Commonwealth Edison
LaSalle County Nuclear Station
Rural Route #1, Box 220
Marseilles, Illinois 61341
Telephone 815/357-6761

DATE: July 14, 1989

Director of Nuclear Reactor Regulation
U.S. Nuclear Regulatory Commission
Mail Station P1-137
Washington, D.C. 20555

Dear Sir:

Licensee Event Report #89-008-00, Docket #050-374 is being submitted to your office in accordance with 10CFR50.73(a)(2).

for G. J. Diederich
Station Manager
LaSalle County Station

GJD/PSS/kg

Enclosure

xc: Nuclear Licensing Administrator
NRC Resident Inspector
NRC Region III Administrator
INPO - Records Center

IE22
1/1

LICENSEE EVENT REPORT (LER)

Form Rev 2.0

Facility Name (1)	Docket Number (2)	Page (3)
LaSalle County Station Unit 2	0 5 0 0 0 3 7 4	1 of 0 5

Title (4)

HPCS DG Unit 2

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)
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0 6	1 4	8 9	8 9	0 0 8	0 0	0 7	1 4	8 9		0 5 0 0 0

OPERATING MODE (9)		THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10CFR (Check one or more of the following) (11)			
POWER LEVEL (10)	9 5.8	20.402(b)	20.405(c)	50.73(a)(2)(iv)	73.71(b)
		20.405(a)(1)(i)	50.36(c)(1)	50.73(a)(2)(v)	73.71(c)
		20.405(a)(1)(ii)	50.36(c)(2)	X 50.73(a)(2)(vii)	Other (Specify in Abstract below and in Text)
		20.405(a)(1)(iii)	50.73(a)(2)(i)	50.73(a)(2)(viii)(A)	
		20.405(a)(1)(iv)	50.73(a)(2)(ii)	50.73(a)(2)(viii)(B)	
		20.405(a)(1)(v)	50.73(a)(2)(iii)	50.73(a)(2)(x)	

LICENSEE CONTACT FOR THIS LER (12)

Name	TELEPHONE NUMBER
	AREA CODE
Paul Sampson, Technical Staff Engineer, Extension 2704	8 1 5 3 5 7 - 6 7 6 1

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

CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NPRDS	CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NPRDS
D	E K	5 2	G 0 8 0	Y					

SUPPLEMENTAL REPORT EXPECTED (14)		Expected Submission Date (15)	Month	Day	Year
Yes (If yes, complete EXPECTED SUBMISSION DATE)	X NO				

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

On June 14, 1989 at approximately 1200 hours, with Unit 2 at 95.8 percent power in operational condition 1, the Unit 2 System Auxiliary Transformer (SAT) had just been returned to service following the replacement of the primary "A" phase bushing. While attempting to parallel the 2B DG with its offsite power source (SAT), the SAT feed breaker (ACB 2432) to bus 243 closed unexpectedly.

Personnel in the control room did not observe any significant DG deviations from normal operation. The 2B DG was subsequently shutdown and an inspection of the generator stator windings revealed some minor damage had occurred. This damage was apparently due to the inadvertent out of phase closure of the SAT feed breaker. The automatic closure of the SAT feed breaker was due to one of its secondary stabs being bent causing a short which effectively jumpered the breaker closing circuit permissives. The damaged stab resulted from procedural deficiencies.

The consequences of the event were minimal with respect to plant safety. The 2B DG and the High Pressure Core Spray (HPCS) system were already inoperable prior to this event (See LER 89-007-00). This event, however, damaged a major piece of plant equipment. Because the effects of the winding damage could not be determined, the entire generator was replaced. The HPCS system and the 2B DG were declared operable on June 27, 1989 at approximately 0535 hours after being inoperable for approximately 305 hours for this event.

PLANT AND SYSTEM IDENTIFICATION

General Electric - Boiling Water Reactor

Energy Industry Identification System (EIIS) codes are identified in the text as [XX].

