

Paul H. Kinkel
Vice President

Consolidated Edison Company of New York, Inc.
Indian Point Station
Broadway & Bleakley Avenue
Buchanan, NY 10511
Telephone (914) 734-5340
Fax: (914) 734-5923

June 22, 1998

Re: Indian Point Unit No. 2
Docket No. 50-247
LER 98-007-00

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

The attached Licensee Event Report 98-007-00 is hereby submitted in accordance with the requirements of 10 CFR 50.73.

Very truly yours,

Paul H. Kinkel

Attachment

cc: Mr. Hubert J. Miller
Regional Administrator - Region I
US Nuclear Regulatory Commission
475 Allendale Road
King of Prussia, PA 19406

Mr. Jefferey Harold, 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
Buchanan, NY 10511

4/1
JE22

9806290166 980622
PDR ADOCK 05000247
S PDR

LICENSEE EVENT REPORT (LER)

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

ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS MANDATORY INFORMATION COLLECTION REQUEST: 50.0 HRS. REPORTED LESSONS LEARNED ARE INCORPORATED INTO THE LICENSING PROCESS AND FED BACK TO INDUSTRY. FORWARD COMMENTS REGARDING BURDEN ESTIMATE TO THE INFORMATION AND RECORDS MANAGEMENT BRANCH (T-6 F33), U.S. NUCLEAR REGULATORY COMMISSION, WASHINGTON, DC 20555-0001, AND TO THE PAPERWORK REDUCTION PROJECT

FACILITY NAME (1) Indian Point No. 2		DOCKET NUMBER (2) 05000-247	PAGE (3) 1 OF 4
---	--	--------------------------------	--------------------

TITLE (4)
Failure of Gas Turbine Output Breaker to Close onto a De-energized Bus

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
05	22	1998	1998	007	00	06	22	1998		05000
										05000

OPERATING MODE (9) N	THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more) (11)									
POWER LEVEL (10) 0	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)	X 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 James J. Maylath	TELEPHONE NUMBER (Include Area Code) (914) 734-5356
--------------------------	--

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
D	EA	CPU	W290	Y					
E	EA	CPU	W290	Y					

SUPPLEMENTAL REPORT EXPECTED (14)

<input checked="" type="checkbox"/> YES (If yes, complete EXPECTED SUBMISSION DATE).	NO	EXPECTED SUBMISSION DATE (15)	MONTH 10	DAY 30	YEAR 1998
---	----	-------------------------------	-------------	-----------	--------------

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

On May 22, 1998, with the unit at cold shutdown, during phase testing of the Gas Turbine No. 3 (GT3) control wiring, it was determined that the GT3 breaker was not capable of being closed onto a de-energized bus. GT3 is one of three gas turbines that comprise the Alternate AC System for Indian Point No.2 under the Station Blackout Rule. Following this event, the GT3 output breaker controls were modified, and the GT3 output breaker was successfully closed onto a de-energized bus. Previous testing under the Station Blackout Rule provided for starting each gas turbine with a black start diesel and no other external power supplying the gas turbine auxiliaries. However, this testing provided for synchronizing the gas turbine output to an energized bus. Only one gas turbine, GT1, has previously been tested where the output breaker was closed to a de-energized bus. This test was performed following a modification on the gas turbine output breaker controls. A similar test was performed on GT2 on June 16, 1998, and it was determined that the GT2 breaker was also not capable of being closed onto a de-energized bus. The GT2 output breaker controls were then modified, and the GT2 output breaker was successfully closed onto a de-energized bus. These events were caused by the gas turbines control system configuration, which was not common for GT2 and GT3, preventing the closure of the output breaker to a de-energized bus. The root cause of not detecting these configurations was determined to be an insufficiently comprehensive test for detecting anomalies in the gas turbine control system.

LICENSEE EVENT REPORT (LER)
TEXT CONTINUATION

FACILITY NAME (1)	DOCKET	LER NUMBER (6)			PAGE (3)	
Indian Point No. 2	05000-247	YEAR	SEQUENTIAL NUMBER	REVISION	2	OF 4
		1998	-- 007	-- 00		

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

PLANT AND SYSTEM IDENTIFICATION:

Westinghouse 4-Loop Pressurized Water Reactor

IDENTIFICATION OF OCCURRENCE:

Failure of Gas Turbine Output Breaker to Close onto a De-energized Bus

EVENT DATE:

May 22, 1998

REPORT DUE DATE:

June 22, 1998

REFERENCES:

Condition Identification and Tracking System (CITRS) No. 98-E04377 and 98-E04389

PAST SIMILAR OCCURRENCE:

None.

DESCRIPTION OF OCCURRENCE:

On May 22, 1998, with the unit at cold shutdown, during phase testing of the Gas Turbine No. 3 (GT3) control wiring, the GT3 breaker was determined to be incapable of being closed onto a de-energized bus. This testing was being performed following a modification on the gas turbine output breaker synchronizing circuit. GT3 is one of three gas turbines that comprise the Alternate AC System for Indian Point No.2 under the Station Blackout Rule. Previous testing under the Station Blackout Rule provided for starting each gas turbine with a black start diesel and no other external power supplying the gas turbine auxiliaries. However, this testing provided for synchronizing the gas turbine output to an energized bus. Only GT1 had been tested for closure of its output breaker to a de-energized bus. This test had been performed, during November 1995, following a modification that added a second potential transformer (PT) set on the 13.8 kV bus associated with the output of GT1. A similar modification had been performed on GT3 prior to the modification on GT1. However, there is no record of similar testing being performed on GT3.

