

Indian Point 3  
Nuclear Power Plant  
P.O. Box 215  
Buchanan, New York 10511  
914 736.8001



**New York Power  
Authority**

L. M. Hill  
Resident Manager

July 9, 1994  
IPN-94-084

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

SUBJECT: Indian Point 3 Nuclear Power Plant  
Docket No. 50-286  
Licensee Event Report # 93-009-01  
"Incorrect Operability Criteria for the RWST  
Due to Not Combining Loop Inaccuracies"

Dear Sir:

The attached Licensee Event Report (LER) 93-009-01 is hereby submitted in accordance with the requirements of 10CFR50.73. This event is of the type defined in the requirements pursuant to 10CFR50.73(a)(2)(i)(B). This supplement provides information on the extent of the out of specification condition, the cause of the event and editorial changes. The Authority is making no commitments in this supplement.

Very truly yours,

A handwritten signature in cursive script, appearing to read 'L. M. Hill'.

L. M. Hill  
Resident Manager  
Indian Point 3 Nuclear Power Plant

LMH/vjm

cc: See next page

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9407140167 940709  
PDR ADDCK 05000286  
S PDR

*Handwritten initials/signature*

cc: Mr. Thomas T. Martin  
Regional Administrator  
Region I  
U.S. Nuclear Regulatory Commission  
475 Allendale Road  
King of Prussia, Pennsylvania 19406-1415

U.S. Nuclear Regulatory Commission  
Resident Inspector's Office  
Indian Point 3 Nuclear Power Plant

INPO Records Center  
700 Galleria Parkway  
Atlanta, Georgia 30339-5957

**LICENSEE EVENT REPORT (LER)**

(See reverse for required number of digits/characters for each block)

ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS INFORMATION COLLECTION REQUEST: 50.0 HRS. FORWARD COMMENTS REGARDING BURDEN ESTIMATE TO THE INFORMATION AND RECORDS MANAGEMENT BRANCH (MNB 7714), 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.

FACILITY NAME (1) Indian Point Unit 3	DOCKET NUMBER (2) 05000286	PAGE (3) 1 OF 6
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TITLE (4)  
Incorrect Operability Criteria for the RWST Due to Not Combining Loop Inaccuracies

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
4	23	90	93	-- 009 --	01	7	9	94		05000
									FACILITY NAME	DOCKET NUMBER
										05000

OPERATING MODE (9) N	POWER LEVEL (10) 100	THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more) (11)								
		20.402(b)	20.405(c)	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					
		20.405(a)(1)(iii)	<input checked="" type="checkbox"/>	50.73(a)(2)(i)	50.73(a)(2)(viii)(A)					(Specify in Abstract below and in Text, NRC Form 366A)
		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 F. Froebrich, System Engineer	TELEPHONE NUMBER (Include Area Code) (914) 736-8320
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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

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 15 single-spaced typewritten lines) (16)

On January 28, 1993 a QA audit identified a non-compliance associated with surveillance test operability criteria for the refueling water storage tank lo-lo level alarms. Combined inaccuracies of the transmitter and bistables were not factored into the surveillance test operability criteria. A review of 21 surveillance tests conducted over 204 months identified five tests not satisfying "as-found" operability criteria and four tests not satisfying "as-left" operability criteria. The causes of the event were an original design that did not calculate inaccuracies and the engineers that developed the operability criteria of the original surveillance tests in 1975 did not combine inaccuracies of a transmitter and bistables in an alarm circuit. Accuracy calculations identified the five "as-found" and four "as-left" conditions. A contributing cause was an incorrect revision to the operability criteria in 1989 due to a personnel error. The criteria did not ensure operability of the required number of alarms circuits. Corrective actions include evaluating the adequacy of the instruments to provide for the specification, revising the surveillance test operability criteria, and reviewing similar surveillance tests for instrument inaccuracy concerns and multiple mode changes.

