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JAFP-15-0147
December 28, 2015

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

Subject: LER: 2014-002-01, Secondary Containment Vacuum Below Technical Specification Limit

James A. FitzPatrick Nuclear Power Plant
Docket No. 50-333
License No. DPR-59

Reference: 1) Entergy letter, LER: 2014-002, Secondary Containment Vacuum Below Technical Specification Limit, JAFP-14-0147, dated December 19, 2014
2) Entergy letter, LER: 2015-005, Damper Failure Leads to Secondary Containment Vacuum Below Technical Specification Limit, JAFP-15-0131, dated November 17, 2015

Dear Sir or Madam:

This letter submits a revision to LER: 2014-002 submitted by letter dated December 19, 2014 [Reference 1]. Reference 1 was submitted to report 10 CFR 50.73(a)(2)(v)(C). During the evaluation of LER: 2015-005 [Reference 2], additional information was identified which is relevant to the events reported under LER: 2014-002. This letter submits a revision to LER: 2014-002 in order to include this information.

There are no new regulatory commitments contained in this report.

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

Sincerely,

Brian R. Sullivan
Site Vice President

BRS/CMA/mh

Enclosure(s): JAF LER 2014-002-01, Secondary Containment Vacuum Below Technical Specification Limit

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 FOIA, Privacy and Information Collections 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.

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4. TITLE
Secondary Containment Vacuum Below Technical Specification Limit

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	28	2014	2014	002	01	12	28	2015	N/A	N/A
									FACILITY NAME	DOCKET NUMBER
									N/A	N/A

9. OPERATING MODE	11. THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: <i>(Check all that apply)</i>			
1	<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)
100	<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 checked="" 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 type="checkbox"/> 50.73(a)(2)(v)(D)	Specify in Abstract below or in NRC Form 366A

12. LICENSEE CONTACT FOR THIS LER

LICENSEE CONTACT Mr. Chris M. Adner, Regulatory Assurance Manager	TELEPHONE NUMBER <i>(Include Area Code)</i> 315-349-6766
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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
A	VA	ZIS	H260	N	B	VA	CDMP	H260	N

14. SUPPLEMENTAL REPORT EXPECTED	15. EXPECTED SUBMISSION DATE	MONTH	DAY	YEAR
<input type="checkbox"/> YES <i>(If yes, complete 15. EXPECTED SUBMISSION DATE)</i> <input checked="" type="checkbox"/> NO				

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

At 1655 and 1708 on October 28, 2014, James A. FitzPatrick Nuclear Power Plant (JAF) was operating at 100 percent power when differential pressure of the Secondary Containment Reactor Building exceeded a Technical Specification Requirement. The requirement is for the Secondary Containment to have a ≥ 0.25 inch of vacuum water gauge compared to the external environment. The Reactor Building differential pressure decreased below 0.25 inch of vacuum water gauge twice: at 1655 when isolating Reactor Building Ventilation caused by the isolation valve closing sequence; and, at 1708 while restoring Reactor Building 'A' Ventilation caused by the Refuel Floor Exhaust fan 'A' discharge damper 66AOD-106A going partially closed with concurrent failure of the associated fan discharge damper position indicating switch 66PNS-106A1. This resulted in obstructing exhaust flow from the Reactor Building. Each condition existed for approximately a minute.

When Secondary Containment did not meet the Technical Specification Surveillance Requirement 3.6.4.1.1 for differential pressure the Limiting Condition of Operation (LCO) was not met. Therefore, Secondary Containment was Inoperable. Restoration of the LCO was completed within the allowed action completion time. This report is being submitted per 10 CFR 50.73(a)(2)(v)(C) as a condition that could have prevented the fulfillment of safety function to control the release of radioactive material.

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NARRATIVE

Background

The Secondary Containment [EIS identifier: NG] is a structure comprised of the reactor building that surrounds the primary containment and refuel equipment. Its safety function is designed to provide containment for postulated accident scenarios: loss-of-coolant accident and refueling accident. This structure forms a control volume that serves to hold up and dilute the fission products. Since pressure may increase in Secondary Containment relative to the environmental pressure, it was designed to include a differential pressure vacuum such that external atmosphere would leak into containment rather than fission products leak out.

