James A. FitzPatrick
Nuclear Power Plant
P.O. Box 41
Lycoming, New York 13093
315 342-3840

New York Power Authority

Harry P. Salmon, Jr.
Resident Manager

July 24, 1992
JAFP-92-0557

United States Nuclear Regulatory Commission
Document Control Desk
Mail Station P1-137
Washington, D.C. 20555

SUBJECT: DOCKET NO. 50-333
LICENSEE EVENT REPORT: 92-036-00 - Inadequate RCIC Vacuum Breaker Line Protection against HELB

Dear Sir:

This report is submitted in accordance with 10 CFR 50.73(a)(2)(ii)(B).

Questions concerning this report may be addressed to Mr. W. Verne Childs at (315) 349-6071.

Very truly yours,

HARRY P. SALMON, JR.

HPS:WVC:tmk

Enclosure

cc: USNRC, Region I
USNRC Resident Inspector
INPO Records Center

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Cert # P 629 542 714

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NRC FORM 366 (6-89) U.S. NUCLEAR REGULATORY COMMISSION

APPROVED OMB NO. 3150-0104
EXPIRES 4/30/92
ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS INFORMATION COLLECTION REQUEST: 50.0 HRS. FORWARD COMMENTS REGARDING BURDEN ESTIMATE TO THE RECORDS AND REPORTS MANAGEMENT BRANCH (P-530), U.S. NUCLEAR REGULATORY COMMISSION, WASHINGTON, DC 20555, AND TO THE PAPERWORK REDUCTION PROJECT (3150-0104), OFFICE OF MANAGEMENT AND BUDGET, WASHINGTON, DC 20503.

LICENSEE EVENT REPORT (LER)

FACILITY NAME (1): James A. FitzPatrick Nuclear Power Plant

DOCKET NUMBER (2): 0 5 0 0 0 3 3 3

PAGE (3): 1 OF 0 4

TITLE (4): RCIC Vacuum Breaker Line inadequately protected against HELB effects due to change in design criteria

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)
0 6	2 6	9 2	9 2	0 3 6	0 0	0 7	2 4	9 2		0 5 0 0 0
										0 5 0 0 0

OPERATING MODE (9)	N	THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more of the following) (11)			
POWER LEVEL (10)	0 0 0	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 (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)	X 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
	AREA CODE
W. Verne Childs, Senior Licensing Engineer	3 1 5 3 4 9 - 6 0 7 1

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 fifteen single-space typewritten lines) (16)

EIIS Codes are in []

The plant was shutdown and in the cold condition for maintenance and refuel. On 6/26/92, as a result of analyses being performed to qualify HPCI [BJ] and RCIC [BN] vacuum breaker lines as an extension of primary containment in response to questions on containment isolation arising from the Diagnostic Evaluation Team (DET) inspection, it was determined that before the RCIC vacuum breaker line can be considered part of the containment, a pipe whip restraint is required to be added to the RCIC steam supply line to protect the nearby RCIC vacuum breaker line from damage in the event of a High Energy Line Break (HELB). Because the FSAR stated that the primary containment was protected against high energy line breaks, this deficiency is being considered a condition outside the licensing basis for the plant. The original design analysis limited itself to the impact of HELB/vacuum breaker line break on the torus and did not evaluate vacuum breaker lines independently for protection against HELB as is done by the current analysis. A pipe whip restraint will be installed on the RCIC steam line prior to startup from the current outage.

