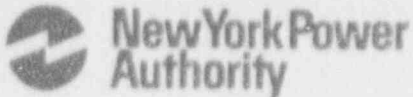


James A. FitzPatrick
Nuclear Power Plant
P.O. Box 41
Lycorning, New York 13093
315 342-3840



Harry P. Salmon, Jr.
Resident Manager

November 5, 1992
JAFP-92-0775

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

SUBJECT: DOCKET NO. 50-333
LICENSEE EVENT REPORT: 91-033-01 - Voluntary Report
Concerning Potential Torus
Pressure Instrument Errors

Dear Sir:

This update report is submitted as a voluntary report.

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

Very truly yours,

HARRY P. SALMON, JR.

WVC
HPS:WVC:tld
Enclosure

cc: USNRC, Region 1
USNRC Resident Manager
INPO Records Center

9211100275 921105
PDR ADOCK 05000333
S PDR

cert # P238254841

JE22

LICENSEE EVENT REPORT (LER)

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.

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 5

TITLE (4)

Voluntary Report Concerning Potential Torus Pressure Instrument Errors

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	2	1	9	1	9	1	0	3	3	0	5	0	0	0		
1	2	1	9	1	9	1	0	3	3	0	5	0	0	0		

THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR 5. (Check one or more of the following) (11)

OPERATING MODE (9)	20.402(b)	20.405(c)	60.73(a)(2)(iv)	71(b)
POWER LEVEL (10)	20.405(a)(1)(i)	60.36(c)(1)	60.73(a)(2)(v)	73.71(c)
	20.405(a)(1)(ii)	60.36(c)(2)	60.73(a)(2)(vi)	<input checked="" type="checkbox"/> OTHER (Specify in Abstract below and in Text, NRC Form 366A)
	20.405(a)(1)(iii)	60.73(a)(2)(i)	60.73(a)(2)(vii)(A)	Voluntary Report
	20.405(a)(1)(iv)	60.73(a)(2)(ii)	60.73(a)(2)(vii)(B)	
	20.405(a)(1)	60.73(a)(2)(iii)	60.73(a)(2)(ix)	

LICENSEE CONTACT FOR THIS LER (12)

NAME

W. Verne Childs, Sr. Licensing Engineer

TELEPHONE NUMBER

AREA CODE

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 NRC	CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NRC

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)

UPDATE REPORT - PREVIOUS REPORT DATE: JANUARY 21, 1992

EIIIS Codes are in []

The plant was in normal shutdown with the mode switch in the refuel position when it was postulated on 12/19/91 that under Loss of Coolant Accident conditions, water may accumulate in primary containment [NH] pressure suppression chamber (torus) pressure sensing lines causing significant instrument error. The potentially effected instruments are for accident monitoring [IP], input to certain Safety Parameter Display System (SPDS) displays, and for control of reactor building-torus vacuum breaker isolation valves. On 4/29/92 Engineering provided the results of calculations, which show that the originally postulated errors due to water accumulation result in only approximately one-fourth of a drip leg being filled in 100 days at accident conditions. As a result, no errors are introduced and this LER is reclassified as a voluntary report.

LICENSEE EVENT REPORT (LER)
TEXT CONTINUATION

ESTIMATED BURDEN PER RESPONSE TO COMPL. WITH THIS INFORMATION COLLECTION REQUEST: 50.0 HRS. FORWARD COMMENT: 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.

FACILITY NAME (1) James A. FitzPatrick Nuclear Power Plant	DOCKET NUMBER (2) 0 5 0 0 0 3 3 8	LER NUMBER (6)			PAGE (3)		
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER			
		9 1	0 3 3	0 1	0 2	OF	0 5

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

UPDATE REPORT - PREVIOUS REPORT DATE: JANUARY 21, 1992

EIIIS Codes are in []

DESCRIPTION

On December 19, 1991, with the plant in a normal shutdown condition and the mode switch in the refuel position, it was postulated that during Loss of Coolant Accident (LOCA) conditions, several primary containment [NH] pressure suppression chamber (torus) instruments could have errors introduced as a result of the condensation of water in instrument sensing line.

