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December 17, 2012
JAFF-12-0151

Michael J. Colomb
Site Vice President - JAF

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

SUBJECT: LER: 2012-006, Loss of Safety Function for RHR Shutdown Cooling
Isolation Function Due to Reference Leg Leakage during Maintenance
James A. FitzPatrick Nuclear Power Plant
Docket No. 50-333
License No. DPR-59

Dear Sir or Madam:

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

There are no commitments contained in this report.

Questions concerning this report may be addressed to Mr. Chris Adner, Licensing Manager, at
(315) 349-6766.

Sincerely,

A handwritten signature in black ink, appearing to read "Michael J. Colomb".

Michael J. Colomb
Site Vice President

MC/CA/mh

Enclosure(s): JAF LER 2012-006, Loss of Safety Function for RHR Shutdown
Cooling Isolation Function Due to Reference Leg Leakage during
Maintenance

cc: USNRC, Region 1
USNRC, Project Directorate
USNRC, Resident Inspector
INPO Records Center (ICES)

LICENSEE EVENT REPORT (LER)

Estimated burden per response to comply with this mandatory collection request: 80 hours. Reported lessons learned are incorporated into the licensing process and fed back to industry. Send comments regarding burden estimate to the Records and FOIA/Privacy Service Branch (T-5 F53), U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, or by internet e-mail to infocollects.resource@nrc.gov, and to the Desk Officer, Office of Information and Regulatory Affairs, NEOB-10202, (3150-0104), Office of Management and Budget, Washington, DC 20503. If a means used to impose an information collection does not display a currently valid OMB control number, the NRC may not conduct or sponsor, and a person is not required to respond to, the information collection.

1. FACILITY NAME

James A. FitzPatrick Nuclear Power Plant

2. DOCKET NUMBER

05000333

3. PAGE

1 OF 4

4. TITLE

Loss of Safety Function for RHR Shutdown Cooling Isolation Function Due to Reference Leg Leakage during Maintenance

5. EVENT DATE			6. LER NUMBER			7. REPORT DATE			8. OTHER FACILITIES INVOLVED	
MONTH	DAY	YEAR	YEAR	SEQUENTIAL NUMBER	REV NO	MONTH	DAY	YEAR	FACILITY NAME	DOCKET NUMBER
10	16	12	2012	- 006 -	00	12	17	12	N/A	05000
									N/A	05000

9. OPERATING MODE

4

11. THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check all that apply)

- | | | | |
|---|---|---|---|
| <input type="checkbox"/> 20.2201(b) | <input type="checkbox"/> 20.2203(a)(3)(i) | <input type="checkbox"/> 50.73(a)(2)(i)(C) | <input type="checkbox"/> 50.73(a)(2)(vii) |
| <input type="checkbox"/> 20.2201(d) | <input type="checkbox"/> 20.2203(a)(3)(ii) | <input type="checkbox"/> 50.73(a)(2)(ii)(A) | <input type="checkbox"/> 50.73(a)(2)(viii)(A) |
| <input type="checkbox"/> 20.2203(a)(1) | <input type="checkbox"/> 20.2203(a)(4) | <input type="checkbox"/> 50.73(a)(2)(ii)(B) | <input type="checkbox"/> 50.73(a)(2)(viii)(B) |
| <input type="checkbox"/> 20.2203(a)(2)(i) | <input type="checkbox"/> 50.36(c)(1)(i)(A) | <input type="checkbox"/> 50.73(a)(2)(iii) | <input type="checkbox"/> 50.73(a)(2)(ix)(A) |
| <input type="checkbox"/> 20.2203(a)(2)(ii) | <input type="checkbox"/> 50.36(c)(1)(ii)(A) | <input type="checkbox"/> 50.73(a)(2)(iv)(A) | <input type="checkbox"/> 50.73(a)(2)(x) |
| <input type="checkbox"/> 20.2203(a)(2)(iii) | <input type="checkbox"/> 50.36(c)(2) | <input type="checkbox"/> 50.73(a)(2)(v)(A) | <input type="checkbox"/> 73.71(a)(4) |
| <input type="checkbox"/> 20.2203(a)(2)(iv) | <input type="checkbox"/> 50.46(a)(3)(ii) | <input type="checkbox"/> 50.73(a)(2)(v)(B) | <input type="checkbox"/> 73.71(a)(5) |
| <input type="checkbox"/> 20.2203(a)(2)(v) | <input type="checkbox"/> 50.73(a)(2)(i)(A) | <input type="checkbox"/> 50.73(a)(2)(v)(C) | <input type="checkbox"/> OTHER |
| <input type="checkbox"/> 20.2203(a)(2)(vi) | <input type="checkbox"/> 50.73(a)(2)(i)(B) | <input checked="" type="checkbox"/> 50.73(a)(2)(v)(D) | Specify in Abstract below or in NRC Form 366A |

