 314 and 317. As part of the engineering effort, the overall ventilation system performance is being evaluated.

Exhaust fan 314 motor was replaced. The old motor is being sent to a specialized motor testing shop to determine, by test, the cause of the motor's excessive current. Engineering is continuing to evaluate the design adequacy and if these efforts invalidate the conclusions presented here, the Authority will provide a supplement to this LER.

CAUSE OF THE EVENT

This event was caused by personnel error due to inadequate investigation prior to implementing a change of the overload heater and inadequate design testing specified in the engineering design document which was based on a misunderstanding as to the function of the motor protective scheme.

Contributing causes to this event are as follows:

- Human error, manifested by inadequate work practice, and not following procedures, that resulted in the undocumented installation of the oversized thermal overloads, at an indeterminate time in the past.
- A lack of a questioning attitude when the old overloads were found oversized.
- Preventive maintenance procedures for motors do not contain measurement of current and voltage that can be used for performance trending.

Preliminary indications show that the choice of the fan motor did not allow for design margin; however, engineering evaluation has not been completed to date.

CORRECTIVE ACTIONS

The following corrective actions have been or will be performed in order to prevent recurrence of this event.

- DEM 93-3-244 480v shall be revised to incorporate more adequate testing requirements. This corrective action will be completed prior to plant startup. Until this corrective action is completed, the performance testing group of Technical Services will ensure proper testing is done when any thermal overload is installed per DEM 93-3-244 480v.
- Lessons learned have been communicated to site and system engineering personnel to stress a questioning attitude that engineers must have and the importance of testing requirements that adequately test the function of the installed component. This corrective action was completed on October 28, 1993.

- A preventive maintenance program for motors will be established, and evaluation of necessary parameters for trending will be addressed as part of the program. This corrective action will be completed by December 1994.

- Upon the conclusion of testing and analysis, the site engineering department will complete a modification to assure that EDG ventilation system fan and motor performance are in accordance with design basis. This corrective action will be completed prior to plant startup.

- The Modification Control Manual will be revised to require that modifications identify the safety function(s) of the equipment being worked on and that post-modification testing identified in the modification verifies the function(s). This corrective action will be completed prior to plant startup.

Engineering continues to evaluate the EDG cell ventilation system adequacy and should these efforts invalidate the conclusions presented here, the Authority will provide a supplement to this LER.

ANALYSIS OF THE EVENT

This event is reportable under 10 CFR 50.73(a)(2)(i)(B). The licensee shall report any operation or condition prohibited by the plant's technical specifications. Technical Specification 3.7.F.4 requires that under all conditions, including cold shutdown, a minimum of two diesel generators be operable. IP3 was in a condition prohibited by this requirement between September 20, 1993 at 0341 hours and October 8, 1993 at 1040 hours when EDG 31 and EDG 32 were inoperable.

Similar events were recently reported when procedures or activities did not properly consider technical specification requirements. LER 93-005-03 identified the deficiency of modification acceptance testing of AMSAC. The LER reported that dynamic testing was needed in addition to static testing to completely determine the required system outputs.

SAFETY SIGNIFICANCE

This event had no significant effect on the health and safety of the public. Technical Specification 3.7.F.4 requires a minimum of two operable diesel generators while the plant is in cold shutdown. This requirement was not met for the period extending from September 20, 1993 at 0341 hours until October 8, 1993 at 1040 hours during which EDG 31 was out of service and EDG 32 did not have its ventilation system operable.

Technical Specifications 3.7.C.2 requires that if the reactor is subcritical, then the reactor coolant system temperature and pressure shall not be increased more than 25 degrees F and 100 psi, respectively, over existing values. This requirement was complied with. The plant being in a cold shutdown condition reduces the possibility of an accident that would release fission products or damage the fuel elements and the consequences of it.

A hypothetical loss of offsite power coincident with the loss of a diesel would have been mitigated by the operation of EDG 33 which remained operable between September 20 and October 8, 1993.

The diesel generator would have provided for decay heat removal by Residual Heat Removal Pump 31, Component Cooling Pump 31, and Service Water Pump 31. These components were verified to be operable for the period of concern.