



James A. FitzPatrick NPP
P.O. Box 110
Lycoming, NY 13093

Alexander Sterio
Site Vice President– JAF

JAFP-24-0039
August 21, 2024

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: 2024-001-01, EDG Lube Oil Check Valve Bonnet Cap Leak due to Failed Gasket

Dear Sir or Madam:

This report is being submitted pursuant to 10 CFR 50.73(a)(2)(i)(B) and 10 CFR 50.73(a)(2)(v)(A).

There are no new regulatory commitments contained in this report.

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

Sincerely,

A handwritten signature in black ink, appearing to read "Alexander Sterio".

Alexander Sterio
Site Vice President

ADS/MH

Enclosure: LER: 2024-001-01, EDG Lube Oil Check Valve Bonnet Cap Leak due to Failed Gasket

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



LICENSEE EVENT REPORT (LER)

(See Page 2 for required number of digits/characters for each block)

(See NUREG-1022, R.3 for instruction and guidance for completing this form
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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, Library, and Information Collections Branch (T-6 A10M), U. S. Nuclear Regulatory Commission, Washington, DC 20555-0001, or by email to Infocollections.Resource@nrc.gov, and the OMB reviewer at: OMB Office of Information and Regulatory Affairs, (3150-0104), Attn: Desk Officer for the Nuclear Regulatory Commission, 725 17th Street NW, Washington, DC 20503; email: oir_submission@omb.eop.gov. The NRC may not conduct or sponsor, and a person is not required to respond to, a collection of information unless the document requesting or requiring the collection displays a currently valid OMB control number.

1. Facility Name

James A. FitzPatrick Nuclear Power Plant

050
 052

2. Docket Number
05000333

3. Page
1 OF 4

4. Title

EDG Lube Oil Check Valve Bonnet Cap Leak due to Failed Gasket

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
04	24	2024	2024	001	01	08	21	2024	N/A	N/A
									N/A	N/A

9. Operating Mode

1

10. Power Level

100

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)	10 CFR Part 50	50.73(a)(2)(ii)(A)	50.73(a)(2)(viii)(A)	73.1200(a)
<input type="checkbox"/> 20.2201(b)	<input type="checkbox"/> 20.2203(a)(3)(i)	<input type="checkbox"/> 50.36(c)(1)(i)(A)	<input type="checkbox"/> 50.73(a)(2)(ii)(B)	<input type="checkbox"/> 50.73(a)(2)(viii)(B)	<input type="checkbox"/> 73.1200(b)
<input type="checkbox"/> 20.2201(d)	<input type="checkbox"/> 20.2203(a)(3)(ii)	<input type="checkbox"/> 50.36(c)(1)(ii)(A)	<input type="checkbox"/> 50.73(a)(2)(iii)	<input type="checkbox"/> 50.73(a)(2)(ix)(A)	<input type="checkbox"/> 73.1200(c)
<input type="checkbox"/> 20.2203(a)(1)	<input type="checkbox"/> 20.2203(a)(4)	<input type="checkbox"/> 50.36(c)(2)	<input type="checkbox"/> 50.73(a)(2)(iv)(A)	<input type="checkbox"/> 50.73(a)(2)(x)	<input type="checkbox"/> 73.1200(d)
<input type="checkbox"/> 20.2203(a)(2)(i)	10 CFR Part 21	<input type="checkbox"/> 50.46(a)(3)(ii)	<input checked="" type="checkbox"/> 50.73(a)(2)(v)(A)	10 CFR Part 73	<input type="checkbox"/> 73.1200(e)
<input type="checkbox"/> 20.2203(a)(2)(ii)	<input type="checkbox"/> 21.2(c)	<input type="checkbox"/> 50.69(g)	<input type="checkbox"/> 50.73(a)(2)(v)(B)	<input type="checkbox"/> 73.77(a)(1)	<input type="checkbox"/> 73.1200(f)
<input type="checkbox"/> 20.2203(a)(2)(iii)		<input type="checkbox"/> 50.73(a)(2)(i)(A)	<input type="checkbox"/> 50.73(a)(2)(v)(C)	<input type="checkbox"/> 73.77(a)(2)(i)	<input type="checkbox"/> 73.1200(g)
<input type="checkbox"/> 20.2203(a)(2)(iv)		<input checked="" type="checkbox"/> 50.73(a)(2)(i)(B)	<input type="checkbox"/> 50.73(a)(2)(v)(D)	<input type="checkbox"/> 73.77(a)(2)(ii)	<input type="checkbox"/> 73.1200(h)
<input type="checkbox"/> 20.2203(a)(2)(v)		<input type="checkbox"/> 50.73(a)(2)(i)(C)	<input type="checkbox"/> 50.73(a)(2)(vii)		