A. CONDITION PRIOR TO EVENT

Unit(s): 2 Event Date: 6/14/89 Event Time: 1200 Hours

Reactor Mode(s): 1 Mode(s) Name: Run Power Level(s): 95.8%

B. DESCRIPTION OF EVENT

On June 14, 1989 at approximately 1200 hours, with Unit 2 at 95.8 percent power in operational condition 1, the Unit 2 System Auxiliary Transformer (SAT) [EB] had just been returned to service and the SAT feed breaker ACB 2432 racked back in to its cubicle following the replacement of the primary "A" phase bushing. At this time the 2B Diesel Generator (DG) [EK] was supplying Division III bus 243, due to the System Auxiliary Transformer (SAT) being out-of-service. The SAT is the normal power source for bus 243. Although functional, the 2B DG was not operable because some post maintenance testing was necessary to close out work performed prior to the SAT problem. With the return of the SAT, preparations were underway to parallel the SAT (main power grid) to bus 243 and the 2B DG. The synchroscope between the grid and bus 243 was enabled, and the Nuclear Station Operator (NSO) adjusted bus 243 voltage and frequency (via the 2B DG) until the grid and bus voltage were synchronized. The NSO then attempted to close the SAT feed breaker to bus 243 (ACB 2432). The breaker failed to close. The NSO then placed the breaker control switch to the NORMAL-AFTER TRIP position and turned the synchroscope off. This action would normally remove the breaker closure permissive. There are no automatic auto-close signals to this breaker. At this point, Technical Staff assistance was requested. Breaker 2432 closing circuit voltages taken across the closing permissives (synchroscope on, and 2432 handswitch in close) indicated no continuity between the handswitch contacts and the closing coil. Technical Staff and Operating Department personnel then proceeded to the 2432 breaker cubicle to investigate further. Physical inspection of the breaker revealed that it did not seem to be fully in the "raised" position. The breaker must be fully raised (racked in) in order for the breaker limit switches to operate properly. One of these "breaker raised" limit switches, operates in the closure permissive circuit. This limit switch prevents breaker closure attempts with the breaker not racked in (raised). It was determined by Technical Staff personnel that the breaker was not fully raised, hence the "breaker raised" limit switch was not physically closed preventing breaker closure. The closing and tripping fuses were removed, the breaker racked out (lowered), and racked back in, and the fuses re-installed. Closure circuit status was checked again, indicating the problem still existed. This breaker lower and raise procedure was repeated two additional times. On the third attempt, the breaker seemed to fully raise to the racked in position. When the closing fuses were replaced, the SAT feed breaker to bus 243 unexpectedly closed.

ACB 2432 closure onto bus 243 immediately connected two separate sources of power (the main power grid and 2B DG) in an unsupervised manner. Personnel in the control room did not observe any significant DG deviations from normal operation. The 2B DG did not trip, nor did its output breaker ACB 2433. The 2B DG continued to operate, loaded to 2200KW, for approximately 2 hours following this event. The 2B DG was subsequently shut down after it was recommended by off-site Operational Analysis Department (OAD) to make an inspection of the 2B generator stator windings before returning the DG to service. This inspection revealed some stator windings had shifted position by approximately 1/4" to 3/8" (maximum).

B. DESCRIPTION OF EVENT (continued)

Prior to this event the 2B DG had been supplying bus 243 for approximately 52 hours during the SAT repairs. (See LER 89-007-00.) The High Pressure Core Spray (HPCS) [LB] pump was started, and ran for the duration of the 52 hour DG run in the Full Flow Test mode. This was done to maintain the DG load above the minimum requirement for safe continuous operation of the engine. Prior to the SAT tripping, the 2B DG was out of service awaiting a functional calibration check of Wattmeters that were replaced. This calibration check required the DG to be loaded above 2200 KW, which is above the maximum load of the HPCS pump (2200 KW), therefore the functional check could not be performed, and the 2B DG was administratively inoperable 57 hours before the auto-closure of the SAT feed breaker. The HPCS system was also inoperable during this time due to the SAT and the 2B DG being inoperable. The 2B DG and HPCS system remained inoperable until June 27, 1989 at 0535 hours after the replacement and testing of a new Generator was completed. The 2B DG and HPCS system was inoperable for an additional 305 hours due to this event.

C. APPARENT CAUSE OF EVENT

The apparent cause of generator winding shift was the inadvertent closure of SAT feed breaker ACB 2432 to bus 243. The inadvertent closure of this breaker caused the 2B DG to be paralleled out of phase. A detailed inspection of the generator by OAD and the generator vendor revealed that the damage, although minor, was very recent. The fact there was only minor damage, and no significant deviations when the event occurred, indicated that the 2B DG must not have been too far out of phase when it paralleled with its offsite power source.

