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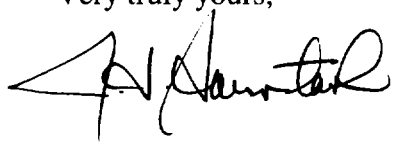
October 18, 1999

Re: Indian Point Unit No. 2
Docket No. 50-247
LER 99-16-00

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

The attached Licensee Event Report 99-16-00 is hereby submitted in accordance with the requirements of 10 CFR 50.73.

Very truly yours,



Attachment

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

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US Nuclear Regulatory Commission
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NRC FORM 366 (6-1998) U.S. NUCLEAR REGULATORY COMMISSION

APPROVED BY OMB NO. 3150-0104 EXPIRES 06/30/2001

Estimated burden per response to comply with this mandatory information collection request: 50 hrs. Reported lessons learned are incorporated into the licensing process and fed back to industry. Forward comments regarding burden estimate to the Records Management Branch (T-6 F33), 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. If an information collection does not display a currently valid OMB control number, the NRC may not conduct or sponsor, and a person is not required to respond to, the information collection.

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 No. 2	05000-247	1 OF 5

TITLE (4)

Engineering review of field condition revealed a missing jumper wire.

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
9	17	1999	1999	-- 16 --	0	10	18	1999		05000
									FACILITY NAME	DOCKET NUMBER
										05000

OPERATING MODE (9)	N
POWER LEVEL (10)	0

THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more) (11)

	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	TELEPHONE NUMBER (Include Area Code)
John Beck, Senior Licensing Engineer	(914) 734-5692

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

SUPPLEMENTAL REPORT EXPECTED (14)				EXPECTED SUBMISSION DATE (15)	MONTH	DAY	YEAR
X	YES (If yes, complete EXPECTED SUBMISSION DATE).		NO		12	20	1999

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

On September 15, 1999 during the installation of a modification to the facility, consisting of new timing relays in a Motor Driven Auxiliary Feedwater Pump breaker control circuit, variations between the design documents and the actual field conditions were discovered. Specifically, jumper wires indicated on the design drawings did not physically exist in the installed circuitry for the two Motor Driven Auxiliary Feedwater Pumps. A preliminary investigation determined that this condition could have rendered the automatic start feature from the breaker control circuitry to the 21 Auxiliary Feed Water Pump (21AFWP) inoperable during certain scenarios. Specifically, in the event of a loss of power to 480 VAC bus 3A only, the "anti-pump" feature of the 21AFWP breaker would require operator action to start the pump for a low-low steam generator water level signal or an Anticipated Transient Without Scram (ATWS) Mitigation System Actuation Circuitry (AMSAC) signal. The circuitry for all of the automatic start features for the 23 Motor Driven Auxiliary Feedwater Pump remained operable. Further, the automatic start features for both Motor Driven Auxiliary Feedwater Pumps remained operable for both Safety Injection (SI) and reactor trip with station blackout signals.

PLANT AND SYSTEM IDENTIFICATION:

Westinghouse 4-Loop Pressurized Water Reactor

IDENTIFICATION OF OCCURRENCE:

Engineering review of field condition revealed a missing jumper wire

EVENT DATE:

September 17, 1999

REPORT DUE DATE:

October 18, 1999

REFERENCES:

Condition Reporting System (CRS) Numbers 199906975, and 199907082.

PAST SIMILAR OCCURRENCE:

None

DESCRIPTION OF OCCURRENCE:

On September 15, 1999 during the installation of a modification to the facility, consisting of new timing relays in a Motor Driven Auxiliary Feedwater Pump breaker control circuit, variations between the design documents and the actual field conditions were discovered. Specifically, jumper wires indicated on the design drawings did not physically exist in the installed circuitry for the two Motor Driven Auxiliary Feedwater Pumps. A preliminary investigation determined that this condition could have rendered the automatic start feature from the breaker control circuitry to the 21 Auxiliary Feed Water Pump (21AFWP) inoperable during certain scenarios. Specifically, in the event of a loss of power to 480 VAC

DESCRIPTION OF OCCURRENCE(Continued):

bus 3A only, the "anti-pump" feature of the 21AFWP breaker would require operator action to start the pump for a low-low steam generator water level signal or an Anticipated Transient Without Scram (ATWS) Mitigation System Actuation Circuitry (AMSAC) signal. The circuitry for all of the automatic start features for the 23 Motor Driven Auxiliary Feedwater Pump remained operable. Further, the automatic start features for both Motor Driven Auxiliary Feedwater Pumps remained operable for both Safety Injection (SI) and reactor trip with Station Blackout (SBO) signals.

The requirements specified in the May 16, 1989 Safety Evaluation Report (SER) "Equipment, diverse from the Reactor Trip System (RTS), is required to initiate the Auxiliary Feedwater (AFW) System and a turbine trip for ATWS events", may not have been fully met for 21AFWP.

