

LICENSEE EVENT REPORT (LER)

FACILITY NAME (1) Duane Arnold Energy Center DOCKET NUMBER (2) 0500003311 PAGE (3) 1 OF 02

TITLE (4) Degraded Offsite Voltage

EVENT DATE (5)			LER NUMBER (6)			REPORT DATE (7)			OTHER FACILITIES INVOLVED (8)		
MONTH	DAY	YEAR	YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	MONTH	DAY	YEAR	FACILITY NAMES		DOCKET NUMBER(S)
0	7	14	84	028	00	08	13	84	None		050000
									None		050000

THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR § (Check one or more of the following) (11)

OPERATING MODE (8) N	<input type="checkbox"/> 20.402(b)	<input type="checkbox"/> 20.405(c)	<input checked="" type="checkbox"/> 50.73(a)(2)(iv)	<input type="checkbox"/> 73.71(b)
POWER LEVEL (10) 000	<input type="checkbox"/> 20.405(a)(1)(i)	<input type="checkbox"/> 50.38(c)(1)	<input type="checkbox"/> 50.73(a)(2)(v)	<input type="checkbox"/> 73.71(c)
	<input type="checkbox"/> 20.405(a)(1)(ii)	<input type="checkbox"/> 50.38(c)(2)	<input type="checkbox"/> 50.73(a)(2)(vii)	OTHER (Specify in Abstract below and in Text, NRC Form 365A)
	<input type="checkbox"/> 20.405(a)(1)(iii)	<input type="checkbox"/> 50.73(a)(2)(i)	<input type="checkbox"/> 50.73(a)(2)(viii)(A)	
	<input type="checkbox"/> 20.405(a)(1)(iv)	<input type="checkbox"/> 50.73(a)(2)(ii)	<input type="checkbox"/> 50.73(a)(2)(viii)(B)	
	<input type="checkbox"/> 20.405(a)(1)(v)	<input type="checkbox"/> 50.73(a)(2)(iii)	<input type="checkbox"/> 50.73(a)(2)(ix)	

LICENSEE CONTACT FOR THIS LER (12)

NAME James R. Probst, Technical Support Engineer TELEPHONE NUMBER 319 8511-1731017

COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT (13)

CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NRPDS	CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NRPDS
C	FK			No					

SUPPLEMENTAL REPORT EXPECTED (14) YES (if yes, complete EXPECTED SUBMISSION DATE) X NO

EXPECTED SUBMISSION DATE (15) MONTH DAY YEAR

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

On 7/14/84 at 1524, with the reactor subcritical in the startup mode at 0% thermal power, a degraded voltage condition on the offsite power grid resulted in the automatic switching of the essential buses from offsite to onsite power. As per design, the RPS logic de-energized, initiating a scram. All required systems operated as designed, including the two Diesel Generators assuming the essential loads. However, the HPCI Inboard Steam Supply Valve also closed. The reason for this response is unknown and under investigation. After consultation with the load dispatcher confirming a return to grid normality, the diesels were secured. A post-event review confirmed operability of all systems, which were then returned to service. Reactor startup commenced three and one half hours following the scram.

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LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

FACILITY NAME (1)  Duane Arnold Energy Center	DOCKET NUMBER (2)  0 5 0 0 0 3 3 1	LER NUMBER (6)			PAGE (3)	
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER		
		8 4	- 0 2 8	- 0 0	0 2	OF 0 2

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

On 7/14/84 at 1524, with the reactor at 0% thermal power, subcritical in the startup mode with rod groups one and two withdrawn and pressure at 176 psig, the essential buses were automatically transferred from offsite to onsite power due to degraded offsite grid voltage. As per design, the Reactor Protection System (JC) was de-energized during the transfer, resulting in a scram. The two essential and two non-essential 4160 kV buses (EA) were receiving offsite power via the Startup Transformer (EA) when the essential bus' undervoltage protection instrumentation sensed grid voltage less than 92.3% of nominal for 8+ seconds. Consequently the essential bus breakers tripped, as per design. The non-essential buses remained energized and no load shedding occurred as grid voltage did not drop below 65% of nominal. Both Diesel Generators (EK) auto-started upon loss of offsite power to the essential buses, and within ten seconds had assumed the essential bus' loads. The degraded voltage was caused by the accidental motoring of a 650 MWe generator for over twenty seconds at the Louisa Generating Station (fossil fuel) of Iowa Illinois Gas and Electric in Muscatine, Iowa.

Upon switching of the essential buses from offsite to onsite power, the RPS motor-generator set (JC) was de-energized, resulting in the Electrical Protection Assembly breakers (EC) tripping. This, in turn, de-energized the RPS logic, causing the scram. As per design, Group 1, 2, 3, 4, and 5 isolations and Reactor Building isolation occurred. The Recirculation Pumps (AD) tripped, the Circulation Water pumps (KE) tripped, the Control Rod Drive pump (AA) in use, pump B, tripped, the Recirculation pump trip breakers (EA) tripped, the Uninterruptable AC Motor-Generator set (EE) was transferred to DC, the Control Building habitability systems (VI) isolated, and several other systems powered off the essential buses also responded, all per plant design. The Process Computer (IQ) failed at the time of the scram due to a momentary electrical disturbance as its power source, the Uninterruptable AC Motor-Generator set, was transferred to DC. In addition, its "B" Drum Cabinet (for memory storage) and the Virtual Address Extension disk drives and CPU were without power during the switchover from offsite to onsite power, as they are powered off an essential bus.

The HPCI Inboard Steam Supply Valve (BJ-ISV-2238) closed following the scram. Although this was not per design, if necessary the valve could have been opened within a short time by manual operation after resetting the HPCI logic, which was later done at 1810 after Operations personnel had returned other systems to normal. The isolation signal was received from the Steam Leak Detection System (IJ). Extensive review indicates the signal origin may have been either or both of two temperature differential switches within the Steam Leak Detection System logic. These switches contain elements powered off essential buses, and therefore would have lost and regained power during the switchover to onsite power, possibly resulting in a spurious signal(s). Investigation is continuing.

The reactor scram was reset at 1556, following the restarting of the RPS m-g sets. All required systems were returned to normal by 1600. At 1620, after the Iowa Electric system control center had advised the plant that recurrence of the grid voltage excursion was unlikely, the essential buses were transferred back to the start-up transformer, and both diesels were unloaded. The diesels were secured at 1642. After a post-event review had determined the operability of all safety-related systems and that there had been no effect upon safe plant operation, startup of the reactor was commenced at 1901.

Iowa Electric Light and Power Company

August 13, 1984  
DAEC-84-512

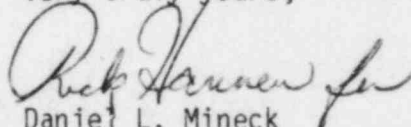
U. S. Nuclear Regulatory Commission  
Document Control Desk  
Washington, D. C. 20555

Subject: Duane Arnold Energy Center  
Docket No. 50-331  
Op. License DPR-49  
Licensee Event Report No. 84-028

Gentlemen:

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

Very truly yours,



Daniel L. Mineck  
Plant Superintendent - Nuclear  
Duane Arnold Energy Center

DLM/JRP/kp

attachment

cc: Mr. James G. Keppler  
Regional Administrator  
Region III  
U. S. Nuclear Regulatory Commission  
799 Roosevelt Road  
Glen Ellyn, IL 60137

NRC Resident Inspector - DAEC

File A-118a

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