The cause of the SAT feed breaker auto-closing was a portion of one of its secondary stabs being bent. Each stabs consists of four (4) separate conductors that are closely spaced together. One of the four (4) conductors on this stab was bent in such a way that it was making contact with another stab. The shorting of these two stabs effectively jumpered the breaker closing circuit permissives. This in turn caused the breaker to auto-close. The purpose of the secondary stabs is to connect the breaker control circuit logic to the breaker when the breaker is raised (Racked In). The male stabs are mounted on the top of the breaker and the female stabs are mounted above in the breaker cubicle. When the breaker is raised, the male and female stabs are connected. LaSalle Station believes that this stab was partially bent prior to racking it in to the cubicle. When the breaker was raised, the bent portion of the stab prevented the breaker from fully raising. The repeated attempts to raise and lower the breaker bent the stab a little more each time, until it finally bent enough to make contact with another stab.

The apparent cause of the bent stab was procedure deficiencies. LOP-AP-04 "Racking in G.E. 4160 Volt Motor operated AIR Circuit Breakers" does not require inspection of these stabs prior to raising the breaker. It also does not require placing a protective cover on these stabs when the breaker is removed from its cubicle to prevent damage to the stabs. LES-GM-106 "Inspection and Maintenance of G. E. MAGNA-BLAST Circuit Breakers also does not require placing a protective cover on these stabs when maintenance is being performed on these breakers. It also does not require inspecting for bent stabs.

D. SAFETY ANALYSIS OF EVENT

The consequences of the event were minimal with respect to plant safety. This event, however, damaged a major piece of plant equipment. The 2B DG and HPCS system were already declared inoperable prior to the

D. SAFETY ANALYSIS OF EVENT (continued)

SAT feed breaker auto-closing. The Reactor Core Isolation Cooling system (RCIC) [BN] was operable as an alternate high pressure injection system before, and during this event. Division I and II Emergency Core Cooling Systems (ECCS) were also operable before, and during this event. The HPCS system and the 2B DG were declared operable on June 27, 1989 at approximately 0535 hours after being inoperable for approximately 305 hours due to this event. All requirements of Technical Specifications 3.8.1.1 and 3.5.1 were followed during this event.

E. CORRECTIVE ACTIONS

The 2B DG was inspected for damage at the request of offsite OAD. LaSalle Special Test LST-89-066 "Unit 2 Division III SAT Feedbreaker ACB 2432 Troubleshooting" was performed to determine the cause of the breaker auto-closing. The bent stab was found during the performance of this test. The breaker with the bent stab was then removed from the SAT feed breaker cubicle and the breaker from the 2B DG output Breaker ACB 2433 cubicle was racked into the SAT feed breaker cubicle. Prior to raising the breaker, the secondary stabs were inspected for damage. Once the breaker was raised, continuity checks with the control circuit fuses removed were performed to verify that no short circuit paths to the closing coil existed. The SAT feed breaker was then closed to re-energize bus 243 with no abnormalities.

The generator inspection revealed a minor shift in some of the stator windings, but the generator appeared to still be functional. Resistance checks taken after shutdown were satisfactory, and prior to the shutdown the generator ran for 2 hours loaded to 2200 KW. Although the damage appeared to be minor, LaSalle Station decided to take a conservative approach and replace the generator. The replacement generator used was the old 2A DG generator that was rebuilt in 1984. Preventative maintenance under the supervision of the generator vendor (Ideal Electric) was performed on the rebuilt generator prior to installing it on the 2B DG. All of the work and testing performed on the 2B DG was documented in LST-89-074 "2B DG Return to Service Following Generator Replacement". The post replacement testing lasted approximately 58 hours. LST-89-074 also documented all of the Technical Specification surveillance requirements that were performed and which surveillances and/or special tests covered them.

LOP-AP-04 and LES-GM-106 was given to General Electric (G.E.) (The Breaker Vendor) for comments. G.E. was also contacted by telephone on the subject of the bent secondary stab. G.E. stated that these stabs should be inspected prior to raising the breaker, and that a protective cover should be placed on the stabs when the breaker is lowered and removed from the cubicle for extended periods of time, or when maintenance is being performed on these breakers. G.E. also came on site to perform their own inspection of the SAT feed breaker and concurred that the cause of the auto-closure was the bent stab. LOP-AP-04 and LES-GM-106 currently do not have steps to inspect for bent stabs or for installing a protective cover. Action Item Record (AIR) 374-200-89-02001 has been written to revise and track completion of the revisions of LOP-AP-04 and LES-GM-106 to include the steps necessary to perform the stab inspection and to install the protective cover.

F. PREVIOUS EVENTS

None

G. COMPONENT FAILURE DATA

Manufacturer	Nomenclature	Model Number	MFG Part Number
General Electric	4160 Volt Circuit Breaker	AM-4.16-350	