The instruments affected by the postulated condensation of water in the sensing line are:

- Torus wide-range pressure transmitter 27PT-101B1. This pressure transmitter feeds control room torus pressure recorder 27PR-101B1 (which is part of post accident monitoring [IP] system) and plant computer [ID] point EPIC-A-1286 which is part of the Safety Parameter Display System (SPDS).
- Torus narrow-range pressure transmitter 27PT-101B. This pressure transmitter feeds control room torus pressure indicator 27PI-101A (which is part of the post accident monitoring [IP] system) and plant computer [ID] point EPIC-A-1294 which is part of the SPDS.
- Torus wide-range pressure transmitter 27PT-101A. This pressure transmitter feeds control room torus pressure indicator 27PI-101A (which is part of post accident monitoring [IP] system) and plant computer [ID] point EPIC-A-1294 which is part of the SPDS.
- Torus pressure switch 27PS-110B which senses differential pressure between the torus and reactor building [NG] (secondary containment). Pressure switch 27PS-110B provides a signal to open primary containment [NH] isolation valve 27AOV-101B when torus pressure is less than reactor building pressure by no more than 0.5 psi. This allows vacuum breaker 27VB-7 to open and relieve the vacuum in the primary containment.

LICENSEE EVENT REPORT (LER)
TEXT CONTINUATION

ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS INFORMATION COLLECTION REQUEST: 600 HRS. FORWARD COMMENTS REGARDING BURDEN ESTIMATE TO THE RECORDS AND REPORTS MANAGEMENT BRANCH (F-530), U.S. NUCLEAR REGULATORY COMMISSION, WASHINGTON, DC 20545, AND TO THE PAPERWORK REDUCTION PROJECT (3150-0104), OFFICE OF MANAGEMENT AND BUDGET, WASHINGTON, DC 20503.

FACILITY NAME (1) James A. FitzPatrick Nuclear Power Plant	DOCKET NUMBER (2) 0 5 0 0 0 3 3 3	LER NUMBER (6) <table border="1"><tr><th data-bbox="1049 266 1131 308">YEAR</th><th data-bbox="1131 266 1296 308">SEQUENTIAL NUMBER</th><th data-bbox="1296 266 1404 308">REVISION NUMBER</th></tr><tr><td data-bbox="1049 308 1131 368">9 1</td><td data-bbox="1131 308 1296 368">0 3 3</td><td data-bbox="1296 308 1404 368">0 1</td></tr></table>	YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	9 1	0 3 3	0 1	PAGE (3) 0 3 OF 0 5
YEAR	SEQUENTIAL NUMBER	REVISION NUMBER							
9 1	0 3 3	0 1							

TEXT (If more space is required, use additional NRC Form 366A (2) (17))

The instrument sensing line connected to the torus contains a vertical leg of approximately 20 feet which is not sloped back toward the torus. During design basis Loss of Coolant Accident (LOCA) conditions the atmosphere in the torus air space will consist of non-condensable gases (primarily nitrogen) and water vapor with a relative humidity of 90 percent at a temperature of approximately 209°F. At the same time the instrument sensing lines, which are routed to an instrument rack in the same general area as emergency core cooling system pumps and piping, will be a temperature of 104°F or lower.

This differential temperature of more than 100°F results in conditions in which water vapor in the torus air space will migrate by the process of diffusion to the internal volume of the sensing line where the partial pressure of the water vapor is lower due to the sensing line being colder. When the water vapor reaches the relatively cool sensing line it will be condensed. It was postulated that this process would continue until the conditions that cause the different partial pressure of water vapor in the two volumes of concern (the torus air space and the internal volume of the sensing lines) are eliminated. The collected water in the tubing would, after filling a drip leg at the lowest point in the tubing, cause the sensed torus pressure to be higher than the actual pressure. As a result, the torus pressure information provided to operators on control room [NA] control panels and SPDS displays could result in improper (or improperly timed) decisions concerning accident mitigation and management. Similarly, SPDS displays in the Technical Support Center and Emergency Operation Facility (EOF) [NC] would contain the same erroneous information.

It was also postulated that the collection of water in the sensing line for the pressure switch which controls the opening of the reactor building-torus vacuum breaker isolation valve would result in a condition in which the vacuum breaker isolation valve would not open until the torus vacuum is greater than the Technical Specification 3.7.A.4.a limit of 0.5 psi. The redundant pressure switch (which controls the isolation valve for the redundant vacuum breaker valve) also contains a vertical leg of approximately 10 feet. As a result, it was postulated that a similar potential problem existed for the redundant instrumentation resulting in conditions where the operation of neither vacuum breaker would take place within the Technical Specification limit of equal to or less than 0.5 psi.

