



March 2, 2010

NG-10-0134
10 CFR 50.73

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

Duane Arnold Energy Center
Docket 50-331
License No. DPR-49

Licensee Event Report #2010-001-00

Please find attached the subject report submitted in accordance with 10 CFR 50.73. This letter makes no new commitments or changes to any existing commitments.

A handwritten signature in black ink that reads "Christopher R. Costanzo". The signature is written in a cursive, flowing style.

Christopher R. Costanzo
Vice President, Duane Arnold Energy Center
NextEra Energy Duane Arnold, LLC

cc: Administrator, Region III, USNRC
Project Manager, DAEC, USNRC
Resident Inspector, DAEC, USNRC

1E22
NRR

LICENSEE EVENT REPORT (LER)

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

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 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 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

Duane Arnold Energy Center

2. DOCKET NUMBER

05000 331

3. PAGE

1 OF 4

4. TITLE

Emergency Diesel Generator Start due to Failed Arrester in Switchyard

5. EVENT DATE			6. LER NUMBER			7. REPORT DATE			8. OTHER FACILITIES INVOLVED	
MONTH	DAY	YEAR	YEAR	SEQUENTIA L NUMBER	REV NO.	MONTH	DAY	YEAR	FACILITY NAME	DOCUMENT NUMBER
01	01	10	2010	001	0	03	02	10	FACILITY NAME	DOCUMENT NUMBER 05000
									FACILITY NAME	DOCUMENT NUMBER 05000

9. OPERATING MODE 1	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)							
10. POWER LEVEL 100%	<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 checked="" 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)	<input type="checkbox"/> VOLUNTARY LER								

12. LICENSEE CONTACT FOR THIS LER

NAME Bob Murrell, Engineering Analyst	TELEPHONE NUMBER (Include Area Code) 319-851-7900
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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

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 January 1, 2010, while operating at 100% power, the 'A' Emergency Diesel Generator (EDG) automatically started from a valid undervoltage condition, but did not load onto its respective 4160 VAC bus. The momentary undervoltage condition was caused by a momentary fault on the 161 kilovolt (kV) Vinton Line. The momentary fault was caused by a failed lightning arrester on the 161 kV line in the Duane Arnold Energy Center (DAEC) switchyard. The 'A' EDG supply breaker was not required to close onto its respective bus as it remained powered from its normal power supply during and after the undervoltage event. Offsite power remained fully operable during and following the event.

As designed, the 'A' Emergency Service Water (ESW) system automatically started. Additionally, in response to the momentary undervoltage condition, the 'B' Well Water Pump, the RWCU System, and the Spent Fuel Pooling Cooling System tripped.

The cause of this event is a lack of coordination of the EDG automatic start logic and the DAEC switchyard protective relaying.

There were no actual safety consequences and no effect on public health and safety as a result of this event.

LICENSEE EVENT REPORT (LER)
CONTINUATION SHEET

1. FACILITY NAME Duane Arnold Energy Center	2. DOCKET 05000 - 331	6. LER NUMBER			3. PAGE 2 OF 4
		YEAR 2010	SEQUENTIAL NUMBER 001	REV NO. 0	

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

I. Description of Event:

On January 1, 2010, while operating at 100% power, the 'A' Emergency Diesel Generator (EDG) automatically started from a valid undervoltage condition, but did not load onto its respective 4160 VAC bus. The momentary undervoltage condition was caused by a momentary fault on the 161 kilovolt (kV) Vinton Line. The momentary fault was caused by a failed lightning arrester on the 161 kV line in the Duane Arnold Energy Center (DAEC) switchyard. The 'A' EDG supply breaker was not required to close onto its respective bus as it remained powered from its normal power supply during and after the undervoltage event. Offsite power remained fully operable during and following the event.

As designed, the 'A' Emergency Service Water (ESW) system automatically started. Additionally, in response to the momentary undervoltage condition, the 'B' Well Water Pump, the RWCU System, and the Spent Fuel Pooling Cooling System tripped.

II. Assessment of Safety Consequences:

There were no structures, systems, or components (SSCs) that failed during this event. The automatic starting of the 'A' EDG in response to a short-duration under-voltage condition had no personnel or radiological safety significance. Since the 'A' EDG was capable of fulfilling its safety function throughout the event and offsite power remained fully operable during and following the event, there was no nuclear safety significance.

This event did not result in a Safety System Functional Failure.

Therefore, this event did not result in any radiological or nuclear concern which would impact the health and safety of the public.

III. Cause of Event:

An Apparent Cause Evaluation (ACE 2020) was completed for this event. The ACE determined that the 'A' EDG started automatically during a condition where there was no Loss of Offsite Power or Degraded Voltage condition. This occurred because the sequential loading relay for the 'A' EDG provided, as designed, a non-safety start signal when its respective essential bus, 1A3, voltage momentarily dropped below 65% of nominal. Bus voltage dropped when a lightning arrester in the switchyard failed, causing a fault which pulled 'A' phase-ground voltage on the 161kV bus down to approximately 4kV. The protective relaying cleared the fault within 4.5 cycles (0.075 seconds), well within the design performance of the switchyard protection equipment.

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CONTINUATION SHEET**

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

The sequential loading relay gave a start signal during what is considered a normal grid transient before the relaying and circuit breakers in the switchyard substation were able to remove the fault. Therefore, any fault affecting the local grid has the potential to start the EDGs.

The apparent cause of this event is a lack of coordination of the EDG automatic start logic and the DAEC switchyard protective relaying. Specifically, the EDG automatic start logic does not have a built in tolerance for grid disturbances.

A contributing factor was the failure of the lightning arrester on the 161kV Vinton line, which was most likely caused by a combination of moisture ingress while the line was previously de-energized for planned maintenance and time in service beyond its expected life.

IV. Corrective Actions:

Corrective Actions to Address Condition

All three lightning arresters on the Vinton line were replaced on 1/29/10.

Corrective Actions to Address Apparent Cause

Modifications will be made to the 'A' and 'B' standby diesel generator start logic to introduce a time delay into the non-safety bus under voltage start so that the start signal coordinates with the grid relaying. This modification is currently due 12/15/2010.

Corrective Action to Address Extent of Condition

The lightning arresters on the 161kV Fairfax and Hiawatha lines have been replaced.

V. Additional Information:

Previous Similar Occurrences:

A review of LERs over the previous 5 years revealed the following similar occurrences:

- LER 2007-004 - Severe Weather Causes Grid Disturbance Resulting In Loss of Shutdown Cooling.
- LER 2007-011 - Automatic Start of Both Emergency Diesel Generators

EIIS System and Component Codes:

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

- EK – Emergency Onsite Power System
- EB – Low Voltage Power System – Class 1E
- FK – Switchyard System

Reporting Requirements:

This event was reported under 10CFR50.72(b)(3)(iv)(A), 'Any event or condition that results in valid actuation of any of the systems listed in paragraph (b)(3)(iv)(B) of this section' due to the Auto Start of the 'A' EDG. Reference EN # 45603.