**LICENSEE EVENT REPORT (LER)**  
**TEXT CONTINUATION**

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

DESCRIPTION OF THE EVENT

On January 28, 1993, with the plant at full power, the Quality Assurance (QA) Department conducted an audit of the surveillance testing program and identified a non-compliance associated with the operability criteria for the refueling water storage tank (RWST) (TK) (BP) lo-lo level alarms.

The Indian Point 3 (IP3) technical specification section 3.3.A.3.k requires two RWST lo-lo level alarms to be operable and set to alarm between 98,100 gallons and 100,850 gallons of water in the tank prior to exceeding 350 degrees Fahrenheit in the reactor coolant system. One RWST lo-lo level alarm is required to be operable prior to exceeding 200 degrees Fahrenheit in the reactor coolant system.

The two redundant RWST lo-lo level alarms signal operators to transition from the injection to the recirculation phase of safety injection. The alarms annunciate in the IP3 control room.

Two independent circuits provide for the RWST alarms. One circuit includes a level transmitter and two bistables aligned in parallel, which actuate a single alarm. The other circuit is a level indicating switch which actuates a second alarm.

The transmitter is LT-920 (LT) (BP) (Foxboro model E11GM) (F180). The two bistables are LC-920A and LC-920B (LC) (BP) (Foxboro model M/63U-BC-OHCA-F) (F180). The level indicating switch is LIC-921 (LIC) (BP) (Barton) (288A). Procedure 3PT-SA33, "Refueling Water Storage Tank Lo-Lo Level Instrumentation System Check and Calibration", tests the performance of these circuits.

The QA audit identified the combined inaccuracies of the transmitter and bistables were not factored into the surveillance test operability criteria. On August 30, 1989, the operability criteria was revised incorrectly to require one of three instruments (920A, 920B, or 921) be within tolerance rather than requiring that the two alarm channels be operable. The test performers properly performed the tests as written.

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

The Technical Services Department reviewed the surveillance data dating back to April 23, 1975. Considering inaccuracies, they concluded that five "as-found" and four "as-left" data sets did not satisfy the required operability criteria. The "as-left" condition resulted in an alarm being outside the operability criteria for the periods: October 8, 1979 through October 7, 1980; March 16, 1983 through December 6, 1983; and, February 1, 1990 through July 10, 1990.

INVESTIGATION OF THE EVENT

The original operability criteria for the RWST lo-lo level alarm test was developed in 1975. Technical Services determined that the reason for not combining inaccuracies due to the transmitters and bistables was the original design philosophy. The original design adopted a tolerance of 0.5 percent of span for both transmitters and bistables based on a conclusion that the accuracies of individual modules need not be root mean squared or otherwise operated on mathematically to obtain channel accuracy. The basis for the technical specifications states the specified quantities of water for the RWST include inaccuracies (1406 gallons) in the alarm setpoint.

On August 30, 1989 calibration procedure 3PC-R10, "Refueling Water Storage Tank Level Calibration", was replaced by surveillance test 3PT-Q67. While developing the operability criteria for 3PT-Q67, the technician referenced the wrong section of technical specifications. The technician used the 200 degrees Fahrenheit, rather than the 350 degrees Fahrenheit specification. The review process or subsequent revisions did not identify the error.

Indian Point 3 has had three previous similar Licensee Event Reports (LERs). These LERs were the result of the RWST lo-lo level alarms not satisfying the "as-found" operability criteria as follows:

LER	DATE	INSTRUMENT AS FOUND		
		LT-920	LC-920A	LIC-921
78-018	8/18/78		Low	
87-007	6/5/87	High		High
89-005	4/7/89	Low		High

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Corrective actions were to recalibrate the instruments and increase the frequency for calibration. The frequency was increased from a refueling frequency to quarterly in 1989. After five consecutive successful tests, the frequency was changed to semi-annual. The corrective actions did not include performing a loop calculation. The calculation would have considered the combined effects of transmitter and bistable inaccuracies.