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Description

On 6/26/92, with the unit shutdown and in a cold condition for maintenance and refueling, it was determined that before the RCIC vacuum breaker line can be considered an extension of the primary containment, a pipe whip restraint is required to be installed on the RCIC [BN] steam supply line to prevent impact to the RCIC vacuum breaker line in the event of a high energy line break (HELB). The lack of the pipe whip restraint is considered to be a condition outside the plant licensing basis as described in the FSAR. This deficiency was identified during an engineering analysis to qualify the HPCI [BJ] and RCIC turbine exhaust vacuum breaker lines as an extension of primary containment. The analysis was initiated as a result of an issue raised by the NRC Diagnostic Evaluation Team (DET) on containment isolation of these lines. The HPCI and RCIC vacuum breaker line modifications were installed at the recommendation of General Electric during the final stages of construction of the FitzPatrick Plant to prevent water hammer due to siphoning of water into the turbine exhaust line from steam condensation after turbine shutdown and during a postulated LOCA when the Primary Containment [NH] pressure suppression chamber (torus) becomes pressurized. As configured, the RCIC steam line runs parallel to the RCIC vacuum breaker line for about six (6) feet. In this region the lines are approximately 19 inches apart, and the RCIC line is located approximately seven (7) inches higher. It is at this point that a pipe whip restraint is required to limit the potential pipe movement of the RCIC steam line during a postulated break to assure that it will not impact the adjacent RCIC vacuum breaker line. The HPCI vacuum breaker line is satisfactorily protected from the impact of postulated breaks at the HPCI steam supply line by two (2) existing pipe whip restraints, and is not affected by the results of the new analysis.

Cause

The cause of this event is that the original vacuum breaker line design basis analysis was limited to the impact of HELB on the torus and as a result considered damage of the RCIC vacuum breaker line (due to a RCIC steam line break) an acceptable failure based on safe shutdown of the plant not being affected. The new analysis, with increased scope by considering the vacuum breaker lines as part of the containment, evaluated the protection of both the torus and the vacuum breaker lines against HELB, requiring piping that cannot be isolated from containment to be protected from the effects of pipe whip and jet impingement.

Analysis

Failure of the RCIC turbine exhaust vacuum breaker line due to a break in the RCIC steam line, although rendering the RCIC system inoperable, would not have affected the safe shutdown of the plant. The RCIC system is not required to provide emergency core cooling and there is no functional purpose for the vacuum breaker line when the RCIC steam line is broken. Also, the failure of the vacuum breaker line would result in a 1 1/2 inch diameter opening to the torus vapor space which could adequately be controlled by available safety systems.

The primary containment is the primary barrier designed to withstand the pressures and temperatures resulting from a design basis Loss Of Coolant Accident (LOCA) and provides hold-up for radioactive decay of any radioactive material released from the reactor coolant system pressure boundary. For postulated LOCAs, which would include primary containment leakage as a result of a RCIC steam line break which damages the RCIC vacuum breaker line, fission gases would be released to the reactor building (secondary containment) [NG] atmosphere. Signals generated by reactor water level, primary containment drywell pressure, and/or HPCI initiation would result in automatic reactor building isolation and starting of Standby Gas Treatment (SBGT) [BH]. Operation of SBGT would filter radioactive materials contained in the reactor building atmosphere and discharge to the plant stack. Since the postulated leakage path from a damaged RCIC vacuum breaker line is from the torus vapor air space, the scrubbing action of the torus water, dilution and plateout within the reactor building, filtering by SBGT and elevated release from the plant stack would all act to have a mitigating effect on offsite dose rates.

It should be noted that this release scenario is very unlikely. The LOCA with core damage is a low probability event and failure of the RCIC steam line is also a low probability event. In addition, failure of the RCIC steam line, which is a passive component, would have to occur in a manner and location where the RCIC vacuum breaker line could be damaged due to pipe whip without there being an automatic isolation of the steam line due to high area temperature, high steam line flow, low steam line pressure, or failure of both RCIC steam line isolation valves. The combination of a core damaging LOCA, failure of the RCIC steam line and failure to isolate the RCIC steam line is not considered to be a credible sequence of events.

Because the FitzPatrick HELB analysis in the FSAR states that the containment was protected against high energy line breaks, the lack of pipe whip protection for the RCIC vacuum breaker line is being considered a condition which is outside the plant design basis and thus requires a report under 10CFR 50.73(a)(2)(ii)(B).

Corrective Actions

A pipe whip restraint will be installed on the RCIC steam supply line prior to startup from the current outage to protect the RCIC vacuum breaker line from damage due to a postulated pipe break.

Additional Information

Failed Components: None

Previous Similar Events: None