Subsequent to the May 22, 1998 event, GT3 was successfully tested for closure of its output breaker to a de-energized bus. A test of GT2 for closure of its output breaker to a de-energized bus was performed on June 16, 1998. The GT2 output breaker also failed to close onto its associated de-energized bus. Subsequent to this failure, GT3 was successfully tested for closure of its output breaker to a de-energized bus.

LICENSEE EVENT REPORT (LER)
TEXT CONTINUATION

FACILITY NAME (1)	DOCKET	LER NUMBER (6)			PAGE (3)	
		YEAR	SEQUENTIAL NUMBER	REVISION		
Indian Point No. 2	05000-247	1998	007	00	3	OF 4

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

ANALYSIS OF OCCURRENCE:

This report is being submitted in accordance with 10CFR50.73(a)(2)(ii) for a condition that is outside the plant design basis. This plant condition, as discovered, could have resulted in the Alternate AC (AAC) System not being capable of powering the shutdown (480 V) buses as stated in the NRC letters, dated November 21, 1991, "Safety Evaluation of the Indian Point Nuclear Generating Unit No. 2, Response to the Station Blackout Rule (TAC No. M68556)" and June 4, 1992, "Supplemental Safety Evaluation of Indian Point Nuclear Generating Unit No. 2, Response to the Station Blackout Rule (TAC No. M68556)." The AAC System consists of three gas turbines. At least one gas turbine and one blackstart diesel and associated switchgear (for connection to, as well as picking up load on the 480 V buses) must be operable for the AAC System to be considered operable.

The initial blackstart tests, which were performed in 1993, provided for starting each gas turbine from a blackstart diesel with no external power supplied to the gas turbine auxiliaries. Following the start of each gas turbine, the gas turbine output breaker was closed onto its associated 13.8 kV bus which was energized. As these breakers closed when required during the initial tests, the breaker operation was considered successful. At that time, the present Woodward Control System had not yet been installed on any of the three gas turbines.

Since November 21, 1993, when the AAC System was required to be operable, there have been no station blackout events at Indian Point No. 2. This event did not result in any injuries to personnel or damage to equipment.

CAUSE OF OCCURRENCE:

The failure of the GT3 output breaker to close onto a de-energized bus was caused by two factors. The "dead bus closure" selection on the GT3 Woodward Control System was not configured for the proper communication path with the system computer logic. In addition, one of the three voltage transducers that communicates the "dead bus" signal to the GT3 Woodward Control System was reading 0.5 VAC on C-phase. All three voltage transducers must read 0 VAC to communicate a "dead bus" signal to the Woodward Control System and permit output breaker closure.

The failure of the GT2 output breaker to close onto a de-energized bus was caused by a software configuration in its Woodward Control System that would not permit closure of the GT2 output breaker without sensing voltage on the bus associated with the gas turbine. The conditions of the failures of the output breaker to close onto a de-energized bus for GT2 and GT3 were not common to both gas turbines and were apparently present since the Woodward Control Systems were installed in 1994. The root cause of these conditions not being detected was the lack of a sufficiently comprehensive test of the starting and loading of the gas turbines both with and without external power (associated bus de-energized) following the installation of the Woodward Control Systems on GT2 and GT3 and the PT set on GT3. GT1 had been tested successfully for closure of its output breaker to a de-energized bus following installation of the second PT set in November 1995.

LICENSEE EVENT REPORT (LER)
TEXT CONTINUATION

FACILITY NAME (1)	DOCKET	LER NUMBER (6)			PAGE (3)	
		YEAR	SEQUENTIAL NUMBER	REVISION		
Indian Point No. 2	05000-247	1998	-- 007	-- 00	4	OF 4

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

CORRECTIVE ACTION:

Following the May 22, 1998 event, a temporary procedure change was implemented to allow the Operator to disconnect the output breaker connection to the Woodward Control System. With this change, the output breaker was successfully closed onto its associated de-energized bus, and the gas turbine was capable of being manually loaded. The Woodward Control System has since been corrected, and GT3 has been started and connected to its associated de-energized bus with the Woodward Control System.

A test of GT2 for closure of its output breaker to a de-energized bus was also performed and was not successful. The Woodward Control System for GT2 was investigated for reconfiguration of the software to permit closure of the GT2 output breaker to a de-energized bus. The GT2 Woodward Control System software had used bus voltage as a permissive for opening the gas turbine fuel valve, as well as the output breaker. This was to assure that the machine was properly excited and had load to be assumed prior to admitting additional fuel to the machine. The GT2 Woodward Control System software was changed to permit closure of the GT2 output breaker to a de-energized bus. The source for determination of proper machine excitation by the Woodward Control System software was changed to the DC source that supplies the exciter. Upon completion of these changes, GT3 was started and connected to its associated de-energized bus with the Woodward Control System. GT1 had been tested successfully for closure of its output breaker to a de-energized bus during November 1995. In addition, a modification is being performed on all three gas turbines that provides for approximately +/-5 VAC tolerance (there was previously no tolerance) on the voltage transducers that communicate the "dead bus" signal to the Woodward Control System. This will enhance communication of a "dead bus" signal to the Woodward Control System and assure output breaker closure when required.

The initial tests performed on all three gas turbines in 1993 under the Station Blackout Rule, which did not provide for closure of the output breaker to a de-energized bus, will be reviewed to determine if the closure of the output breaker to a de-energized bus has any impact on the time measurements taken during these initial tests. Also, the breaker control designs at the time of the initial tests will be reviewed to determine if any condition existed which would have prevented these breakers from closing onto a de-energized bus (these breakers were successfully closed to an energized bus during the initial tests).