CAUSE OF THE EVENT

The cause of not combining inaccuracies of transmitter and bistables was the original design practice of using a tolerance of 0.5 percent of span for both transmitters and bistables rather than taking the root mean squared or otherwise operating on mathematically with the accuracies of individual modules to obtain channel accuracy.

The cause of incorrect operability criteria for the number of instruments within tolerance was a personnel error by a technician due to inattention to detail. The technician incorrectly entered a 200 degrees Fahrenheit technical specification requirement as the operability criteria in the surveillance test. The correct criteria was the 350 degrees Fahrenheit specification.

A contributing cause was inadequate review of the procedure. The review process did not identify the error.

CORRECTIVE ACTIONS

Corrective actions to prevent recurrence of the event follow:

1. The current "RWST Lo-Lo Level Instrumentation System Check and Calibration", Procedure 3PT-Q83, has been revised to include the correct operability requirement. This commitment is complete.
2. The surveillance frequency for this test has been changed from semi-annual to quarterly. This commitment is complete.
3. A technical review of similar surveillance procedures for instrument inaccuracy concerns has been completed. This commitment is complete.

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4. A complete review of surveillance tests of the RWST lo-lo level alarms dating back to 1975 has been accomplished and reported in LER 93-009-01. This commitment is complete.
5. The individual that inadvertently entered the incorrect operability criteria in 1989 no longer works for the Authority. This commitment is complete.
6. Technical Specifications have been reviewed to identify components or instruments that have multiple mode change requirements. A review of the surveillance test operability criteria associated with these components has been conducted prior to implementing the test. This commitment is complete.
7. The investigation to determine the reason for not combining the bistable and transmitter inaccuracies in the original operability criteria was completed and is reflected in the discussion of cause. This commitment is complete.

ANALYSIS OF THE EVENT

This event is reportable under section 10CFR50.73(a)(2)(i)(B) of the regulations wherein any operation or condition prohibited by the plant's technical specifications shall be reported. Technical specification 3.3.A.3.k. requires that both RWST lo-lo level alarms be operable before the reactor coolant system Tavg exceeds 350 degrees F.

Technical Services has reviewed the completed RWST lo-lo level alarm surveillance tests from December 13, 1975 through December 22, 1992 and identified that five "as-found" and four "as-left" data sets did not satisfy the technical specification operability criteria. The "as-left" data reflects that the instrument did not meet the technical specification requirements. This was due to not combining the inaccuracies of transmitters and bistables in the alarm circuits. The "as-left" condition resulted in an alarm being outside the operability criteria for the periods: October 8, 1979 through October 7, 1980; March 16, 1983 through December 6, 1983; and, February 1, 1990 through July 10, 1990.

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SAFETY SIGNIFICANCE

This event did not affect the health and safety of the public.

The inoperable level alarms during the design basis accident would not have affected the Final Safety Analysis Report results.

The purpose of this alarm is to alert the reactor operator to begin transferring the safety injection (SI) system from the injection mode to the recirculation mode. This transfer is a manual operator action that is controlled by the emergency operating procedures EOPs. The nine cases that were outside the correct acceptance criteria would have alarmed early.

This potentially could result in the transfer starting before the last approximately 16,000 gallons of RWST (246,000 gallons required) water entered the containment. However, the EOPs ensure that an adequate amount of water has entered the containment by means of alternate indication, specifically the containment building water level. The EOPs require verification of the containment building water level.

PREVIOUS EVENTS

LER 78-018; LER 87-007; LER 89-005

The corrective actions from these LERs did not address performing a loop calculation which would have prevented this event.

SECURING FROM THE EVENT

An amendment to the Technical Specification has been submitted to the NRC (IPN-93-144) in part to change the minimum required volume and lo-lo level alarm settings of the Refueling Water Storage Tank (RWST). With the changed settings, a standard approach to instrument inaccuracies (specified by ANSI/ISAS S67.04-1988 can be applied to the associated instruments. The two RWST lo-lo level alarms will be verified operable prior to exceeding 350 degrees Fahrenheit in the reactor coolant system.