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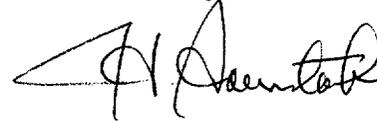
October 23, 2000

Re: Indian Point Unit No. 2
Docket No. 50-247
LER 2000-006-01
NL-00-127

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

The attached Licensee Event Report 2000-006-01 is hereby submitted in accordance with the requirements of 10 CFR 50.73.

Sincerely,



Attachment

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

Mr. Patrick D. Milano, Project Manager
Project Directorate I-1
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NRC FORM 366 (6-1998)	U.S. NUCLEAR REGULATORY COMMISSION	APPROVED BY OMB NO. 3150-0104	EXPIRES 06/30/2001
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 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.	

FACILITY NAME (1) Indian Point No. 2	DOCKET NUMBER (2) 05000-247	PAGE (3) 1 OF 5
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TITLE (4)
 Source Range Detector High Flux Trip Circuitry Outside of Plant Design Basis Due To Revised Local Cabinet Temperature Uncertainty

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
08	03	2000	2000	- 006	- 01	10	23	2000		05000
									FACILITY NAME	DOCKET NUMBER
										05000

OPERATING MODE (9)	000	THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more) (11)								
POWER LEVEL (10)	N	<input type="checkbox"/> 20.2201(b)	<input type="checkbox"/> 20.2203(a)(2)(v)	<input type="checkbox"/> 50.73(a)(2)(i)	<input type="checkbox"/> 50.73(a)(2)(viii)					
		<input type="checkbox"/> 20.2203(a)(1)	<input type="checkbox"/> 20.2203(a)(3)(i)	<input checked="" type="checkbox"/> 50.73(a)(2)(ii)	<input type="checkbox"/> 50.73(a)(2)(x)					
		<input type="checkbox"/> 20.2203(a)(2)(i)	<input type="checkbox"/> 20.2203(a)(3)(ii)	<input type="checkbox"/> 50.73(a)(2)(iii)	<input type="checkbox"/> 73.71					
		<input type="checkbox"/> 20.2203(a)(2)(ii)	<input type="checkbox"/> 20.2203(a)(4)	<input type="checkbox"/> 50.73(a)(2)(iv)	<input type="checkbox"/> OTHER					
		<input type="checkbox"/> 20.2203(a)(2)(iii)	<input type="checkbox"/> 50.36(c)(1)	<input type="checkbox"/> 50.73(a)(2)(v)	Specify in Abstract below or in NRC Form 366A					
<input type="checkbox"/> 20.2203(a)(2)(iv)	<input type="checkbox"/> 50.36(c)(2)	<input type="checkbox"/> 50.73(a)(2)(vii)								

LICENSEE CONTACT FOR THIS LER (12)

NAME	TELEPHONE NUMBER (Include Area Code)
Robert T. Allen, Manager Regulatory Affairs	914-734-5129

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
<input type="checkbox"/> YES <small>(If yes, complete EXPECTED SUBMISSION DATE).</small>	X	<input type="checkbox"/> NO						

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

On August 3, 2000, with the plant at cold shutdown, a determination was made that the source range portion of the Nuclear Instrumentation System (NIS) was outside of the plant design basis. It was determined that the temperature errors associated with the maximum control room design temperature limit of 120 degrees F had not been explicitly accounted for in establishing the current high flux trip set point of 5.0E5 counts per second (cps). The original set point supplied by Westinghouse was 1.0E5 cps. Data taken during Cycle 1 startup physics testing in 1973 showed the source range and intermediate range detector overlap curve to be slightly different than expected. To prevent unnecessary reactor trips on high source range indications, Westinghouse recommended changing the trip set point from 1.0E5 cps to 5.0E5 cps. However, the temperature errors associated with the maximum control room design temperature limit of 120 degrees F were not explicitly accounted for, based on information available and the set point methodologies used in 1973. LER 2000-006-00 stated that the set point was lowered to 2.3E5 cps to assure system operability during maximum expected operating temperatures in the control room. This is not the case. While the calculation for the new set point value has been approved, the set point change had not been implemented. The set point change will be implemented prior to the reactor trip breakers being closed. The reporting error is not considered significant, nor was the public health and safety affected, since the reactor trip breakers are open.

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

PLANT AND SYSTEM IDENTIFICATION

Westinghouse 4-Loop Pressurized Water Reactor
Nuclear Instrumentation System Source Range Detector Circuitry

EVENT IDENTIFICATION

Source Range Detector High Flux Trip Circuitry Outside of Plant Design Basis
Due to Revised Local Cabinet Temperature Uncertainty.

EVENT DATE

August 3, 2000

REFERENCES

Condition Reporting System Number: 200005734 and 200006762

Westinghouse letter LEE-1417, "Consolidated Edison Company Indian Point Unit 2
Precautions, Limitations & Setpoints Nuclear Source Range Reactor Trip,"
K.R. Ludwig (W) to C. Jackson (ConEd), dated 7/30/73.

PAST SIMILAR EVENTS

None.

EVENT DESCRIPTION

On August 3, 2000, with the plant at cold shutdown, a determination was made that the source range portion of the Nuclear Instrumentation System (NIS) was outside of the plant design basis. This event was identified during an internal review of the instrument loop uncertainty calculations for the source range detector channels. The review determined that the temperature errors associated with the maximum control room design temperature limit of 120 degrees F had not been explicitly accounted for in establishing the current high flux trip set point of 5.0E5 counts per second (cps). The original Nuclear Instrumentation System (NIS) source range detector high flux trip set point supplied by Westinghouse was 1.0E5 cps. Data taken during Cycle 1 startup physics testing in 1973 showed the source range and intermediate range detector overlap curve to be slightly different than expected. To prevent unnecessary reactor trips on high source range indications, Westinghouse recommended, in the referenced letter, to change the trip set point from 1.0E5 to 5.0E5 cps. This set point change also provided an entire decade (1.0E1 cps) of margin between the power level at which the source range detector trip can be bypassed (P-6 permissive) during power ascension and when the source range detector high flux trip occurs. However, the temperature errors associated with the maximum control room design temperature limit of 120 degree F were not explicitly accounted for based on information available and the set point methodologies used in 1973.

