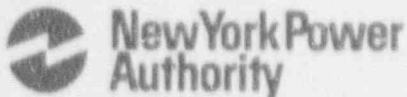


James A. FitzPatrick  
Nuclear Power Plant  
P.O. Box 41  
Lycoming, New York 13793  
315 342-3840



Radford J. Converse  
Resident Manager

February 21, 1992  
JAFF-92-0157

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

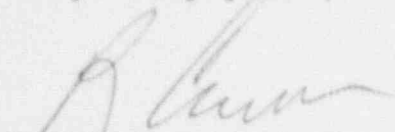
SUBJECT: DOCKET NO. 50-333  
LICENSEE EVENT REPORT: 92-005-00 - Primary  
Containment Isolation Valve  
Remote Manual Closure Design  
Error

Dear Sir:

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

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

Very truly yours,



RADFORD J. CONVERSE

RJC:WVC:lar

Enclosure

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

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LICENSEE EVENT REPORT (LER)

FACILITY NAME (1) <b>JAMES A. FITZPATRICK NUCLEAR POWER PLANT</b>	DOCKET NUMBER (2) <b>0 5 0 0 0 3 3 3 1</b>	PAGE (3) <b>1 OF 0 4</b>
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TITLE (4) **Primary Containment Isolation Valves Remote Manual Closure Function Inoperable Due to a Design Error and Inadequate Operating Experience Review**

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 (8)
01	22	92	92	005	00	02	21	92				0 5 0 0 0
												0 5 0 0 0

OPERATING MODE (9) <b>N</b>	THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR § (Check one or more of the following) (11)									
POWER LEVEL (10) <b>0 0 0</b>	<input type="checkbox"/> 20.400(b)	<input type="checkbox"/> 20.400(a)	<input type="checkbox"/> 20.73a(2)(iv)	<input type="checkbox"/> 73.71(b)						
	<input type="checkbox"/> 20.400a(1)(i)	<input type="checkbox"/> 20.30a(1)	<input checked="" type="checkbox"/> 20.73a(2)(v)	<input type="checkbox"/> 73.71(c)						
	<input type="checkbox"/> 20.400a(1)(ii)	<input type="checkbox"/> 20.30a(2)	<input type="checkbox"/> 20.73a(2)(vi)	OTHER (Specify in Abstract below and in Part 306A)						
	<input type="checkbox"/> 20.400a(1)(iii)	<input type="checkbox"/> 20.73a(2)(i)	<input type="checkbox"/> 20.73a(2)(vii)(A)							
	<input type="checkbox"/> 20.400a(1)(iv)	<input checked="" type="checkbox"/> 20.73a(2)(ii)	<input type="checkbox"/> 20.73a(2)(vii)(B)							
	<input type="checkbox"/> 20.400a(1)(v)	<input type="checkbox"/> 20.73a(2)(iii)	<input type="checkbox"/> 20.73a(2)(viii)							

LICENSEE CONTACT FOR THIS LER (12)	
NAME <b>W. VERNE CHILDS, SENIOR LICENSING ENGINEER</b>	TELEPHONE NUMBER AREA CODE: <b>3 1 5</b> NUMBER: <b>3 4 9 - 6 0 7 1</b>

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
<input type="checkbox"/> YES (If yes, complete EXPECTED SUBMISSION DATE)	<input checked="" type="checkbox"/> NO					

ABSTRACT (Limit to 1400 gross Ls, approximately 1700 net single-space typewritten lines) (16)

IIIS Codes in [ ]

The plant was shutdown and in the cold condition for maintenance and refuel.

On 1/22/92 it was determined that the remote manual closure feature of primary containment [NH] isolation valves from the pressure suppression chamber (torus) for High Pressure Coolant Injection (HPCI) [BJ] and Reactor Core Isolation Cooling (RCIC) [BN] pump suction lines was defeated under certain conditions. When HPCI and/or RCIC suction is automatically transferred to the torus due to high torus level and/or low condensate storage tank [KA] level, the remote manual closure capability of the pump suction valves described in the Final Safety Analysis Report is defeated. The event was caused by a design error and inadequate review of industry operating experience. The design error will be corrected prior to plant start-up and systematic review of other potentially similar conditions will be completed.

LER-91-026 is a similar event.

## LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

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   2	--   0   0   5	--   0   0	0   2	OF 0   4

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

EIS Codes are in [ ]

Description

The plant was shutdown and in the cold condition for maintenance and refueling.

On January 22, 1992 it was determined that certain primary containment [NH] isolation valves will not remain closed when given a "remote manual" close signal under certain conditions. Specifically, the High Pressure Coolant Injection (HPCI) system [BJ] and Reactor Core Isolation Cooling (RCIC) system [BN] primary containment pressure suppression chamber (torus) pump suction valves will not remain closed when given a remote manual close signal if signals for shifting the pump suction source from the Condensate Storage Tanks (CSTs) [KA] to the torus are present.

The HPCI and RCIC systems are designed to automatically shift the pump suction source from CSTs to the torus if loss of the normal pump suction from the CSTs is anticipated due to low CST level or due to the manual valves in the suction path from the CST being in any position other than fully open. The HPCI system suction is also designed to shift suction to the torus if torus level is six (6) inches or more above normal. These design features ensure that an adequate pump suction source is available and that the primary containment free space volume (floodable volume) is preserved by limiting the increase in torus inventory.

