Constellation

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Timothy C. Peter
Site Vice President– JAF

JAFP-22-0048
November 22, 2022

United States Nuclear Regulatory Commission
Attn: Document Control Desk
Washington, D.C. 20555-0001

James A. FitzPatrick Nuclear Power Plant
Renewed Facility Operating License No. DPR-059
NRC Docket No. 50-333

Subject: LER: 2022-002-00, Mode Switch Failed to Bypass Low Main Steam Line in Mode 2 Resulting in MSIV and RPS System Actuation

Dear Sir or Madam:

This report is being submitted pursuant to 10 CFR 50.73(a)(2)(iv)(A).

There are no new regulatory commitments contained in this report.

Questions concerning this report may be addressed to Mr. Mark Hawes, Regulatory Assurance Manager (Acting), at (315) 349-6659.

Sincerely,

Timothy C. Peter
Site Vice President

TCP/MH/pa

Enclosure: LER: 2022-002-00, Mode Switch Failed to Bypass Low Main Steam Line in Mode 2 Resulting in MSIV and RPS System Actuation

cc: USNRC, Region I Administrator
USNRC, Project Manager
USNRC, Resident Inspector
INPO Records Center (IRIS)

NRC FORM 366 (08-2020) U.S. NUCLEAR REGULATORY COMMISSION

APPROVED BY OMB: NO. 3150-0104 EXPIRES: 08/31/2023

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LICENSEE EVENT REPORT (LER)

(See Page 3 for required number of digits/characters for each block)

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1. Facility Name	2. Docket Number	3. Page
James A. FitzPatrick Nuclear Power Plant	05000333	1 OF 3

4. Title

Mode Switch Failed to Bypass Low Main Steam Line in Mode 2 Resulting in MSIV and RPS System Actuation

5. Event Date			6. LER Number			7. Report Date			8. Other Facilities Involved	
Month	Day	Year	Year	Sequential Number	Revision No.	Month	Day	Year	Facility Name	Docket Number
									N/A	N/A
09	26	2022	2022	002	00	11	22	2022	Facility Name: N/A	Docket Number: N/A

9. Operating Mode	10. Power Level
2	000

11. This Report is Submitted Pursuant to the Requirements of 10 CFR §: (*Check all that apply*)

10 CFR Part 20	☐ 20.2203(a)(2)(vi)	☐ 50.36(c)(2)	☑ *50.73(a)(2)(iv)(A)*	☐ 50.73(a)(2)(x)
☐ 20.2201(b)	☐ 20.2203(a)(3)(i)	☐ 50.46(a)(3)(ii)	☐ 50.73(a)(2)(v)(A)	**10 CFR Part 73**
☐ 20.2201(d)	☐ 20.2203(a)(3)(ii)	☐ 50.69(g)	☐ 50.73(a)(2)(v)(B)	☐ 73.71(a)(4)
☐ 20.2203(a)(1)	☐ 20.2203(a)(4)	☐ 50.73(a)(2)(i)(A)	☐ 50.73(a)(2)(v)(C)	☐ 73.71(a)(5)
☐ 20.2203(a)(2)(i)	**10 CFR Part 21**	☐ 50.73(a)(2)(i)(B)	☐ 50.73(a)(2)(v)(D)	☐ 73.77(a)(1)
☐ 20.2203(a)(2)(ii)	☐ 21.2(c)	☐ 50.73(a)(2)(i)(C)	☐ 50.73(a)(2)(vii)	☐ 73.77(a)(2)(i)
☐ 20.2203(a)(2)(iii)	**10 CFR Part 50**	☐ 50.73(a)(2)(ii)(A)	☐ 50.73(a)(2)(viii)(A)	☐ 73.77(a)(2)(ii)
☐ 20.2203(a)(2)(iv)	☐ 50.36(c)(1)(i)(A)	☐ 50.73(a)(2)(ii)(B)	☐ 50.73(a)(2)(viii)(B)	
☐ 20.2203(a)(2)(v)	☐ 50.36(c)(1)(ii)(A)	☐ 50.73(a)(2)(iii)	☐ 50.73(a)(2)(ix)(A)	

☐ OTHER (Specify in Abstract below or in NRC Form 366A).

12. Licensee Contact for this LER

Licensee Contact	Telephone Number (Include Area Code)
Mr. Mark Hawes, Regulatory Assurance Manager (Acting)	315-349-6659

13. Complete One Line for each Component Failure Described in this Report

Cause	System	Component	Manufacturer	Reportable to IRIS		Cause	System	Component	Manufacturer	Reportable to IRIS

14. Supplemental Report Expected		15. Expected Submission Date	Month	Day	Year
☐ No	☑ Yes (If yes, complete 15. Expected Submission date)		01	31	2023

Abstract (Limit to 1560 spaces, i.e., approximately 15 single-spaced typewritten lines)

On September 26, 2022, at 0306 EDT, while the reactor was sub-critical and inserting control rods for a planned refueling outage, James A. FitzPatrick Nuclear Power Plant (JAF) experienced a reactor scram and Group 1 isolation on low steam line pressure logic. As a result of Group 1 isolation signal seven out of eight Main Steam Isolation Valves (MSIV) isolated. 'A' outboard MSIV (29AOV-86A) failed to isolate on the initial signal. The Reactor Protection System (RPS) actuated, resulting in all control rods being fully inserted, and manual actuation of RCIC. This event is reportable in accordance with 10 CFR 50.73(a)(2)(iv)(A).

