NRC Form 366
(9-83)

U.S. NUCLEAR REGULATORY COMMISSION

LICENSEE EVENT REPORT (LER)

APPROVED OMB NO. 3150-0104
EXPIRES: 8/31/85

FACILITY NAME (1): INDIAN POINT UNIT 2

DOCKET NUMBER (2): 0 5 0 0 0 2 4 7

PAGE (3): 1 OF 0 4

TITLE (4): Reactor Trip - Low Reactor Coolant Flow Signals

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 2	1 2	8 5	8 5	0 1 6	0 1	0 2	0 5	8 6		0 5 0 0 0
										0 5 0 0 0

OPERATING MODE (9): 1

POWER LEVEL (10): 1 0 0

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)	X 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)	

LICENSEE CONTACT FOR THIS LER (12)

NAME: JOHN ELLWANGER

TELEPHONE NUMBER: AREA CODE 9 1 1 4 — 5 2 1 6 - 1 5 1 8 1 2

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
B	A B	C A 2	W 1 8 0	Y					
B	B A	R L Y	W D 1 1 5	Y					

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 fifteen single-space typewritten lines) (16)

On December 12, 1985 at 6:37 AM a reactor trip occurred due to inadvertent loss of reactor coolant flow signals from reactor coolant loop #21. During recovery activities, the 6.9 KV power supply to the station's 6.9 KV buses was inadvertently interrupted at 8:00 AM. The 6.9 KV power was reconnected at 8:20 AM. Concurrently, several automatic trips of #23 Auxiliary Feedwater Pump were experienced and the pump was declared inoperable at 10:30 AM. The pump was returned to operable status at 5:25 PM.

The cause of the low flow signal was a failed bistable in one instrument channel, coincident with a signal from a separate low flow instrument channel, which had been previously placed in the tripped position. The interruption in 6.9 KV power was due to physical tapping of a relay box which actuated a relay. The unavailability of the auxiliary feedwater pump was due to a failed relay which was replaced.

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Plant and System Identification:

Westinghouse 4-loop pressurized water reactor; 900 MWe.

Identification of Occurrence:

Reactor trip due to coincident low reactor coolant flow signals.

Event Date:

December 12, 1985

Reportability Determination Date:

December 12, 1985

Original Report Due Date:

January 11, 1986

Similar Occurrences:

A Unit trip occurred on August 6, 1983 when a failed capacitor, similar to that of the low reactor coolant flow instrument channel, resulted in a false containment high pressure signal while one channel was in the test position. This event was reported in accordance with the requirements of 10 CFR 50.72.

Description of Occurrence:

Prior to the event, the unit had been at 100% power with reactor coolant loop 21 low flow instrument channel FT 415 in the tripped position. At 6:35 AM low flow channel FT 416, which also monitors flow on loop 21, tripped. This provided the 2 out of 3 coincidences necessary to cause a reactor trip followed by a turbine/generator trip. All Reactor Protection System equipment functioned normally and a normal trip recovery was in process. A Control Room operator began to investigate a 345 KV pilot wire trouble alarm that actuated after the generator trip. The operator found a contact actuated on a pilot wire relay and attempted to clear the contact by tapping on the relay cover. The adjacent relay was inadvertently actuated by this tapping action, which in turn tripped a second relay. The second relay tripped the 6.9 KV power breakers, de-energizing all 6.9 KV and 480 V buses. Although offsite power was still available, the inadvertent tripping of the 6.9 KV power breakers

started the diesel generators and re-established power to the 480 V safeguard buses. Natural circulation was established within the Reactor Coolant System. The relay was reset and the 6.9 KV power breakers were closed at 8:20 AM. At 8:35 AM, #24 Reactor Coolant Pump was started to established forced cooling in the reactor coolant system. During this recovery period, #23 Auxiliary Feedwater Pump tripped several times after being manually reset. At 10:30 AM the pump was declared inoperable. Other auxiliary equipment was energized and no malfunctions were observed.

The bistable on the low flow reactor coolant channel was repaired. A relay was replaced in the circuitry provided to trip the Auxiliary Feedwater Pumps when low suction flow exists. The reactor was subsequently brought critical on December 12, 1985 at 11:30 PM.

Analysis of Occurrence:

The Reactor Protection System functioned properly at the time of the trip. Auxiliary Feedwater Pump #23 is a motor driven pump. Despite its unavailability, the motor driven #21 Auxiliary Feedwater Pump and the steam driven #22 Auxiliary Feedwater Pump remained operable. Either pump would have sufficed for the purpose of decay heat removal, and number 22 pump was utilized for this purpose. Accordingly, there was no threat to the public health and safety.

The separation of the 6.9 KV supply from the 6.9 KV buses did not result in the unavailability of offsite power. The station auxiliary transformer and many other sources of on-site and offsite station power were available even though the diesel generators were operating. We note that Draft NUREG-1032 "Evaluation of Station Blackout Accidents at Nuclear Power Plants" could be interpreted to classify this event as a "loss of offsite power" event. However, with the availability of an on-site gas turbine and the many intact sources of offsite power, sufficient 6.9 KV power was retained at all times during the occurrence.

Cause of Occurrence:

The failure of the bistable in the reactor coolant "low flow" instrument channel was investigated and found to be due to a failed capacitor and transformer in the bistable circuit. The bistable is a Foxboro model No. 63S-AR-0AHA.

The relays associated with the interruption of 6.9 KV power were investigated and no failures were detected. This part of the event is attributed to operator error, in tapping the relay cover.

The relay on the Auxiliary Feedwater Pump was investigated and an open coil was detected. The relay is a Magnacraft Electric model W88X-9.

Corrective Action:

A program is being implemented to replace capacitors within engineered safeguards bistables which are considered to be in a "high stress" environment. The replacement is being done on a gradual basis during regularly scheduled surveillance tests.

A failure analysis has been performed on the low suction flow relay to assess the electrical and mechanical performance of this relay. The results of this analysis indicate that the relay should be replaced. Consideration is being given to replacement of the entire transmitter.

The Operations staff has been instructed to refer all relay maintenance and investigation to the on-site Instrument and Control (I&C) section. This responsibility is covered under an I&C procedure.

John D. O'Toole
Vice President

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February 5, 1986

Re: Indian Point Unit No. 2
Docket No. 50-247
LER-85-016-01

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

Dear Sirs:

Transmitted herewith is an update to Licensee Event Report LER-85-016.

Very truly yours,

John D. O'Toole

attach.
cc: Dr. Thomas E. Murley,
Regional Administrator-Region I
U. S. Nuclear Regulatory Commission
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