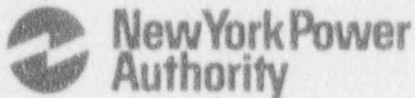


James A. FitzPatrick  
Nuclear Power Plant  
P.O. Box 41  
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315 342-3840



Harry P. Salmon, Jr.  
Resident Manager

March 15, 1994  
JAFF-94-0158

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

SUBJECT: DOCKET NO. 50-333  
LICENSEE EVENT REPORT: LER-91-022-01:

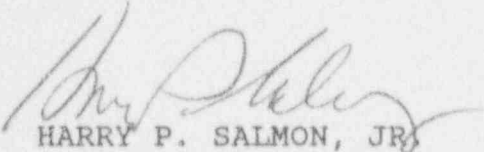
Primary Containment Isolation System - Spurious  
Actuation

Dear Sir:

This updated report is submitted in accordance with 10 CFR 50.73(a)(2)(iv). The reason for providing this update is to ensure that the resolution to the spurious trips on the primary containment high range monitors reported in this and other LERS is consistent.

Questions concerning this report may be addressed to Mr. Eric Mulcahey at (315) 349-6324.

Very truly yours,



HARRY P. SALMON, JR.

HPS:EAM:tlc

Enclosure

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

9403300023 940315  
PDR ADOCK 05000333  
S PDR

Handwritten initials 'JEP' and the number '11' in the bottom right corner of the page.

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)  
James A. FitzPatrick Nuclear Power Plant

DOCKET NUMBER (2)  
05000333

PAGE (3)  
01 OF 64

TITLE (4)  
Primary Containment Isolation System - Spurious Actuation

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
10	15	91	91	022	01	03	15	94	FACILITY NAME	DOCKET NUMBER 05000
									FACILITY NAME	DOCKET NUMBER 05000

OPERATING MODE (9) N	THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more)(11)									
POWER LEVEL (10) 100	20.402(b)	20.405(c)	<input checked="" type="checkbox"/>	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)	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  
Mr. Eric Mulcahey

TELEPHONE NUMBER (Include Area Code)  
(315) 349-6324

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)

YES (If yes, complete EXPECTED SUBMISSION DATE).	<input checked="" type="checkbox"/> NO	EXPECTED SUBMISSION DATE (15)	MONTH	DAY	YEAR
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ABSTRACT (Limit to 1400 spaces, i.e., approximately 15 single-spaced typewritten lines) (16)

Update Report - Previous Report Date: 11/13/91

A spurious primary containment high radiation monitor A isolation signal occurred at 0201 on 10/15/91. The primary containment vent and purge valves which are isolated by this signal were already in the closed position. Redundant instrumentation confirmed that containment radiation levels were normal and logic circuitry reset immediately. The transient input signal which activated the monitor trip is believed to have been generated by the actuation of the off-gas vent line isolation delay timer which was initiated during the performance of surveillance testing. The exact nature of the interaction had not been identified at that time. A procedure was developed to closely examine the relationship of actuation to the noise transient during the 1992 refueling outage. The pathways for initiation of the monitor trips was found to be an added input filter assembly. The filters were removed from the monitor inputs before the plant was restored in January, 1993, to eliminate monitor trips by this pathway.

LICENSEE EVENT REPORT (LER)  
TEXT CONTINUATION

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FACILITY NAME (1)	DOCKET NUMBER (2)	LER NUMBER (6)			PAGE (3)
James A. FitzPatrick Nuclear Power Plant	05000333	YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	02 OF 04
		91	022	01	

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

Update Report - Previous Date, November 13, 1991  
EIIIS Codes are in []

Description

The plant was operating at full power on October 15, 1991. At 0201, during the performance of the Off-Gas Line Isolation Logic System Functional Test (ST-10A) an up and downscale deflection of the primary containment high radiation monitor A [IL] tripped the primary containment [NH] vent and purge valves isolation logic circuitry [JE]. The valves were already closed due to normal operation line-up; therefore, no action occurred beyond the actuation of the logic circuitry. Redundant instrumentation confirmed that containment radiation levels were normal. Primary containment high range monitor A isolation was immediately reset and a work request was initiated for the Instrument and Controls Department to investigate the cause of the momentary activation.

Cause

At the time that the upscale and downscale transient occurred on the primary containment high range monitor A, a Control Room operator performing Surveillance Test (ST) ST-10A observed that the off-gas isolation valve logic circuit delay timer had completed its 15 minute interval cycle and timer appeared to be performing the reset operation.

