Indian Point 3
Nuclear Power Plant
P.O. Box 215
Buchanan, New York 10511
914 739.8200

New York Power Authority

November 9, 1990
IP3-90-067

Docket No. 50-286
License No. DPR-64

Document Control Desk
Mail Station PI-137
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

Dear Sir:

The attached Licensee Event Report LER 90-008-00 is hereby submitted in accordance with the requirements of 10CFR50.73. This event is of the type defined in the requirements per 10CFR50.73(a)(2)(v).

Very truly yours,

Joseph Russell
Resident Manager
Indian Point Three Nuclear Power Plant

RB/rj
Attachment

cc: Mr. Thomas T. Martin
Regional Administrator
Region 1
U.S. Nuclear Regulatory Commission
475 Allendale Road
King of Prussia, Pennsylvania 19406

INPO Records Center
Suite 1500
1100 Circle 75 Parkway
Atlanta, Georgia 30339

IE22
'11

NRC Form 366
(9-83)

U.S. NUCLEAR REGULATORY COMMISSION
APPROVED OMB NO. 3150-0104
EXPIRES: 8/31/88

LICENSEE EVENT REPORT (LER)

FACILITY NAME (1)	DOCKET NUMBER (2)	PAGE (3)
Indian Point Unit 3	0 5 0 0 0 2 8 6	1 OF 0 7

TITLE (4) Two Fuel Assemblies Stuck to Upper Internals Package When Raised From Reactor Vessel During Planned Refueling

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 0	0 4	9 0	9 0	— 0 0 8	— 0 0	1 1	0 9	9 0		0 5 0 0 0
										0 5 0 0 0

OPERATING MODE (9)		THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more of the following) (11)			
N		20.402(b)	20.405(c)	50.73(a)(2)(iv)	73.71(b)
POWER LEVEL (10)		20.405(a)(1)(i)	50.36(c)(1)	X 50.73(a)(2)(v)	73.71(c)
0 0 0		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	TELEPHONE NUMBER
Richard Bystrak	AREA CODE 9 1 4 — 7 3 6 8 0 4 3

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	
A	A C	R C T	W 3 5 1	Yes							

SUPPLEMENTAL REPORT EXPECTED (14)		EXPECTED SUBMISSION DATE (15)	MONTH	DAY	YEAR
YES (If yes, complete EXPECTED SUBMISSION DATE)	NO				

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

ABSTRACT

During the 7/8 refueling outage at Indian Point, two peripheral fuel assemblies were inadvertently withdrawn from the core during the removal of the upper internals. These assemblies were connected to the upper core plate by misaligned guide pins. Control room operators notified the NRC as required by 10CFR50.72.b.2.iii.c. The plant staff developed a retrieval plan that included remote video monitoring, and the use of recovery baskets. During the retrieval process, one fuel assembly dislodged and dropped into its intended retrieval basket with no structural damage or release of radioactivity. The second assembly was successfully retrieved after being dislodged with a hydraulic wedge. Both assemblies were transferred to the spent fuel pool. The root cause analysis team has determined that the guide pins were damaged while moving the upper internals from its stand to the reactor during the cycle 6/7 refueling outage.

FACILITY NAME (1)	DOCKET NUMBER (2)	LER NUMBER (6)			PAGE (3)
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	
Indian Point, Unit 3	0 5 0 0 0 2 8 6	9 0	— 0 0 8	— 0 0	0 2 OF 0 7

TEXT *(If more space is required, use additional NRC Form 366A's)* (17)

DESCRIPTION OF THE EVENT

Indian Point Three shut down on September 15, 1990, for a scheduled refueling outage. On October 4, 1990, the plant was in the refueling condition with the reactor head removed.