Both the HPCI and RCIC system suction lines from the torus are provided with primary containment isolation valves. The HPCI system torus suction isolation valves (23MOV-57 and -58) automatically close in response to HPCI system steam leak isolation signals (high steam flow, low steam line pressure, high steam line area temperature, and/or high turbine exhaust diaphragm pressure) or in response to a remote manual (main control room) signal. RCIC system torus suction isolation valves (13MOV-39 and -41) are designed to close in response to a remote manual (main control room) signal.

The plant Final Safety Analysis Report (FSAR), Section 7.3, Table 7.3-1, lists RCIC valves 13MOV-39 and -41, for primary containment penetration 16X-224, and HPCI valves 23MOV-57 and -58, for primary containment penetration 16X-226, as valves having remote manual closure capability. Plant procedure AP-1.16, which lists primary containment isolation valves required by Technical Specification 3.7.D, also lists the same valves and requires the same remote manual closure capability. No documentation exists to indicate that the remote manual isolation design feature is intended to be bypassed when the HPCI or RCIC pump suction source has been automatically shifted to the torus.

LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

FACILITY NAME (1)  JAMES A. FITZPATRICK  NUCLEAR POWER PLANT	DOCKET NUMBER (2)  0 5 0 0 0 3 3 3	LER NUMBER (5)			PAGE (3)	
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER		
		9 2	0 0 5	0 0	0 3	OF 0 4

TEXT (If more space is required, use additional NRC Form 368A's) (17)

The lack of the remote manual closure function, under the conditions described above, for valves 13MOV-39 and -41 and 23MOV-57 and -58 was discovered as the result of review of Institute of Nuclear Power Operations (INPO) NETWORK information for applicability to this facility when a NETWORK entry indicated that a similar deficiency existed at another facility.

Cause

The primary cause of the event was an original construction design error.

A contributing cause was an inadequate review of a similar deficiency involving the remote manual closure capability of core spray system [BM] pump minimum flow valves which was reported in LER-91-026. The engineering review which resulted in discovery of the deficiency concerning the core spray system pump minimum flow valves was not broad enough. The review was limited to minimum flow lines with primary containment isolation functions. As a result, the discovery that one design feature (remote manual isolation) was defeated by another design feature (shifting of HPCI and RCIC suction to the torus) was not made until after a similar facility discovered the same deficiency during an engineering review that was conducted in response to an INPO NETWORK NRC plant status entry as a result of Emergency Notification System (ENS) notification for the deficiency which was reported in LER-91-026.

Analysis

The HPCI system is a safety-related system designed to mitigate Loss of Coolant Accidents (LOCAs) discussed in the FSAR which are not large enough to result in rapid depressurization of the reactor. Automatic initiation of HPCI in response to high primary containment drywell pressure or low reactor water level provides adequate core cooling by injection of water from CSTs (or from the torus) while reducing reactor pressure due to the injection of the relatively cold water and by use of reactor steam to provide driving force for the pump drive turbine. When pressure has been sufficiently reduced to allow operation of low pressure emergency core cooling systems (ECCS), that is, Residual Heat Removal/Low Pressure Coolant Injection (RHR/LPCI) [BO] and/or core spray [BM], these systems provide adequate core cooling.

The RCIC system (which is not designed as a safety-related system) is designed to provide a means of removing small amounts of energy from the reactor while maintaining reactor water level in the event that the normal reactor heat sink is not available. The RCIC system also functions during small LOCAs in the same manner as HPCI except the water injection flow rate of RCIC is approximately 10% of the HPCI flow rate.

LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

FACILITY NAME (1)  JAMES A. FITZPATRICK NUCLEAR POWER PLANT	DOCKET NUMBER (2)  0   5   0   0   0   3   3   3	LER NUMBER (8)			PAGE (3)	
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER		
		9   2	-   0   0   5	-   0   0	0   4	OF 0   4

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

The primary containment isolation valves installed in the HPCI and RCIC torus suction lines are intended to provide a means to close (isolate) the line in the event of piping failures to prevent the loss of water from the torus and to contain radioactive material within the primary containment. The inability to close the valves by remote manual operator action under the conditions described above is considered to be a condition outside of the plant design basis and thus requires a report under 10 CFR 50.73(a)(2)(ii)(B).

The event is also considered to require a report under 10 CFR 50.73(a)(2)(v)(C) and (D) as a condition that alone could prevent fulfillment of safety functions needed to control the release of radioactive material and mitigate the consequences of an accident.

Corrective Action

1. No immediate action was required because the plant was shutdown for maintenance and refuel. Primary containment integrity was not required.
2. A systematic review of the design of primary containment isolation valve control circuits has been initiated. Particular emphasis will be placed on the careful review of cases where dual function valves (that is, valves with safety-related functions in both the open and closed positions) exist. Identification of valves with dual functions will be completed by March 1, 1992.
3. Review of the design of the control circuits of isolation valves with dual functions against design basis documentation will be completed to allow correction of the deficiencies (or justification for plant operation without correction) prior to plant start-up following the 1992 Refuel Outage. Due date April 1, 1992.
4. The control circuits for valves 13MOV-39 and -41 and 23MOV-57 and -58 will be modified to correct the deficiency prior to start-up following the 1992 Refuel Outage. Scheduled due date April 1, 1992.

Additional Information

Failed Components: None

Previous Similar Events: LER-91-026 described a similar event.