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The existing set point of 5.0E5 cps corresponds to 95 percent of the signal span (0 to 10 Vdc for 1E0 to 1E6 cps or 1.667 Vdc/decade) for the source range level amplifiers. Establishing set points at the high end of an instrument's signal span is generally not considered a good practice due to the potential for the instrument uncertainties precluding a bistable from changing state at the appropriate value. For the existing set point of 5.0E5 cps, the instrument loop uncertainties are higher than those for 1.0E5 cps at higher control room temperatures due to the logarithmic nature of the channel. As such, with the existing set point of 5.0E5 cps, saturation of the source range detector level amplifiers could occur at high control room temperatures precluding a reactor trip when required to terminate a power excursion.

LER 2000-006-00 stated that the set point was lowered to 2.3E5 cps. This is not the case. While the calculation for the new set point value has been approved, the set point change had not been implemented. The set point change will be implemented prior to the reactor trip breakers being closed. Since the reactor trip breakers are open, the reporting error is not considered significant, and the public health and safety is not affected.

EVENT ANALYSIS

The cause of the plant being outside the design basis was that the temperature errors associated with the maximum control room design temperature of 120 degrees F were not explicitly accounted for when the set point was changed from 1.0E5 cps to 5.0E5 cps in 1973. The change in the set point was based on the information available at the time and the set point methodologies used in 1973, which did not evaluate temperature effects. The instrument loop errors associated with the Reactor Protection System (RPS) and the Engineered Safety Features Actuation System (ESFAS) set points were analyzed and determined for operating conditions. The only set point identified to be effected by the control room temperature limit was the NIS source range set point.

This event is reportable in accordance with 10CFR50.73(a)(2)(ii)(B), which requires a report of, "Any event or condition ... that resulted in the nuclear power plant being: ... In a condition that was outside the design basis of the plant."

The cause of the reporting error in LER 2000-006-00 was due to a cognitive mistake. LER 2000-006-00 contained the following statements:

"For additional conservatism, the nominal trip set point was lowered to 2.3E5 cps..." and "...the nominal source range detector high flux trip set point was set at 2.35E5 cps."

Validation of the above statements was performed by reviewing the approved set point calculation for the value of 2.35E5 cps. The reviewer accepted this as validation that the set point change had been completed when in fact, the set point change had yet to be implemented.

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EVENT SAFETY SIGNIFICANCE

There were no operational or safety consequences, or implications attributed to the failure to properly account for the instrument loop uncertainty associated with the maximum control room design temperature of 120 degrees F in establishing the current source range detector high flux trip set point of 5.0E5 cps because:

- (1) The Indian Point 2 Technical Specifications do not include any reactor trip set point limits for the NIS source range detector channels.
- (2) The source range high flux trip is not credited in any of the Updated Final Safety Analysis Report (UFSAR) Chapter 14 accident analyses.
- (3) If the maximum control room design temperature limit of 120 degrees F were approached and the source range detector level amplifiers were to saturate, thereby preventing a source range high flux trip, then the Intermediate Range High Flux Trip (25 percent) and Power Range High Flux Trip (Low Set Point, 25 percent) would be available to provide redundant protection for termination of a power excursion during a reactor start-up or low power operation condition.

The reactor trip breakers were open prior to the issuance of LER 2000-006-00 (September 5, 2000), and the breakers have remained open. In addition, the set point change will be implemented prior to the reactor trip breakers being closed. Therefore, since the trip set point causes the reactor trip breakers to open there were no operational or safety consequences, or implications attributed to the reporting error in LER 2000-006-00.

Based on the above, it can be concluded that the public's health and safety was assured at all times.

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CORRECTIVE ACTIONS

A statistical instrument loop uncertainty re-analysis was performed by Westinghouse for the source range detector channels. This analysis determined that an upper limit of 3.0E5 cps is required to prevent saturation of the source range level amplifiers when the maximum control room design basis temperature limit of 120 degrees F is applied. For additional conservatism, the nominal source range detector high flux trip set point will be set at 2.3E5 cps.

The new set point of 2.3E5 cps was established considering the impact of instrument inaccuracies on the high end of the instrument range and the impact of channel noise on the low end of the range. The planned reduction of the set point from 5.0E5 to 2.3E5 cps will result in:

- a. A reduction in the instrument loop errors.
- b. A more conservative value which assures that a reactor trip will occur earlier in time while, at the same time, minimizing the occurrences of spurious, noise related trips.
- c. A set point that is located at approximately 89.4 percent of the source range detector signal range.
- d. Providing system operability during maximum expected operating temperature in the control room.
- e. A slight reduction (i.e., approx. 13 percent) in the margin between the power level at which the source range detector trip can be bypassed (P-6 permissive) during power ascension and when the source range detector high flux trip occurs. This reduction should not however, pose an operational concern related to spurious trips.

With respect to the reporting error in LER 2000-006-00:

- a. Validation reviewers have been made aware of this type of error.
- b. The procedure that governs submittals to the NRC will be revised by November 10, 2000, to emphasize validation of appropriate implementing documents.
- c. The set point change will be implemented prior to the reactor trip breakers being closed.