The systems which maintain a differential pressure vacuum inside Secondary Containment include the normal Reactor Building Ventilation (RBV) system [VA] and the safety-related Standby Gas Treatment (SBGT) system [BH]. The RBV has two sets of exhaust fans. The 'A' set includes 66FN-12A with damper 66AOD-104A and 66FN-13A with damper 66AOD-106A. During a postulated accident scenario the normal RBV isolates by closing two intake isolation valves (66AOV-100A and 66AOV-100B) and two exhaust isolation valves (66AOV-101A and 66AOV-101B). At the same time SBGT initiates in order to filter gas from Secondary Containment to the environment. SBGT has the capacity to maintain the differential pressure vacuum.

During normal operation, the RBV operates with one of two exhaust fans from the refuel floor in service. Downstream of this exhaust fan is a damper consisting of two interconnected damper sections that are represented by a single designation; 66AOD-106A. Each damper section has an air operator; upper 66AOD-106A1(OP) and lower 66AOD-106A2(OP). Both air operators must function or 66AOD-106A will not open fully.

A solenoid valve controls the position of 66AOD-106A. When the control circuit for 66AOD-106A receives an open signal, the solenoid valve allows compressed air into the air cylinder of 66AOD-106A1(OP) and 66AOD-106A2(OP); air pressure overcomes internal spring pressure to open 66AOD-106A. When the solenoid valve gets a signal to close, the solenoid valve releases the air from the air cylinders of 66AOD-106A1(OP) and 66AOD-106A2(OP), allowing the damper to close by force of the internal spring.

66FN-13A is interlocked with 66AOD-106A such that the fan starts only after the damper is full-open. If the damper does not open within a certain time limit, the timer interlock closes the damper. If the damper comes off its open seat (not full-open) then the fan stops and the standby fan receives a start signal.

Damper 66AOD-106A position is provided by two position switches. 66PNS-106A1 is used to determine whether or not the damper is full-open and, 66PNS-106A2 for full-closed. Only 66PNS-106A1 provides the permissive signal for 66FN-13A to start and continue to run. When the Reactor Building is isolated, power is removed from the solenoid valve; this removes air pressure from the damper operators for 66AOD-106A. Once air pressure is removed, spring pressure will force the air operator in the closed direction and thus close the damper. If the damper is not full-open then the position switch 66PNS-106A1 provides a signal to secure the associated fan 66FN-13A.

Either 66FN-13A or 66FN-13B can be in service, with the other fan available in standby to start upon the operating fan tripping.

This Licensee Event Report (LER) addresses a malfunction with the 'A' refuel floor damper full-open position switch 66PNS-106A1 concurrent with upper air operator 66AOD-106A1(OP) diaphragm failure.

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Event Description

At 1655 on October 28, 2014, James A. FitzPatrick Nuclear Power Plant (JAF) was operating at 100 percent power when the RBV was placed in isolate mode and SBGT was initiated. The differential pressure decreased below 0.25 inches water vacuum. At 1708, RBV was being returned to its normal non-isolated line-up with the 'A' RBV train in service following planned maintenance. When SBGT was secured and 'A' RBV was operating by itself, the reactor building differential pressure dropped below 0.25 inches water vacuum again. The 'B' RBV train was placed in service and the Secondary Containment differential pressure returned to 0.25 inches water vacuum. The period of time that the differential pressure was below 0.25 inches water vacuum in both cases was approximately one minute.

During the period in which Secondary Containment did not meet the Technical Specification (TS) Surveillance Requirement (SR) 3.6.4.1.1 for differential pressure, the Limiting Condition of Operation (LCO) allowed by the TS was not met. Therefore, Secondary Containment was Inoperable. Restoration of the LCO was completed within the allowed action completion time of the TS. An NRC notification was made by ENS 50579. This Licensing Event Report (LER) is being submitted per 10 CFR 50.73(a)(2)(v)(C) as a condition that could have prevented the fulfillment of safety function to control the release of radioactive material.

Event Analysis

Isolation sequence: The time it takes for the exhaust isolation valves to close is 5 seconds while the intake isolations valves close in 15 seconds during a RBV isolation sequence. During this time period, air would enter Secondary Containment without air being removed. As a result, the differential pressure decreases.

Damper misalignment: Previously, on August 28, 2014, the damper 66AOD-106A was found not full open with the fan running. Tracking items to investigate and correct were initiated in the work management system. Repairs had not been performed prior to the event reported by this LER.

At 1708 on October 28, the RBV 'A' train did not maintain Secondary Containment differential pressure above 0.25 inches water vacuum because the damper 66AOD-106A did not fully open. The troubleshooting identified that the top operator 66AOD-106A1(OP) did not stroke because the air piston diaphragm was degraded.