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

12. Licensee Contact for this LER

Licensee Contact

Mr. Mark Hawes, Regulatory Assurance

Telephone Number (Include Area Code)

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
A	LA	V	J036	Y					

14. Supplemental Report Expected

No Yes (If yes, complete 15. Expected Submission date)

15. Expected Submission Date

Month Day Year

16. Abstract (Limit to 1326 spaces, i.e., approximately 13 single-spaced typewritten lines)

On April 24, 2024, at 1948, with James A. FitzPatrick Nuclear Power Plant at 100% power, the "B" Emergency Diesel Generator (EDG) was being operated for surveillance testing when lube oil leaked from the bonnet cap of check valve 93EDG-57B. The leak originated when a gasket between the body-to-bonnet connection failed. The gasket was installed on October 11, 2023. The cause of the gasket failure was uneven compression during installation when the bonnet cap was over tightened and yielded the thread root. Work planning instruction and the technical evaluation did not identify a change to the metal-to-metal tightening standard when installing a gasket as a corrective action on October 11, 2023.

This deficiency would have prevented the fulfillment of the "B" EDG subsystem safety function due to not meeting the lube oil inventory requirement. The other 3 EDG units were not affected by this deficiency, no gaskets were installed.

This condition was prohibited by Technical Specifications (TS), which is reportable per 10 CFR 50.73(a)(2)(i)(B). In addition, during this period, when "A" EDG subsystem was inoperable for planned maintenance, both subsystems were inoperable, a condition reportable per 10 CFR 50.73(a)(2)(v)(A). The condition was corrected by replacing the check valve on April 25, 2024. A case study will be developed and shared.



**LICENSEE EVENT REPORT (LER)
CONTINUATION SHEET**

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1. FACILITY NAME James A. FitzPatrick Nuclear Power Plant	<input checked="" type="checkbox"/> 050	2. DOCKET NUMBER 05000333	3. LER NUMBER		
	<input type="checkbox"/> 052		YEAR 2024	SEQUENTIAL NUMBER - 001	REV NO. - 01

NARRATIVE

Background

The Emergency Onsite Power Supply System [EISS identifier: EK] consists of two redundant Emergency Diesel Generator (EDG) subsystems. Each EDG subsystem consists of two EDG units. The capability of the two units in the subsystem to start, force parallel, and attain rated voltage and frequency together within 10 seconds, and run the necessary engineered safeguard loads, meets the requirements for the Emergency AC Power System.

The EDG lubrication system [LA] is designed to provide sufficient lubrication (lube oil) to permit proper operation by circulating the lube oil to the diesel engine working surfaces and to remove excess heat generated by friction during operation. The lube oil inventory volume required to ensure 7 days continuous operation is 168 gallons based on the manufacturer's consumption values and without reaching the recommended minimum level.

In standby, the system circulates warmed oil through the EDG engines to promote successful quick starts. This is accomplished by a 5/8-inch line with a swing check valve (93EDG-57B for "B" EDG unit), which closes during EDG operation to prevent bypassing flow. The check valve has a bonnet cap to access internals for preventive maintenance.

Event Description

On April 24, 2024, with James A. FitzPatrick Nuclear Power Plant (JAF) at 100% power, a surveillance test was started at 1912, involving an operational test of the "B" EDG subsystem. Operators were monitoring the performance when they discovered lube oil spraying from the top of check valve 93EDG-57B. At 1948, the "B" EDG unit was declared inoperable. Operators secured the EDG as well as the circulating and turbocharger lube oil pumps. The leak originated from the bonnet cap.

With the engine in standby, the leak rate was approximately 60 drops per minute (dpm). A leak rate could not be observed with the system pressurized during the event; however, it was estimated that 11.5 gallons of lube oil was lost due to the leak. The operations staff estimated that the engine was running for approximately 5 minutes with the leak before the engine was secured. Therefore, the leak rate was approximately 2.3 gallons per minute (gpm), or 138 gallons per hour (gph). The magnitude of the lube oil leak would have exhausted the lube oil supply and this deficiency would have prevented the function of "B" EDG unit to fulfill its mission time.

The A, C, and D check valves did not have any similar leaking condition. The "A" EDG subsystem remained Operable and the "D" EDG unit remained available during this event.