Using refueling procedure SOP-RP-1, the refueling team lifted the upper internals until it was clear of the reactor flange by approximately one foot. They then surveyed the upper core plate using a submersible video camera, as required by procedure, to determine that the upper internals were clear of the reactor and that no fuel assemblies were attached. No fuel assemblies were detected which has now been attributed to poor water clarity immediately following the lift. The upper internals were lifted several feet higher and lateral movement of the internals toward the lower reactor cavity was commenced. Refueling team members, through visual and remote video monitoring indications, noticed a shadow below the upper core plate and immediately stopped the crane. Inspection revealed two fuel assemblies hanging from the upper internals.

The control room was notified and the containment building was evacuated of all personnel. Control room operators notified the NRC within one hour as required by 10CFR50.72.b.2.iii.c.

INVESTIGATION OF THE EVENT

Indian Point Three shut down on September 15, 1990, for a scheduled refueling outage. Normal maintenance activities for the cycle 7/8 refueling outage included eddy current inspection of steam generator (SG) tubes. A foreign object, approximately 3 inches long, with a tapered end, was found lodged in a hot leg tube of steam generator 34. Plant staff postulated that the object could be a guide pin from the upper internals. During refueling, an In Service Inspection team planned to inspect the upper internals for missing guide pins. The inspection plan called for the upper internals to be raised from the reactor vessel and moved to the lower reactor cavity area to facilitate the use of a submersible video camera for inspection of the upper core plate guide pins.

Prior industry experience had prompted the Power Authority to make procedure changes that would check for lodged fuel assemblies. These changes and the possibility of such an event were discussed during a pre-job briefing. The refueling team then lifted the upper internals until it was clear of the reactor flange by approximately one foot. They observed the upper internals and surveyed the upper core plate with the submersible video camera. Failing to observe the two hanging fuel assemblies, which has now been attributed to poor water clarity, the refueling team agreed that lateral movement of the upper internals could be performed. The upper internals were lifted several feet higher and lateral movement commenced. Plant engineers, monitoring remote video indication, noticed, at this point, a shadow below the upper core plate. Simultaneously, a Health Physics technician noticed objects hanging from the upper internals package and alarmed the crane operator who immediately stopped the crane. Additional inspection revealed two fuel assemblies hanging from the upper internals.

Refueling team members notified the control room and evacuated the containment building of all personnel. Control room operators notified the NRC within one hour as required by 10CFR50.72.b.2.iii.c. The plant remained in the residual heat removal cooling mode with the reactor cavity filled to the 93 foot elevation. Site management halted all work in the containment building and any electrical or safety related equipment work outside the containment building. These restrictions minimized any disturbance to the polar crane, core cooling, radiation monitoring equipment, and containment isolation mechanisms.

On October 5, 1990, the NRC issued a confirmatory action letter requiring the New York Power Authority to:

"1. Develop a plan for the safe, controlled retrieval of the two fuel assemblies attached to the upper core internals and discuss this plan with NRC Region I prior to its implementation.

2. Obtain NRC agreement prior to taking any action which would move the upper core internals with the two fuel assemblies.

3. Obtain NRC agreement prior to taking any action likely to degrade containment integrity and containment isolation.

4. Obtain NRC agreement prior to taking any action likely to degrade the operability and functional condition of systems for emergency core cooling, electrical distribution, backup electrical supplies, and containment radiation monitoring.

5. Restrict containment access to personnel required for necessary monitoring of the fuel and safety equipment and for subsequent fuel recovery efforts."

Plant staff developed a retrieval plan that included remote video monitoring, the use of retrieval baskets, taglines for rotating the upper internals, the use of a hydraulic wedge for dislodgement, and the performance of mock-up tests with the retrieval equipment. Plant engineers developed a nuclear safety evaluation which supported these decisions. To maintain containment integrity, all retrieval equipment was designed to allow transfer into the containment building through the personnel air locks.

Video mapping of the upper core plate identified that the lodged fuel assemblies were at core periphery locations B-13 (assembly T-64) and A-5 (assembly U-21). Neither assembly contained a control rod. Several dry runs with mock-ups of both the pin/nozzle interface and the upper internals assisted in design development of the retrieval equipment and manipulator crane modifications. The retrieval team received formal training on retrieval procedures, contingency plans and use of specialized equipment.