Position Switch: Position switch 66PNS-106A1 detects whether 66AOD-106A is full-open. In the event that it is not full-open, the control circuitry should initiate a shutdown of RBV fan 66FN-13A and a start of 66FN-13B. During the events of this LER, the air operator failure and closing of 66AOD-106A did not stop 66FN-13A. The failure to shutdown the 'A' fan when the damper started to close resulted in 66FN-13A continuing to run without exhausting enough air to overcome the amount of air supplied by the Reactor Building Supply.

On August 6, 2014, an automatic swap of the 'A' train to the 'B' train occurred. This was evident when an Operator observed the 66FN-13B exhaust fan running with its control switch Green-flagged and 66FN-13A fan not running with its control switch Red-flagged. The flagged indication represents the manual operation of the fan where Red means running and Green means off. Therefore, at some point after 'A' was manually set to run, it had tripped and the 'B' train initiated to cover the RBV exhaust load. A change in the running exhaust fan does not cause a control room alarm. The same event happened again on August 17, 2014. On August 19, 2014, troubleshooting involved replacing a portion of the switch assembly for 66PNS-106A1.

Cause

The cause of this event was inadequate position switch setup of 66PNS-106A1 during corrective maintenance that was performed in August 2014. Without the proper position switch setting, the Reactor Building Ventilation damper operator 66AOD-106A1(OP) diaphragm failure and subsequent failure of 66AOD-106A to remain full-open was not automatically detected such that the alternative exhaust fan could be initiated and Secondary Containment differential pressure maintained. Also, the difference in closure time between intake and exhaust isolation valves caused differential pressure to decrease below 0.25 inches water vacuum.

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Similar Events

The diaphragm failure of the upper air operator 66AOD-106A1(OP) is the same type of failure which later occurred in the lower air operator 66AOD-106A2(OP). The lower operator failure caused the September 18, 2015, Secondary Containment pressure transient, reported in LER-2015-005 by letter dated November 17, 2015, JAFP-15-0131. However, in both cases, the position switch 66PNS-106A1 did not function to swap ventilation exhaust fans.

External events:

Cooper Nuclear Station: LER 2014-001, Secondary Containment Declared Inoperable due to Rise in Differential Pressure when Operator inadvertently closed exhaust damper (ML14070A363).

Columbia Generating Station: LER 2013-007-01, Secondary Containment Pressure Exceeded During Severe Weather Conditions (ML14160B127).

Columbia Generating Station: LER 2014-001-01, Secondary Containment Pressure (ML14161A144).

FAILED COMPONENT IDENTIFICATION:

Position Switch Manufacturer:	Honeywell	Damper Operator Manufacturer:	Honeywell
Manufacturer Model Number:	LSP6B	Manufacturer Model Number:	MP904B
NPRDS Manufacturer Code:	H260	NPRDS Manufacturer Code:	H260
NPRDS Component Code:	ZIS	NPRDS Component Code:	CDMP
FitzPatrick Component ID:	66PNS-106A1	FitzPatrick Component ID:	66AOD-106A1(OP)

Corrective Actions

Completed Actions

- Revise ST-40D, Daily Surveillances. Improve procedure definition for applicability of SR.
- Repair Refuel Floor Exhaust Fan 'A' Discharge isolation damper top blade operator 66AOD-106A1(OP)
- Replaced and adjusted 66PNS-106A1

Future Actions

- The pressure transients caused by RBV isolation sequence has been entered into the Corrective Action Process

Safety Significance

Nuclear safety

This event did not have any actual or potential impact on nuclear safety.

Radiological safety

There was no radiological consequence during this event.

The potential for a radiological consequence is only applicable during the time that Secondary Containment was below 0.25 inches water vacuum differential pressure. When this condition had occurred at JAF it was momentary excursions.

Secondary Containment maintains a differential pressure vacuum by two of four RBV exhaust fans or one of two SGBT trains. During a postulated accident scenario RBV is placed in isolation and the SGBT is used to maintain differential pressure. During this event, one of four RBV exhaust fans were affected. The condition does not adversely impact that ability of RBV to isolate or SGBT to initiate. Therefore, the capability of Secondary Containment to mitigate the consequence of an accident is unaffected by this deficiency.

Industrial safety

This event did not have any actual or potential impact on industrial safety.

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References

- Condition Report: CR-JAF-2014-04535, August 28, 2014, damper failure
- Condition Report: CR-JAF-2014-06498, October 28, 2014, Cause Evaluation
- Condition Report: CR-JAF-2014-07227, RBV pressure transient
- Condition Report: CR-JAF-2015-04166, September 18, 2015, Cause Evaluation