



Entergy Nuclear Northeast  
Entergy Nuclear Operations, Inc.

James A. Fitzpatrick NPP  
P.O. Box 110  
Lycoming, NY 13093  
Tel 315-349-6024 Fax 315-349-6480

**Lawrence M. Coyle**  
Site Vice President – JAF

JAFP-13-0158  
December 26, 2013

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

Subject: LER: 2013-003, Unfused DC Ammeter Circuits Result in Unanalyzed Condition  
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)(ii)(B), as a condition that resulted in the plant being in an unanalyzed condition that significantly degraded plant safety.

There are no commitments contained in this report.

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

Sincerely,

*Chris M Adner by direction of Lawrence M. Coyle*

Lawrence M. Coyle  
Site Vice President

LMC/CMA/ds

Enclosure(s): JAF LER 2013-003, Unfused DC Ammeter Circuits Result in Unanalyzed Condition

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.

<b>1. FACILITY NAME</b> James A. FitzPatrick Nuclear Power Plant	<b>2. DOCKET NUMBER</b> 05000333	<b>3. PAGE</b> 1 OF 3
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**4. TITLE**  
Unfused DC Ammeter Circuits Result in Unanalyzed Condition

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	31	13	2013	- 003 -	00	12	26	13	N/A	N/A
									FACILITY NAME	DOCKET NUMBER
									N/A	N/A

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

12. LICENSEE CONTACT FOR THIS LER	
FACILITY NAME Mr. Chris M. Adner, Manager, Regulatory Assurance	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

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

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

During James A. Fitzpatrick's (JAF) review of Operating Experience INPO ICES-305419, JAF identified a similar condition. The station's review determined that the plant wiring design for the station battery ammeter circuits contains a shunt in the current flow from each direct current (DC) battery, with leads to an ammeter in the main control room (MCR). The ammeter wiring attached to the shunt does not have fuses, and if one of the ammeter wires shorts to ground during a fire at the same time another DC wire from the opposite polarity on the same battery also shorts to ground (as a result of the fire), a ground loop through the unfused ammeter cable could occur. With enough current going through the cable, the potential exists that the overloaded ammeter wiring could damage safe shutdown wiring in direct physical contact with the cable resulting in a loss of the associated safe shutdown function/capability or a secondary fire in another fire area.

The cause of this condition is the original design criteria not specifying protection for shunt fed ammeter circuits. The condition is being tracked by the corrective action process; an analysis is underway to determine the appropriate resolution.

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

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**NARRATIVE**

**Background**

Preceding events

Unit: 1                                      Event Date: 10/31/2013                                      Event Time: 17:22 EST  
 Mode: 1                                      Mode Name: Power Operation                                      Reactor Power: 100 percent

**EVENT DESCRIPTION**

During James A. Fitzpatrick's (JAF) review of OE INPO ICES-305419, JAF identified a similar condition. The station's review determined that the plant wiring design for the station batteries (71SB-1 and 71SB-2) [EIS Identifier: BTRY] ammeter [II] circuits contains a shunt in the current flow from each direct current (DC) battery, with leads to an ammeter in the main control room (MCR). The small difference in voltage between the two taps on the shunt is enough to deflect the ammeter in the MCR when current flows from the battery through the shunt. The ammeter wiring attached to the shunt does not have fuses, and if one of the ammeter wires shorts to ground during a fire, at the same time another DC wire from the opposite polarity on the same battery also shorts to ground during the fire, a ground loop through the unfused ammeter cable could occur. With enough current going through the cable, the potential exists that the overloaded ammeter wiring could damage other wiring in direct physical contact with the cable resulting in a loss of the associated safe shutdown function/capability or a secondary fire in another fire area.

This event was reported to the NRC (ENS 49491) on October 31, 2013 per 10 CFR 50.72(b)(3)(ii)(B). The required actions of the Technical Requirement Manual for fire barrier penetrations were implemented. This report is being submitted in accordance with 10 CFR 50.73(a)(2)(ii)(B), a condition that resulted in the plant being in an unanalyzed condition that significantly degraded plant safety.

**EVENT ANALYSIS & CAUSE**

The premise for this event to occur requires two concurrent extremely low resistance (hard) grounds (i.e., one on the positive side of the battery through the ammeter circuit wiring routed to the control room and one on the negative side of the battery through a second ground on the same battery system). The ammeter circuit only contains one pole of the battery and the event requires an unrelated circuit (of opposite polarity) shorting to ground. Furthermore, this circuit must contain an overcurrent protective device not adequately rated for the ammeter wiring. The DC distribution system is floating with no established ground other than the high resistance ground provided through the ground detector [GDET]. It is designed in this manner to allow the system to withstand one hard ground (zero resistance) with no adverse effect on the operation of any equipment fed from the DC system. Since this is a very low probability event, it was likely not considered during the development of the original Appendix R analysis and related Institute of Electrical and Electronics Engineers (IEEE) standards.

**EXTENT OF CONDITION**

An extent of condition review determined that this issue applies to Divisions 1 and 2 ammeter circuit wiring. The areas with the deficient fire barriers are the DC Switchgear Room 1A and 1B, Cable Spreading Room, Relay Room and Control Room.

**FAILED COMPONENT IDENTIFICATION:**

None

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**CORRECTIVE ACTIONS**

**Completed Actions**

The required actions of the Technical Requirement Manual for fire barrier penetrations were implemented. The Operability of fire detectors on both sides of the subject penetrations was verified.

**Open Actions**

The condition is being tracked by the corrective action process; an analysis is underway to determine the appropriate resolution.

**SAFETY SIGNIFICANCE**

**Nuclear Safety**

There were no actual consequences for this event. The potential consequences of this event are that the overloaded ammeter wiring could damage other wiring in direct physical contact with the cable resulting in a loss of the associated safe shutdown function/capability or a secondary fire in another fire area.

**Radiological Safety**

No radiological impact or dose associated with this condition.

**Industrial Safety**

No safety events or abnormal increases to personnel risk.

**SIMILAR EVENTS**

A review was performed and it was determined that there are no similar historical cases at JAF.

**REFERENCES**

- October 31, 2013 - CR-JAF-2013-05546