The Power Authority reached agreement with the NRC for all retrieval plan elements on October 16, 1990 and proceeded with the recovery. The upper internals were lifted until clearance of the fuel assembly over the rector vessel flange was obtained. This

resulted in radiation levels of 3 rem/hr on contact with the upper internals and 450 mrem/hr at the cavity edge. Retrieval team members rotated the upper internals 180 degrees to reposition hanging fuel assemblies away from the core and toward the lower cavity. Procedures specified that the upper internals would be moved east to the lower internal cavity and then north approximately 8 inches to position the fuel assemblies over their respective basket centers. At the completion of the first movement, one fuel assembly (B-13) dislodged from the upper internals and fell into its intended recovery basket. As required by procedure, all members of the retrieval team immediately evacuated the containment building. Health physics personnel obtained radiation monitor readings and air sample measurements to assess if fuel assembly damage had occurred. They concluded that no damage had occurred.

The remaining fuel assembly was positioned over the center of its intended recovery basket and partially lowered.

On October 17, 1990, the fuel assembly was lowered to within 6 inches of the bottom of the recovery basket. The retrieval team proceeded to employ a hydraulic wedge to dislodge the fuel assembly from the upper core guide pins. The upper internals were then placed in the normal support stand on the west side of the reactor cavity. Since the fuel assembly nozzle blocks were damaged such that a normal transfer to the spent fuel pool could not be accomplished, another method had to be developed. It was decided to use 'J' hooks to grapple the holddown springs of the damaged nozzles. The retrieval team successfully lifted the damaged fuel assemblies in this manner and transferred them to the spent fuel pool and placed them in modified storage rack locations designed to facilitate handling.

The total radiological exposure estimate for all phases of the retrieval operation was 15.4 man-rem.

CAUSE OF THE EVENT

The affected assemblies were lodged between misaligned upper core plate guide pins causing the event. The root cause team has determined, through their review of this event, tapes of previous refueling activities (cycle 6/7), visual inspections, and other engineering analyses that the guide pins were damaged while moving the upper internals from its stand to the reactor during the last refueling outage. This damage occurred because the upper internals package had not been lifted sufficiently and struck the stand during lateral movement.

CORRECTIVE ACTIONS

The following immediate corrective actions have been taken:

1. The top of the core was inspected to determine if any other assemblies incurred damage from the upper internals.

2. The upper core plate guide pins were inspected for center to center alignment, eccentricity, and damage.

3. The damaged assemblies were transferred to the spent fuel pool and placed in modified storage rack locations.

4. The remainder of the core was off loaded and a thorough inspection of the lower internals and the reactor vessel was conducted.

5. All fuel assemblies were extensively examined.

6. All damaged upper core plate guide pins have been straightened or removed.

7. Refueling procedure SOP-RP-1 will be revised to include additional detail, precautions and limitations governing upper internal movement.

ANALYSIS OF THE EVENT

This event is reportable under 10CFR50.73.a.2.v.c., an event that could have prevented the fulfillment of the safety function of structures needed to control the release of radioactive exposures or any abnormal release of radioactive material to the containment atmosphere or refueling water. The event posed no threat to public health and safety because containment integrity existed at all times when the fuel assemblies were suspended or were being handled. Plant staff isolated containment ventilation during all retrieval operations.

A nuclear safety evaluation was prepared for all procedures, equipment, and methods used. Plant staff concluded that the fuel assembly recovery plan did not constitute an unreviewed safety question. Had both of the suspended fuel assemblies dropped and every fuel pin ruptured, the accident would be bounded by the Indian Point Three Final Safety Analysis Report (FSAR) for a fuel handling accident. The nuclear safety evaluation estimated the potential release from damage to two dropped assemblies to be a small fraction of the analyzed accident values.

SECURING FROM THE EVENT

On October 19, 1990, the event was secured when the two fuel assemblies were transferred to the spent fuel pool. Inspection and repair of the upper internals has been performed and refueling is currently being performed.