The ST is performed by initiating isolation trips from two off-gas radiation monitors A and B. This isolation action is delayed for 15 minutes by a timing device. In order to inhibit the physical operation of the off-gas isolation valve, a lead is lifted from the isolating timer and a volt meter is inserted with connections from the timer contact terminal to the station ground. The location of the meter is normally in the rear of the cabinet. During this performance, in order to facilitate ease of observation a front sub-panel cover was removed and the meter placed in the opening. This resulted in the leads passing in the vicinity of the primary containment high range radiation monitor A physically located in the same panel.

After completion of the timing cycle, contacts are opened and the electrical presence of the voltage at the meter disappears and the timer is reset by the operation of an internal electrical solenoid being deenergized. At the time it was suspected but had not been proven that the reset operation of the timer introduced an electromagnetic pulse into the input of the primary containment high range monitor A due to proximity of the volt meter leads attachment to the timer. A test procedure was developed to explore the relationship between timer completion of the timing cycle and the activation of the monitor A.

LICENSEE EVENT REPORT (LER)  
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James A. FitzPatrick Nuclear Power Plant	05000333	YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	03 OF 04
		91	022	01	

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

After experiencing repeated actuation of the primary containment [NH] vent and purge isolation systems and also other ventilation systems by spurious (invalid) initiation of radiation monitors, a radiation monitoring specialist was contacted to perform a field investigation and analysis of the causes. To provide guidance and documentation of results, procedure IMP-T29A and B, 27RM 104A(B) Electrical Noise Testing was developed and implemented. This procedure was performed during the 1992 refueling outage.

The specialist started on December 9, 1991, with a preliminary inspection of the monitors environment, circuitry configuration, and interconnection relationships. The primary containment high range radiation monitor with a high number of random actuations were selected to be investigated first studying the sensitivity of the monitors to external (electrical and magnetic) noise. A possible pathway for the introduction of the noise into the input of the monitors had been identified from this preliminary investigation. In LER-91-030, it was described as a filtering network attached to the inputs of the high range radiation monitors which is believed to have been used for evaluations of Electromagnetic Interface (EMI) during monitoring installation field testing. In-depth analysis was performed to quantify the effect of the filter assembly on the monitors performance.

The filter was found to have a significant effect on EMI susceptibility. The assembly was poorly shielded and the assembly design was such that it would rectify (and the monitor would amplify) any EMI induced noise. This was verified by keying a hand-held radio to demonstrate the EMI susceptibility of the circuit with and without the filter in place.

Analysis

The activation of the primary containment vent and purge valves isolation logic is reportable under provisions of 10 CFR 50.73(a)(2)(iv) as an activation of an Engineered Safety Feature [JE]. There were no system or equipment failures. The isolation valves which received the close signal were already in the closed (isolated) radiation signal. there was no potential for adverse safety consequences generated by this event.

LICENSEE EVENT REPORT (LER)  
TEXT CONTINUATION

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FACILITY NAME (1)	DOCKET NUMBER (2)	LER NUMBERS (6)			PAGE (3)
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TEXT (If more space is required, use additional copies of NRC Form 366A) (17)

Corrective Actions

1. The event was immediately assessed for abnormal plant conditions and the primary containment radiation levels were found to be normal. Isolation logic was reset and a station work request initiated to the Instrument and Control Department for investigation.
2. A test procedure, IMP-T29A(B) 27RM-104A(B), Electrical Noise Testing, was developed to determine the nature of the interactions between performance of logic Surveillance Test 10A and other testing generated electrical noises and the initiation of the primary containment high range monitor A was caused by spurious electrical noises.
3. The attached filter to the high range radiation monitors was removed prior to restart after the 1992 outage. Also, the signal input cables were shortened and rerouted to lesson adverse effects of Electromagnetic Interference (EMI).

Additional Information

Related LERs:

- 91-030-01 Assemblies (filters) on the input of the primary containment high range radiation monitors have been the cause of the spurious isolations of the vent and purge valves.
- 91-029-01 Primary containment high range radiation monitor filter assemblies have caused spurious isolations of the vent and purge valves.
- 91-018 A random electrical noise spike (source unknown) caused primary containment high range monitor A to initiate an isolation of primary containment vent and purge isolation logic circuitry.
- 91-001 An electrical noise spike resulting from a high voltage measurement on service water process radiation monitor caused primary containment high range monitor B to initiate an isolation of primary containment vent and purge isolation valves.
- 90-028 An electrical noise spike resulting from a high voltage measurement on a radiation monitor caused a partial isolation of the Reactor Building ventilation system.