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February 13, 2006  
JAFP-06-0034

T.A. Sullivan  
Site Vice President - JAF

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

Subject: **Docket No. 50-333**  
**LICENSEE EVENT REPORT: LER-05-006 (CR-JAF-2005-05289)**

**Inoperable 115 kV Line in Excess of Technical Specification Allowed  
Out of Service Time**

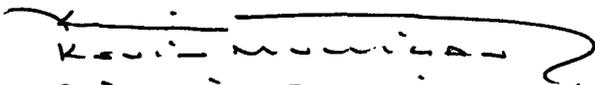
Dear Sir:

This report is submitted in accordance with 10 CFR 50.73(a)(2)(i)(B), "Any operation or condition which was prohibited by the plant's Technical Specifications."

There are no commitments contained in this report.

Questions concerning this report may be addressed to Mr. Jim Costedio at (315) 349-6358.

Very truly yours,

  
T.A. Sullivan  
Site Vice President (JAF-114)

T. A. Sullivan

TAS:DD:dd  
Enclosure

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

IE22

Estimated burden per response to comply with this mandatory information collection request: 50 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 F52), U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, or by internet e-mail to infocollects@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 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.

**LICENSEE EVENT REPORT (LER)**

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

1. FACILITY NAME James A. FitzPatrick Nuclear Power Plant	2. DOCKET NUMBER 05000333	3. PAGE 1 OF 5
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4. TITLE  
Inoperable 115 kV Line in Excess of Technical Specification Allowed Out of Service Time

5. EVENT DATE			6. LER NUMBER			7. REPORT DATE			8. OTHER FACILITIES INVOLVED	
MONTH	DAY	YEAR	YEAR	SEQUENTIAL NUMBER	REV NO	MO	DAY	YEAR	FACILITY NAME	DOCKET NUMBER
12	19	05	05	006	00	02	13	06	Nine Mile Point Unit 1	05000220
									FACILITY NAME	DOCKET NUMBER
									N/A	05000

9. OPERATING MODE 1	11. THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check all that apply)			
	20.2201(b)	20.2203(a)(3)(ii)	50.73(a)(2)(ii)(B)	50.73(a)(2)(ix)(A)
10. POWER LEVEL 100	20.2201(d)	20.2203(a)(4)	50.73(a)(2)(iii)	50.73(a)(2)(x)
	20.2203(a)(1)	50.36(c)(1)(i)(A)	50.73(a)(2)(iv)(A)	73.71(a)(4)
	20.2203(a)(2)(i)	50.36(c)(1)(ii)(A)	50.73(a)(2)(v)(A)	73.71(a)(5)
	20.2203(a)(2)(ii)	50.36(c)(2)	50.73(a)(2)(v)(B)	OTHER Specify in Abstract below or in NRC Form 366A
	20.2203(a)(2)(iii)	50.46(a)(3)(ii)	50.73(a)(2)(v)(C)	
	20.2203(a)(2)(iv)	50.73(a)(2)(i)(A)	50.73(a)(2)(v)(D)	
	20.2203(a)(2)(v)	X 50.73(a)(2)(i)(B)	50.73(a)(2)(vii)	
	20.2203(a)(2)(vi)	50.73(a)(2)(i)(C)	50.73(a)(2)(viii)(A)	
	20.2203(a)(3)(i)	50.73(a)(2)(ii)(A)	50.73(a)(2)(viii)(B)	

12. LICENSEE CONTACT FOR THIS LER

NAME Mr. Darren Deretz, Sr. Regulatory Compliance Specialist	TELEPHONE NUMBER (Include Area Code) (315) 349-6851
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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
D	FK	CON	P145	N					

14. SUPPLEMENTAL REPORT EXPECTED				15. EXPECTED SUBMISSION DATE		
YES (If yes, complete EXPECTED SUBMISSION DATE)	X	NO		MONTH	DAY	YEAR

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

On December 19, 2005, with the James A. FitzPatrick Nuclear Power Plant (JAF) operating at 100 percent power, National Grid (local grid operator) notified the Nine Mile Point Nuclear Station, Unit 1 (NMP1) Control Room that abnormal amperage readings on the 115 kV off-site power lines were noted and may be indicative of an open phase. JAF was contacted by NMP1 regarding the abnormal readings. JAF Operators walked down the 115 kV switchyard and observed an open circuit on the "A" phase of 115 kV Line #4, caused by a broken bus bar connector. Line #4 was declared inoperable and removed from service for repairs. The bus bar connector was promptly repaired and Line #4 was returned to service on December 20, 2005.

An Engineering evaluation of the NMP1, JAF, and National Grid data indicated that the bus bar connector failure existed, undetected, since November 29, 2005, resulting in a Line #4 out of service time of approximately 21 days. This resulted in one redundant offsite power supply exceeding its Technical Specifications (TS) 3.8.1 allowed out of service time.