The cause of RPS actuation was determined to be a failure of the reactor mode switch (05A-S1) to enact the logic required to bypass MSIV isolation on low main steam line pressure and RPS actuation on MSIV closed position. A supplement report will be submitted when all corrective actions have been finalized.

1. FACILITY NAME	2. DOCKET NUMBER	3. LER NUMBER		
		YEAR	SEQUENTIAL NUMBER	REV NO.
James A. FitzPatrick Nuclear Power Plant	05000 – 333	2022	– 002	– 00

NARRATIVE

Event Description

On September 26, 2022, James A. FitzPatrick Nuclear Power Plant (JAF) was reducing power for a planned plant shutdown for a refuel outage. At the time of the Scram, no structures, components, or systems were inoperable at the start of the event and contributed to the event. Control rods [EIIS identifier: AA] were being inserted and reactor power and pressure was decreasing.

At 0230, operators placed the mode switch (05A-S1) [JE] in Startup/Hot Standby (Mode 2).

At 0306, an unplanned Scram signal was received due to a Group 1 isolation on low main steam line [SB] pressure.

All control rods were fully inserted. Main Steam Isolation Valves (MSIV) [SB] isolated except 'A' outboard MSIV (29AOV-86A) failed to close. primary containment isolation system (PCIS) [JM] isolated valves in multiple systems according to group 1 isolation. When the PCIS was reset, 29AOV-86A was then manually isolated.

At 0530, Operators made the decision to place Reactor Core Isolation Cooling (RCIC) system [BN] in service to augment pressure and level to assist in transition to feedwater [SJ] and condensate [SD] systems. At 0751, RCIC was shut down and in a standby lineup.

The NRC was notified of this event at 0541 by ENS 56119 in accordance with 10 CFR 50.72(b)(2)(iv)(B) Reactor Protection System (RPS) actuation while critical and 10 CFR 50.72(b)(3)(iv)(A) for systems actuation. A reactor engineering analysis of reactor criticality was performed for the period of time prior to the event, and it was determined that the reactor was sub-critical. On October 4, 2022, ENS 56119 was updated to retract 10 CFR 50.72(b)(2)(iv)(B).

The 'A' outboard MSIV (29AOV-86A) failed to close, but the safety function for 'A' main steam line isolation was successful because the inboard MSIV isolated successfully.

Event Analysis

The Scram was initiated by an RPS actuation, which was initiated by MSIV closure, and MSIV isolation actuation was initiated by low main steam line pressure. The RPS actuation on MSIV closed position, and MSIV isolation on low main steam line pressure are not required to actuate in Mode 2 and should have been bypassed by mode switch position contacts. Mode 2 supports conditions at low reactor power, such as startup and shutdown, where the analyzed plant transient events for these required system actuations are not applicable.

The investigation confirmed the Mode Switch (05A-S1) was changed to Mode 2 by the Operator; however, some trip bypasses were not engaged. As the plant reduced power for the planned refuel outage, the un-bypassed trip setpoints actuated Group 1 isolation valves in multiple systems, including RPS, and MSIV system actuation. The automatic actuation of these systems and manual actuation of RCIC is reportable in accordance with 10 CFR 50.73(a)(2)(iv)(A). The Failure Modes Causal Team (FMCT) identified the most likely cause of failure of proper switch contacts make-up as performance of first-time preventative maintenance activity to inspect mode switch on operation. During this activity the mode switch was deliberately operated slowly to perform detailed inspection of switch components and gearing. This style of operation resulted in all contacts not making up properly when switch was operated.

Similar Events

No similar events were identified at JAF.

Corrective Actions

Completed Actions

A Failure Mode Causal Team (FMCT) was formed to identify most likely causes and assist in completion of troubleshooting actions prior to plant start-up. During troubleshooting, no abnormal component degradation was identified when 05A-S1 was inspected. Prior to startup, 05A-S1 was tested satisfactorily.

Operating procedure OP-65 revision was completed prior to reactor start-up adding requirements to ensure when the mode switch position is changed the proper switch contact logic is validated by redundant indications.

29AOV-86A was repaired prior to startup with a new air pack and solenoid valve cluster assembly. The replaced items were sent to PowerLabs for failure analysis.

Planned Actions

An investigation into the cause of 05A-S1 contacts not bypassing trip setpoints is ongoing and will be submitted as a supplement to this event report by January 31, 2023.

Safety Significance

There were no actual or potential nuclear or radiological consequences during this event.

Plant systems operated in response to this event as expected with the exception that a single component (29AOV-86A) of the MSIV system did not isolate. The redundant in inboard component fulfilled the safety function of the MSIV system. In addition, Safety/relief valves were not required to control pressure.

References

Issue Report, IR 04524574, Reactor Scram from Mode 2 During Plant Shutdown, dated September 26, 2022

Issue Report, IR 04524581, ‘A’ Outboard MSIV Failed to Close on GP 1 Isolation, dated September 26, 2022