

February 17, 1995 NG-95-0506

Mr. John B. Martin Regional Administrator Region III U. S. Nuclear Regulatory Commission 801 Warrenville Road Lisle, IL 60532

> Subject: Duane Arnold Energy Center Docket No: 50-331 Op. License No: DPR-49 Licensee Event Report #95-001 File: A-118a

Gentlemen:

In accordance with 10 CFR 50.73 please find attached a copy of the subject Licensee Event Report.

Very truly yours,

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David L. Wilson Plant Superintendent - Nuclear

DLW/BK/mbm n VerVerltr.doc

 cc. Director of Nuclear Reactor Regulation Document Control Desk
U. S. Nuclear Regulatory Commission Mail Station P1-37
Washington, D. C. 20555-0001

NRC Resident Inspector - DAEC



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NRC FORM	U.S. NUCLEAR REGULATORY COMMISSION (5-92)							APPROVED BY OMB NO. 3150-0104 EXPIRES 5/31/95						
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	20.405(a)(1)(v)					50.73(a)(?)(iii)			50.73(a)(2)(x)		x)	Form 366a)		
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On January 28, 1995, with the plant operating at 100% power, both Standby Diesel Generators (SBDGs) automatically started but were not required to load.

The cause of the automatic start was a sensed momentary under-voltage condition on both essential buses which was monitored by bus under-voltage relays that feed the SBDG start logics. The sensed momentary under-voltage condition was caused by momentary grid disturbances following an ice storm.

Following verification that the essential buses were being powered from their normal source, the SBDGs were secured and returned to the standby mode.

This event had no effect on the safe operation of the plant.

NRC FORM 366A (5-92)	U.S. NUCLEAR REGULATORY COMMISSION LICENSEE EVENT REPORT (LER) TEXT CONTINUATION					APPROVED BY OME NO. 3150-0104 EXPIRES 5/31/95					
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TEXT (If more space is required, use additional copies of NRC Form 366A) (17) I. DESCRIPTION OF EVENT

> At approximately 0100 on January 28, 1995, the plant was operating at 100% power and was in day 4 of a 14 day Limiting Condition for Operation (LCO) on the High Pressure Coolant Injection (HPCI) System and in day 5 of a 30 day Administrative LCO on the "A" Control Building Chiller. The essential buses were being powered by the Startup transformer with the Standby transformer in backup (normal alignment). A recent storm in the area had caused significant ice buildup on transmission lines in the electrical transmission system.

> At 0108, two of the three phases (lines) of a 161Kv line located approximately 5.6 miles south of the Duane Arnold Energy Center (DAEC) switchyard came in contact with each other and caused a phase-to-phase fault. The lines had been set in motion (galloping condition) by the ice buildup and the prevailing winds. The fault was sensed by various protective relays and the line automatically isolated by the opening of two feeder breakers in the DAEC switchyard. The breakers automatically re-closed 2 seconds later, sensed that the fault still existed and tripped open. The duration of each fault was about 45 msec (app. 3 cycles) with a fault current of 2500 amps. A fault model showed that the voltage on the 161Kv bus in the DAEC switchyard dropped to approximately 65% of nominal voltage on two of the phases with the third staying near normal.

> The Standby Diesel Generator (SBDG) Bus under voltage relays sensed a decreased voltage on the essential buses. As designed, both SBDGs started without sequencing to the buses. Under-voltage alarms were received as expected on the Standby transformer and Instrument AC. The voltage dip caused the Reactor Protection System (RPS) "alternate" Electrical Protection Assembly breaker to trip. This voltage dip also caused the "B" Reactor Water Cleanup (RWCU) Pump and the "D" Well Pump to trip. Both of these pumps have solid state controllers which are sensitive to voltage transients.

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At 0110, the "D" Well Pump was restored. At 0129, the operating crew secured the SBDGs and returned them to the standby mode. The two feeder breakers in the DAEC switchyard were reset at 0139. At 0245, the RPS "alternate" EPA breaker was reset per procedure.

II. CAUSE OF EVENT

The cause of the automatic start of the SBDGs was a sensed momentary under-voltage condition on both essential buses which are monitored by bus under-voltage relays. The relays feed directly into the SBDG start logics which seal in upon actuation. The sensed momentary under-voltage conditions were also the causes for the RWCU and well water pump trips, the RPS "alternate" EPA breaker trip, and the alarms received. The momentary undervoltage conditions were caused by the momentary grid disturbance.

III. ANALYSIS OF EVENT

This event had no effect on safe operation of the plant, nor would it have had an effect on safe operation during any other plant conditions. The SBDGs started as designed in response to the sensed momentary voltage dips on the essential buses, but were not required to load. When voltage drops to 65% of nominal on both the Startup and Standby transformers, the SBDGs automatically start. After the SBDGs reach rated frequency and voltage (10 seconds or less), they will pick up the essential busses if there is no voltage present. Since the duration of the event was so short (less than 3 seconds), the essential busses had returned to nominal voltage by the time the SBDGs came up to speed.

The "alternate" EPA breaker was not feeding the Reactor Protection System at the time of the event, so consequently had no effect on the plant. If the breaker had been in service at the time, a reactor half-scram would have resulted.

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The RWCU and well water systems are not safety related and tripping of these pumps had no adverse consequences. There were no bus transfers or load sheds during these events. All alarms and auto actuations that were received were expected.

IV. CORRECTIVE ACTIONS

Following the SBDG start, operators verified that the essential buses were being powered from their normal source and contacted the load dispatcher to share information and coordinate actions. The SBDGs were secured, one at a time, after verifying that the grid was stable. Operators took appropriate actions to restore the RWCU and well water systems. All equipment operated properly and personnel actions were appropriate, no further corrective actions were required.

V. ADDITIONAL INFORMATION

A. Previous Similar Events

LERs 91-08, 92-11, and 93-01 report automatic SBDG starts due to weather conditions.

B. EIIS System and Component Codes

Systems: FK-Switchyard System EK-Emergency Onsite Power Supply System CE-Reactor Water Cleanup System EE-Instrument and Uninterruptible Power System KG-Nonessential Service Water System BI-Essential Service Water System

Components: EK-DG-Diesel Generator

This report is being submitted pursuant to 10CFR50.73(a)(2)(iv)