10. POWER LEVEL

000

12. LICENSEE CONTACT FOR THIS LER

FACILITY NAME

Mr. Chris Adner, Licensing Manager

TELEPHONE NUMBER (Include Area Code)

(315) 349-6766

13. COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT

CAUSE	SYSTEM	COMPONENT	MANU-FACTURER	REPORTABLE TO EPIX	CAUSE	SYSTEM	COMPONENT	MANU-FACTURER	REPORTABLE TO EPIX
X	JM	ISV	W165	Y					

14. SUPPLEMENTAL REPORT EXPECTED

Yes (If yes, complete 15. EXPECTED SUBMISSION DATE) NO

15. EXPECTED SUBMISSION DATE

MONTH	DAY	YEAR

ABSTRACT (Limit to 1400 spaces, i.e., approximately 15 single-spaced typewritten lines)

On October 16, 2012, at 0529, with the reactor in mode 4 and one channel for the Residual Heat Removal (RHR) shutdown cooling isolation function Operable, as permitted by TS 3.3.6.1, Operators identified a rising reactor water level indication on instruments associated with the 3A reactor water level reference leg while actual level remained constant. At 0700, Operators determined this condition rendered the automatic RHR shutdown cooling isolation function on low reactor water level Inoperable. Operators continued to monitor water level and were capable of performing manual isolation. In accordance with Tech Spec 3.3.6.1 Required Action J.1, immediate action was initiated to restore isolation capability. Automatic RHR shutdown cooling isolation capability on low reactor water level was restored at 1040.

The cause was leakage past Reference Leg 3A Backfill System injection isolation valves, 02-3NBI-371 and 02-3NBI-372 after they were isolated for maintenance. This drained the reference leg and caused an inaccurate water level signal.

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NARRATIVE

BACKGROUND

Reactor Water Level Low Isolation:

Low Reactor Pressure Vessel (RPV) water level indicates that the capability to cool the fuel may be threatened. Should RPV water level decrease too far, fuel damage could result. Therefore, isolation of some reactor vessel interfaces occur to isolate the potential sources of a leak.

The RHR Shutdown Cooling System isolation [EISS System Identifier: JM] supports actions to ensure that the RPV water level does not drop below the top of the active fuel during a vessel draindown event caused by a leak (e.g., external pipe leakage or inadvertent valve opening) in the RHR Shutdown Cooling System.

The safety function of a low RPV water level signal is to isolate RHR shutdown cooling pump suction valves and the inboard injection Low Pressure Coolant Injection (LPCI) [BO] valves.

Instrumentation:

RPV Water Level Low signal is initiated from four level transmitters that sense the pressure difference between a constant column of water (reference leg) and the actual water level (variable leg) in the vessel. Four channels (two channels per trip system) of the RPV Water Low Level Function are available to ensure that no single instrument failure can preclude the isolation function. Only one trip system of the RPV Water Level Low Function is required to be Operable in Modes 4 and 5, provided the RHR Shutdown Cooling System integrity is maintained. System integrity is maintained if the piping is intact and no maintenance or other activity is being performed that has the potential for draining the reactor vessel through the RHR system. During this event, one trip system had been taken out-of-service, as allowed by Technical Specifications, in order to mitigate the consequence of invalid actuations.

The RPV Water Low Level Function associated with RHR Shutdown Cooling System Isolation is only required to be Operable in Modes 3, 4, and 5 to prevent this potential flow path from lowering the reactor vessel level to the top of the fuel.

EVENT DESCRIPTION & ANALYSIS

On October 16, 2012, with one trip system of the RPV Water Level Low Function Operable, reactor water level instruments associated with Reference Leg 3A Backfill System all drifted upward following application of protective tagging to support maintenance of the Reference Leg Backfill System. The tagouts began at approximately 0500 when Reference Leg 3A Backfill System injection isolation valves 02-3NBI-371 and 02-3NBI-372 were isolated to perform filter replacement. At 0529 Operations discovered RPV water level drift for instruments associated with the 3A Reference Leg while actual reactor water level remained constant. This condition will give the RPV water low level instrumentation the false indication of higher RPV water level. As a consequence, automatic RHR shutdown cooling isolation function was declared Inoperable at 0700. A notification to the NRC was performed by ENS 48410. This follow-up Licensee Event Report is being performed in accordance with 10 CFR 50.73(a)(2)(v)(D), for an event which prevented a safety function to mitigate the consequences of an accident.