LICENSEE EVENT REPORT (LER)
TEXT CONTINUATION

ESTIMATE/D BURDEN PER RESPONSE TO COMPLY WITH THIS INFORMATION COLLECTION REQUEST: 50.8 HRS. FORWARD COMMENTS REGARDING BURDEN ESTIMATE TO THE RECORDS AND REPORTS MANAGEMENT BRANCH (F-530), U.S. NUCLEAR REGULATORY COMMISSION, WASHINGTON, DC 20545, AND TO THE PAPERWORK REDUCTION PROJECT (3150-01C4), OFFICE OF MANAGEMENT AND BUDGET, WASHINGTON, DC 20503.

FACILITY NAME (1) James A. FitzPatrick Nuclear Power Plant	DOCKET NUMBER (2) 0 5 0 0 0 3 3 B 9 1	LER NUMBER (8) <table border="1"> <tr> <th>YEAR</th> <th>SEQUENTIAL NUMBER</th> <th>REVISION NUMBER</th> </tr> <tr> <td>—</td> <td>0 3 3</td> <td>— 0 1</td> </tr> </table>	YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	—	0 3 3	— 0 1	PAGE (9) 0 4 1 0 5
YEAR	SEQUENTIAL NUMBER	REVISION NUMBER							
—	0 3 3	— 0 1							

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

An examination of plant operating records revealed a similar condition exists during normal plant operation for a portion of each year. During winter months the torus water temperature is normally approximately 75°F. At the same time, the temperature of the vertical portion of the sensing line is approximately 10° to 12°F cooler. The differences in the partial pressure of water vapor in the two volumes of concern is much less than that which exists during and following a LOCA, resulting in a much slower diffusion of water vapor from the torus air space to the instrument sensing line. It should also be noted that the drip leg (collection volume) consisting of approximately four linear feet of instrument line tubing is connected at the lowest point in the instrument sensing line and is periodically checked for the presence of water. This check for the presence of water is done once each three months during time periods when primary containment integrity is not required. Past checks for water have not indicated that any water actually condenses in the sensing line and collects in the drip leg.

Engineering calculations were performed to determine the rate at which condensed water vapor would accumulate during design basis LOCA and severe accident conditions. The calculations considered two phenomena which allow water vapor to reach the portions of the sensing lines when condensed water vapor could accumulate and result in sensing error:

- 1) Induced flow caused by condensation of water vapor pushed into the sensing lines by pressurization of the torus to peak accident pressure and
- 2) Diffusion of water vapor from the torus atmosphere through the sensing lines.

The calculations show that for a 100 day period with accident conditions, the maximum volume of accumulated water would fill approximately 1 foot of the four foot length of drip leg. Therefore, the pressure sensing instrumentation would not be affected.

Cause and Analysis

The magnitude of the postulated errors in torus pressure sensing instruments due to an accumulation of water (if any) was not known when this LER was originally submitted on January 21, 1992. Engineering informed the plant of the results of the calculations on April 29, 1992. Since the calculations show that the originally postulated pressure sensing errors will not be introduced by design basis LOCA or severe accident conditions for a 100 day period the postulated event is not a condition which requires a report under 10CFR50.73. Accordingly this LER has been reclassified as a "voluntary" report and no event cause is provided.

LICENSEE EVENT REPORT (LER)
TEXT CONTINUATION

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.

FACILITY NAME (1) James A. FitzPatrick Nuclear Power Plant	DOCKET NUMBER (2) 0 5 0 0 0 3 3 3	LER NUMBER (6)			PAGE (3)		
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER			
		9 1	0 3 3	9 1	0 5	OF	0 5

TEXT (If more space is required, use additional NRC Form 365A's) (17)

Corrective Action

1. Calculations were performed to determine the rate at which water would collect in the torus pressure sensing lines.

Additional Information

Failed Components: None

Previous Similar Events: None

Reason for Update Report: This LER has been updated to provide the results of calculations performed to determine the rate at which water would collect in the torus pressure sensing lines. Since the calculations show that water will not collect in the sensing lines in sufficient quantity to result in pressure sensing errors during 100 days of accident conditions no "event" as defined by 10CFR50.73 or NUREG 1022 exists. Accordingly, this LER is also reclassified as a voluntary report.