The cause of the undetected inoperability of Line #4 was an inadequate surveillance test (ST-9W). ST-9W records 115 kV bus voltages and confirms power availability, via communication with National Grid, but does not confirm that all three phases are intact by monitoring current flow in the 115 kV transmission lines.

As part of the corrective actions, a once per shift check of Line #4 phase amperage has been implemented to verify intact 115 kV phases and flow of electricity through the JAF switchyard. This criteria will be added to ST-9W.

There were no nuclear, radiological or safety consequences associated with this event.

**LICENSEE EVENT REPORT (LER)**  
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James A. FitzPatrick Nuclear Power Plant	05000333	05	006	00			

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

EIS Codes in [ ]

**Background:**

The James A. FitzPatrick Nuclear Power Plant (JAF) 115 kV switchyard [FK] is supplied by two independent 115 kV transmission lines and associated breakers, providing two redundant sources of offsite power. One transmission line, the Lighthouse Hill – FitzPatrick Line #3, connects the South 115 kV bus to the Lighthouse Hill substation. The other transmission line, Nine Mile – FitzPatrick Line #4, connects the North 115 kV bus to the Nine Mile Point Nuclear Station, Unit 1 (NMP1) 115 kV switchyard which is then connected to the South Oswego substation.

Each 115 kV transmission line normally supplies power to the two reserve station service transformers (RSSTs) T2 and T3, through a normally closed bus disconnect. The 115 kV transmission system is designed such that either line alone will supply both RSSTs that supply both safeguards buses. The RSSTs do not supply plant loads during normal operation. During normal operation, the normal station service transformer T4 supplies all plant loads, while reserve transformers T2 and T3, although energized at the 115 kV level, are disconnected from the 4.16 kV plant buses.

Voltage conditions on both 115 kV transmission lines are monitored in the JAF Control Room using voltmeters. There is no definitive 115 kV phase current flow (amperage) indication instrumentation in the JAF Control Room. An undervoltage condition on either 115 kV line will alarm in the Control Room. If a fault were to occur on either line, the plant would remain stable and the redundant 115 kV line will not be prevented from performing its function.

**Event Description:**

On December 19, 2005, with JAF operating at 100 percent power, National Grid (local grid operator) notified the NMP1 Control Room that abnormal amperage readings (0 amps on "A" phase and 50 amps on "B" and "C" phases) were noted on the 115 kV off-site power lines and suggested that the readings may indicate an open phase. The JAF Control Room was contacted by the NMP1 Control Room regarding the abnormal readings. JAF Operators walked down the 115 kV switchyard and observed an open circuit on the "A" phase of Line #4, caused by a broken bus bar connector. Line #4 was declared inoperable and removed from service for repairs. The bus bar connector was promptly repaired and Line #4 was returned to service at approximately 1511 hours on December 20, 2005.

Subsequent to this event, an Engineering evaluation of the NMP1, JAF, and National Grid data indicated that the bus bar connector failure had existed since approximately 0951 hours on November 29, 2005, resulting in an out of service (OOS) duration of approximately 21 days. Walkdowns of the JAF switchyard concluded that no other similar failures were evident.

The failure was not identified by any alarm at NMP1, JAF, or National Grid installations. There is no definitive 115 kV phase amperage indication instrumentation in the JAF Control Room. The NMP1 Control Room does have 115 kV phase amperage indication but the anomalous indication was not noted. Because of the design of the off-site power systems supplying JAF and NMP1, there was no interruption of voltage to either station and no alarms in either Control Room to alert Operators of the abnormal condition.

JAF Technical Specifications (TS) Limiting Conditions for Operation (LCO) 3.8.1, "Electrical Power Systems – AC Sources – Operating," requires that two 115 kV transmission lines be Operable in Modes 1, 2 and 3. TS 3.8.1 also requires that an inoperable 115 kV transmission line be restored to Operable status within 7 days, or the plant must be placed in Mode 3 in 12 hours and Mode 4 in 36 hours. As Line #4 was inoperable for a duration in excess of the TS allowed out of service time (AOT), this report is submitted in accordance with 10 CFR 50.73(a)(2)(i)(B), "Any operation or condition which was prohibited by the plant's Technical Specifications."

There were no nuclear, radiological or safety consequences associated with this event.

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

**Cause of Event:**

The cause of the undetected inoperability of Line #4 was an ineffective monitoring plan for 115 kV Line #4. Surveillance test ST-9W, "Electrical Lineup and Power Verification", performed on a 7 day frequency, records 115 kV bus voltages and requires JAF to contact National Grid to confirm power is available from Line #3 and Line #4. However, it does not contain sufficient detail to verify current is flowing in all 3 phases. [Cause Code D]

The broken bus bar connector was promptly weld repaired to restore Line #4 and consequently could not be sent out for failure analysis. The apparent mechanistic failure mode is mechanical overload. It is postulated that mishandling during previous maintenance activities caused a stress riser at the rigid connection of the bus bar connector. The addition of winter weather conditions (wind induced vibration, temperature cycling, ice loading) acting on the stress riser caused the bus bar connector to fail. The applicable maintenance procedure, MP-071.61, "115 kV Oil Circuit Breaker Maintenance", contains no cautions or special instructions for handling or proper removal and/or disconnecting the bus bar from the breaker during maintenance. [Cause Code D]

**Event Analysis:**

There were no nuclear, radiological or safety consequences associated with this event.