This event was discovered while the plant was in hot shutdown. A 10 CFR 50.72 report was made at approximately 15:28 hours on September 17, 1999.

The specific plant conditions that would have had to exist for the 21AFWP to not automatically start are: loss of power to 480 VAC bus 3A, no black out signal or Safety Injection (SI) signal present, and an Anticipated Transients Without Scram (ATWS) Mitigating System Actuation Circuitry (AMSAC) condition consisting of a 5 to 8 percent level in 3 out of the 4 steam generators. The same conditions that prevent automatic pump start for AMSAC would prevent an auto-start on low-low steam generator water level.

Because loss of off-site power is not sensed by 480VAC bus 3A, a loss of 480VAC bus 3A alone would cause all of the EDG's to start but they would not strip and pick up loads on their respective buses. Therefore, loss of power supply to 480 VAC bus 3A without a blackout signal (which is generated on a loss of power to 480VAC bus 5A or 6A) and with or without a unit trip would require operator action to re-energize 480VAC bus 3A via 22EDG prior to starting 21AFWP following an ATWS Mitigating System Actuation Circuitry (AMSAC) signal.

With the jumper wire in place as designed, only one operator action to load 480 VAC bus 3A onto 22EDG would be required during an AMSAC condition. With the missing AMSAC jumper wire scheme, the additional operator action that would be necessary is to start the 21AFWP by turning its control switch to "Trip" to open the closing circuit to clear the breaker anti-pump circuitry and then to "Close" to start the pump. Accordingly, the 21AFWP would have failed to automatically start if the following conditions had existed: 480 VAC bus

DESCRIPTION OF OCCURRENCE (Continued):

3A loss of power, no black out (no loss of power to 480 VAC bus 5A or 6A) condition or no Safety Injection (SI) signal, and an AMSAC signal present.

Consequently, the requirements specified in the Safety Evaluation Report (SER) dated May 16, 1989, "Equipment, diverse from the Reactor Trip System (RTS), is required to initiate the Auxiliary Feedwater (AFW) System and a turbine trip for ATWS events," may not have been fully met for the 21 AFWP.

The apparent cause analysis is ongoing and determination of the apparent cause(s) and corrective actions for this matter has not been fully completed. This report will be supplemented upon complete determination of apparent causes and corrective actions.

ANALYSIS OF OCCURRENCE:

These events are reportable under 10 CFR 50.73(a)(2)(ii)(B) for an event or condition that that resulted in the plant being in a condition that was outside the design basis of the plant. A review of the events related to this report is ongoing. Consequently, the apparent cause(s) and corrective actions have not been completely determined.

Since ATWS is a low probability event without additional restrictions, and a loss of bus 3A only is also required to establish the conditions needed for this event, the failure scenario is very unlikely. Additionally, operator action to restore power to the bus and start 21 AFWP further mitigates the safety significance.

This event was discovered while the plant was in the hot shutdown mode. There was no release of radioactive materials, and sufficient safeguards equipment remained available to respond to design basis events. Therefore, the health and safety of the public were not adversely affected by this event.

The review of this event is ongoing and consequently determination of the apparent cause(s) and corrective actions and implementation of corrective actions for this matter have not been fully completed. This report will be supplemented when determination of apparent causes is completed and corrective actions are identified.

CAUSE OF OCCURRENCE:

A review of the events related to this report is currently ongoing. Consequently, apparent cause(s) and possible additional related corrective actions have not been determined.

CORRECTIVE ACTIONS:

Immediate Actions

The missing jumper wires for 21AFWP and 23AFWP were installed as required by design. The required control circuit modifications have been performed for the Motor Driven Auxiliary Feedwater Pumps

An extent of condition review on other circuits that may have similar anti-pump lockup problems or missing jumper wires was completed. This review evaluated 480 VAC blackout & Safety Injection (SI) sequenced loads, and other 480 VAC breaker circuits to identify any cases where normal control signals or missing jumper wires could cause an anti-pump breaker lockup. Although a similar anti-pumping lock-out of the Containment Spray Pump breakers can exist for approximately 2.5 seconds during the SI sequence, the condition self clears before the pump would receive its start signal, and therefore does not effect the pumps ability to start automatically as required.

A review of the Post Maintenance Testing (PMT) associated with the installation of AMSAC for 21AFWP to identify the missing jumper wire was initiated. In addition to this specific jumper wire, an evaluation of the adequacy of periodic testing for 21AFWP to demonstrate that all portions of 21AFWP control circuitry will perform their required safety functions has been initiated.

These reviews are ongoing and consequently determination of the apparent cause(s), and possible additional related corrective actions for this matter have not been completed. This report will be supplemented when determination of apparent causes is completed and additional related corrective actions are identified.