The check valve 93EDG-57B was replaced on April 25 by 1300. There was no leakage following the repair. The Post Maintenance Testing was completed satisfactory restoring the "B" EDG subsystem to Operable.



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Event Analysis

On October 11, 2023, a planned preventive maintenance task was performed to open the bonnet cap and inspect the check valve internals, per industry Operating Experience. During post maintenance testing, with "B" EDG operating, an oil leak was identified. A temporary repair to install a gasket and use thread sealant was evaluated and installed to prevent oil leakage.

The failed check valve 93EDG-57B was sent to a laboratory for investigation. Examination revealed uneven compression of the gasket and a crack in the thread root. A gasket installed in the bonnet cap showed damage and delamination.

Normal installation is bonnet cap to body metal to metal contact to tightness standard, with no visible gaps. Adding a gasket to the joint would make that abrupt torque spike less likely to detect. With no guidance on how much to tighten the gasketed joint and no guidance on a specific torque for the gasketed joint, the bonnet cap was tightened until the leak was stopped. The installation of this gasket also resulted in less thread engagement and would require more tightening to compress the gasket to ensure a sealed pressure boundary. The bonnet cap would be tightened enough to stop the leak to fulfill the role of the temporary leak repair. This continued tightening, yielded the bonnet thread root which led to an uneven compression on the gasket which led to the eventual gasket failure.

This deficiency existed between when the repair was performed on October 11, 2023, and when the check valve was restored to operable on April 25, 2024. During this period, the gasket repair maintained operating lube oil system pressure temporarily, but it would not be expected to perform its function through the EDG mission time. The required lube oil inventory of 7 days required per Technical Specification (TS) surveillance requirement (SR) 3.8.3.2 would not be met based on the increased rate of consumption cause by this oil leak. This deficiency renders the "B" EDG subsystem inoperable. The allowed restoration time required by TS 3.8.1 for one inoperable EDG subsystem would be exceeded. This event is being reported as a condition prohibited by TS in accordance with 10 CFR 50.73(a)(2)(i)(B). During this period, when "A" EDG subsystem was inoperable due to testing, both subsystems were inoperable, and these events are reportable per 10 CFR 50.73(a)(2)(v)(A).

Cause

The lube oil leak from check valve 93EDG-57B was caused by a failed gasket installed on the bonnet connection. Over tightening of the bonnet cap with the gasket installed yielded the thread root and caused uneven compression of the gasket which led to the failed gasket.

First contributing cause was work instructions to install a gasket leak repair did not provide adequate detail regarding how to tighten the bonnet cap. This is a standard practice for brass fittings; however, it does not apply to joints modified to use a gasket. If a specified torque value was identified in the work instructions than the over tightening of the bonnet cap would have been prevented.

Second contributing cause was insufficient technical rigor for installation of the gasket for use in this temporary corrective maintenance.



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Similar Events

No previous similar events.

FAILED COMPONENT IDENTIFICATION:

Manufacturer:	Jenkins Brothers
Manufacturer Model Number:	92-A
Manufacturer Code:	J036
Component Code:	V
FitzPatrick Component ID:	93EDG-57B

Corrective Actions

Completed Actions

On April 25, 2024, check valve 93EDG-57B was replaced and the “B” EDG subsystem restored to Operable.

Planned Actions

Create and Present Teaching and Learning Case Study of the event and cause identified to Engineering, Maintenance, and Supervisors and above. Case study to include technical rigor of Engineering products and work packages.

Safety Significance

Nuclear safety – **There were no actual nuclear consequences.**

From October 11, 2023, until the failure of the gasket on April 24, 2024, there were 9 successful surveillance tests performed (approximately 11 hours total loaded on the electrical bus). The gasket repair would have held pressure and EDG would operate until the gasket failure; therefore, both EDGs units in the “B” EDG subsystem would have started and automatically powered the emergency bus. Operators could have responded to a “B” EDG unit lube oil leak by securing it, but during a Loss of Coolant Accident (LOCA) event the low lube oil pressure trip signal is bypassed so “B” EDG unit would not automatically trip until it failed.

The “D” EDG unit, in the “B” EDG subsystem, remained available to supply power to the emergency bus.

References

Issue Report – IR 04708722, Oil Leak Identified at 93EDG-57B, dated October 11, 2023

Issue Report – IR 04769343, 93EDG-57B (lube oil gallery check valve) Failure, dated April 25, 2024

Engineering Change – EC 639982, Install Gasket to Seal Bonnet Cap Leak on 93EDG-57B Check Valve, dated October 13, 2024