The function of the 115 kV transmission system is to provide an independent offsite power supply to safety related components. The two redundant 115 kV lines are part of the qualified off-site circuits and are required to provide power to both reserve transformers and their safety loads.

A probabilistic risk assessment (PRA) determined that, with conservative assumptions regarding concurrent maintenance activities and regarding the capability of the remaining 115 kV transmission line (Line #3), the resultant conditional core damage probability (CCDP) was determined to be below the risk significance threshold of 1.0E-06. As the CCDP was determined to be below the risk significance threshold, the safety significance of this event was minimal. All required safety functions were maintained.

**Extent of Condition:**

The type of bus bar connector that failed is also installed in eleven other locations on the 115 kV transmission system. A visual inspection was performed on all eleven of these bus bar connectors. No abnormalities were found. The 345 kV lines do not have the same type of bus bar connector but instead have a connector that precludes the potential for mechanical damage during normal maintenance activities.

Monitoring phase amperage at Line #4 (using NMP1 instrumentation) also provides phase amperage monitoring for Line #3, because Line #4 is normally connected with Line #3. However, when Line #4 is taken OOS, Line #3 phase amperage cannot be monitored from the NMP1 Line #4 monitoring location. National Grid has instrumentation to monitor phase amperage of both Line #3 and Line #4. JAF will revise the applicable surveillance tests to utilize National Grid's phase amperage monitoring capability.

Compensatory actions taken to verify amperage readings each shift will reduce the risk of a similar failure remaining undetected.

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**Corrective Actions:**

*Corrective Actions Completed by JAF Prior to this Report:*

1. Repaired the failed bus bar connector.
2. Performed a visual inspection of other similar connectors on both 115 kV transmission lines.
3. Revised Operations Shift Standing Order (OSSO) 05-001 to include a once per shift check of NMP1 Line #4 phase amperage to verify intact 115 kV phases and flow of electricity through the JAF switchyard.
4. Completed Cause Evaluations for this event.
5. Reviewed National Grid's monitoring of JAF's 115 kV transmission lines. Confirmed that National Grid has instrumentation to monitor phase amperage of both Line #3 and Line #4. Created corrective actions to revise applicable surveillance tests to utilize this monitoring.

*Corrective Actions not yet Completed:*

1. Revise surveillance test ST-9W, "Electrical Lineup and Power Verification", to include the current criteria from OSSO 05-001.  
*(Due 03/01/2006)*
2. Revise ST-9W, "Electrical Lineup and Power Verification" and ST-9R, "EDG System Quick-Start Operability Test and Offsite Circuit Verification," to require confirmation (via National Grid) that the 115 kV line phases are intact by monitoring the line current (amperage).  
*(Due 03/01/2006)*
3. Revise MP-071.61, "115 kV Oil Circuit Breaker Maintenance", to reduce the potential for creating a stress riser at the rigid end of the bus bar connector.  
*(Due 03/10/2006)*
4. Perform a detailed inspection and evaluation of the eleven other bus bar connectors on Line #3 and Line #4 at the next available time to determine reliability and any potential need for additional repair or replacement. A bus and transformer outage is required for each line to perform these evaluations.  
*(Due 10/31/2006)*

**Safety System Functional Failure Review:**

A review of this event determined that a safety system functional failure as defined by NEI 99-02, Revision 3, did not occur.

**Similar Events:**

1. LER-05-001, "Inoperable Offsite Circuit in Excess of Technical Specifications Allowed Out of Service Time", dated March 31, 2005.  
  
The cause of this event was due to a misinterpretation of the JAF TS. As a result of this misinterpretation, JAF did not correctly declare the applicable offsite power source inoperable in accordance with TS. Corrective actions from LER-05-001 would not be expected to prevent the event discussed in LER-05-006.

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

**Failed Component Identification:**

Manufacturer: Penn Union  
Model Number: Model # WLAC-20-E  
NPRDS Manufacturer Code: P145  
NPRDS Component Code: Connector  
FitzPatrick Component ID: 071BRK-10012 (Line #4) Bus Bar Connector

**References:**

1. Apparent Cause Evaluation (ACE), JAF Condition Report CR-JAF-2005-05180, Failure of bus connector on load side of the "A" phase of 071-DSC-10011, dated 1/11/2006.
2. Apparent Cause Evaluation (ACE), JAF Condition Report CR-JAF-2005-05289, Failure of bus connector on load side of the "A" phase of 071-DSC-10011, Determination of why deviation was not discovered more promptly, dated 1/30/2006.