A field walkdown identified leakage from the down stream outlet bleed isolation valve, 02-3NBI-370, to a floor drain. The only path for leakage to valves 02-3NBI-370 is through 02-3NBI-371 and 02-3NBI-372. Leakby from the isolated 02-3NBI-371 and 02-3NBI-372 to the floor drain was causing the 3A Reference Leg to drain.

In accordance with Technical Specification 3.3.6.1 Required Action J.1, immediate action was initiated to restore isolation capability. RHR shutdown cooling isolation capability was restored at 1040 by changing the in-service

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RHR shutdown cooling subsystem per the Operation Procedure. On October 17, 2012, at 0048, Reference Leg 3A was restored.

The tag out listed the affected instrumentation and emphasized caution when breaching the system and that some water may be present due to the piping configuration. After the tag out was placed the operators did not verify that the system had stopped draining prior to leaving the area.

Isolation valves 02-3NBI-371 and 02-3NBI-372 are arranged in series and normally in the open position. They were only closed to assist in maintenance activities. The style of valve that failed is a Whitey/Swagelok model SS-6NBSW6T. It is a Severe-Service Union-Bonnet Needle Valve. It is a stainless steel valve with stainless steel ball stem and stellite stem tip. Some common causes for valve leakage include foreign material/contamination on the valve seat or seat damage by possible over tightening.

System Engineer and Operator walkdowns are performed on a regular basis; however, only external leakage would be identified. Packing replacement and packing gland torque / adjustment also address external leakage only and are not applicable to the apparent cause. The components primary maintenance rule function is to maintain the integrity of the reactor coolant pressure boundary. These backfill valves provide instrument line isolation.

At the time of this report, both 02-3NBI-371 and 02-3NBI-372 are in their normal lineup (Open). Therefore, the identified deficiency of leakby does not affect their required function. A corrective action will replace these two valves.

CAUSE OF EVENT

The apparent cause of this event is seat leakby of two isolation valves, 02-3NBI-371 and 02-3NBI-372, during a maintenance activity; while the other trip system was Inoperable as allowed by Technical Specifications. This caused drainage of the Reference Leg 3A which rendered the automatic RHR shutdown cooling isolation function Inoperable.

EXTENT OF CONDITION

The style of valve that failed is a Whitey/Swagelok model SS-6NBSW6T. This specific model valve is found in systems: Nuclear Boiler Instrumentation, Residual Heat Removal and Instrument Air. There are a total of 71 SS-6NBSW6T valves in the Nuclear Boiler Instrumentation system and these valves are only used in the backfill system. Residual Heat Removal and Instrument Air each contain 4 valves.

The normal line-up for the majority of the backfill system valves is in the open position. The bleed lines, test connections and one filter outlet valve are normally closed. With each backfill system in operation there is no adverse impact due to a valve leaking by its seat because the bleed lines and test connections can be capped and the filters are redundant/parallel.

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CORRECTIVE ACTIONS

Completed Actions

- Restored Reference Leg 3A.

Future Actions

- Evaluate replacement of isolation valves 02-3NBI-371 and 02-3NBI-372.
- Review Preventative Maintenance Strategies for 02-3NBI valves.
- Brief Operators on results of the Apparent Cause Evaluation.

ASSESSMENT OF SAFETY CONSEQUENCES

Radiological & Industrial Safety

There were no Radiological or Industrial Safety concerns associated with this event. Radiological safety is applicable for evaluation in this event and has no impact. The leakage from the valves was routed to a drain through tygon tubing. Industrial safety is applicable for evaluation in this event and has no impact

Nuclear Safety

While the reference leg was drained during this event the reactor was in mode 4 with normal water level. Operators monitored redundant channels for maintaining actual level. The automatic isolation function for Shut Down Cooling on low reactor water level was lost for a short period of time. No actual degradation of nuclear safety occurred. The reactor was shutdown so the water in the piping was at low temperature and pressure.

SIMILAR EVENTS

No similar events were identified.

REFERENCES

- JAF Condition Reports: CR-JAF-2012-07449
- JAF TS 3.3.6.1, Primary Containment Isolation Instrumentation
- JAF UFSAR 7.8, Reactor Vessel Instrumentation; UFSAR 7.3, Primary Containment and Reactor Vessel Isolation Control System