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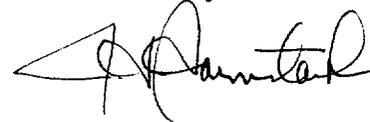
May 4, 2000

Re: Indian Point Unit No. 2
Docket No. 50-247
LER 2000-004-00

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

The attached Licensee Event Report 2000-004-00 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. 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

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PO Box 38
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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 4
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TITLE (4)
Design Basis Compliance Failure Due to Spent Fuel Storage Rack Boraflex Degradation

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
04	06	2000	2000	- 004 -	00	05	04	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 Robert T. Allen, Manager Regulatory Affairs	TELEPHONE NUMBER (Include Area Code) 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
B	DB	RK	B386	N					

SUPPLEMENTAL REPORT EXPECTED (14)				EXPECTED SUBMISSION DATE (15)		
<input type="checkbox"/> YES (If yes, complete EXPECTED SUBMISSION DATE).	<input checked="" type="checkbox"/> NO			MONTH	DAY	YEAR

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

On April 6, 2000, Northeast Technology Corp (NETCO) presented the preliminary results of the BADGER (Boron-10 Areal Density Gauge for Evaluating Racks) testing of the Unit 2 spent fuel racks. The preliminary results showed that besides thinning, some Boraflex panels have developed gaps. The maximum size of the gaps is 7 inches. Since the rack design is supposed to provide unrestrained shrinkage of Boraflex to preclude any mechanism that might cause gaps to form, no gap formation was assumed in the current criticality analysis. Therefore, the assumptions used in the current criticality analysis are no longer met.

Interim corrective actions included "checkerboarding" the fuel assemblies in the spent fuel pool. Analysis performed by NETCO demonstrates that with this fuel "checkerboard" pattern, the spent fuel pool Keff can be conservatively maintained below 0.95 without taking credit for the soluble boron in the spent fuel pool water. The cause of the Boraflex degradation is high cumulative gamma radiation exposure and long term exposure to the spent fuel pool water.

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		2000	- 0 0 4 -	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
Spent Fuel Storage Racks

EVENT IDENTIFICATION

Design Basis Compliance Failure Due to Spent Fuel Storage Rack
Boraflex Degradation

EVENT DATE

April 6, 2000

REFERENCES

Condition Reporting System Number: 200002451

PAST SIMILAR EVENTS

None.

EVENT DESCRIPTION

On April 6, 2000, the plant was at cold shutdown, Northeast Technology Corp (NETCO) presented the preliminary results of the BADGER (Boron-10 Areal Density Gauge for Evaluating Racks) testing of the Indian Point 2 spent fuel racks.

A summary of the preliminary results follows:

- (1) Maximum boron carbide loss in Region 1 Boraflex panels is 18 percent.
- (2) Maximum gap size in Region 1 Boraflex panels is 4 inches.
- (3) Maximum boron carbide loss in Region 2 Boraflex panels is 22 percent.
- (4) Maximum gap size in Region 2 Boraflex panels is 7 inches.

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Since the rack design is supposed to provide unrestrained shrinkage of Boraflex to preclude any mechanism that might cause gaps to form, no gap formation was assumed in the current criticality analysis. Therefore, the assumptions used in the current criticality analysis are no longer met.

Analysis performed by Northeast Technology Corp (NETCO) demonstrates that by implementing a "checkerboard" fuel distribution pattern in the spent fuel racks, a spent fuel pool Keff of less than 0.95 can be conservatively maintained without taking credit for the soluble boron in the spent fuel pool water.

This event was self-identified by Indian Point 2 personnel after review of the preliminary data from the BADGER testing, as provided by NETCO.

The Boraflex panels in the spent fuel pool were manufactured by Brand Industrial Services Corporation (BISCO), and have been in the spent fuel pool since 1990.

EVENT ANALYSIS

The cause of the plant being outside the design basis was the Boraflex degradation identified by the BADGER testing indicating that the spent fuel racks would not have been able to accept core off-loads for the life of the plant's license, which currently expires in 2013.

The intermediate cause of the Boraflex degradation was dissolution of the boron from the Boraflex matrix. Boraflex, a neutron absorber material, consists of about 50 weight percent boron carbide, and about 50 weight percent polymer matrix that contains the boron carbide. In the spent fuel storage pool, the Boraflex is exposed to the aqueous pool environment and, in addition, when the racks contain spent fuel assemblies, the Boraflex is exposed to high gamma radiation. Under these service conditions, the physical and chemical properties of Boraflex change, including shrinkage, gap formation, and Boraflex dissolution.

This event is reportable in accordance with 10CFR50.73(a)(2)(ii), 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."

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

EVENT SAFETY SIGNIFICANCE

There were no operational or safety consequences or implications attributed to the Boraflex degradation because:

- (1) Analysis performed by NETCO demonstrates that by implementing a "checkerboard" fuel distribution pattern in the spent fuel racks, a spent fuel pool Keff of less than 0.95 can be conservatively maintained without taking credit for the soluble boron in the spent fuel pool water, and
- (2) Indian Point 2 Technical Specification 3.8.D.2 states that the soluble boron concentration in the spent fuel pool will be at least 1,500 ppm at all times. Analysis has shown that 1500 ppm soluble boron will compensate for a complete degradation (100% boron carbide loss) of the Boraflex panels. Indian Point 2 maintains administrative controls to assure adherence to this specification.

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

CORRECTIVE ACTIONS

Spent fuel assemblies were removed from selected storage rack cells to implement a "checkerboard" fuel distribution pattern, so that the resulting fuel distribution pattern is bounded by the criticality analysis performed by NETCO.

Long-term corrective actions include the following:

- (1) Prior to placing fuel assemblies in the spent fuel racks, independent verification has been established to assure the configuration is bounded by the criticality analysis.
- (2) Licensee actions, to obtain credit for soluble boron in the spent fuel pool, will be pursued in accordance with the NRC-accepted methodology.
- (3) Licensee actions, to obtain credit for neutron absorber material (control rods, absorber rodlets, and/or absorber panels), will be evaluated.