NRC FORM 366 (7-77)

U. S. NUCLEAR REGULATORY COMMISSION

LICENSEE EVENT REPORT

CONTROL BLOCK: (1) (PLEASE PRINT OR TYPE ALL REQUIRED INFORMATION)

Line	Field	Value
01	LICENSEE CODE (2)	N C B E P 2
	LICENSE NUMBER (3)	0 0 - 0 0 0 0 0 - 0 0
	LICENSE TYPE (4)	4 1 1 1 1
	CAT (5)	
01 (CON'T)	REPORT SOURCE (6)	L
	DOCKET NUMBER (7)	0 5 0 - 0 3 2 4
	EVENT DATE (8)	1 0 1 0 8 2
	REPORT DATE (9)	1 1 0 9 8 2

EVENT DESCRIPTION AND PROBABLE CONSEQUENCES (10)

02 During an orderly reactor shutdown, while attempting to automatically transfer bus 2D
03 from the unit auxiliary transformer (UAT) to the unit startup transformer (SAT) a
04 loss of 4160 V emergency bus E-3 occurred. In addition, No. 3 diesel generator was
05 determined to be inoperable. This event did not affect the health and safety of the
06 public.
07 Technical Specifications 3.8.1.1, 3.8.2.1, 6.9.1.9b
08

09	SYSTEM CODE (11)	CAUSE CODE (12)	CAUSE SUBCODE (13)	COMPONENT CODE (14)	COMP. SUBCODE (15)	VALVE SUBCODE (16)
	E B	E	A	C K T B R K	F	Z

(17) LER/RO REPORT NUMBER	EVENT YEAR		SEQUENTIAL REPORT NO.		OCCURRENCE CODE	REPORT TYPE		REVISION NO.
	8 2	—	1 2 3	/	0 3	L	—	0

ACTION TAKEN (18)	FUTURE ACTION (19)	EFFECT ON PLANT (20)	SHUTDOWN METHOD (21)	HOURS (22)	ATTACHMENT SUBMITTED (23)	NPRD-4 FORM SUB. (24)	PRIME COMP. SUPPLIER (25)	COMPONENT MANUFACTURER (26)
D	X	A	C	0 0 2 6	Y	Y	L	I 2 0 3

CAUSE DESCRIPTION AND CORRECTIVE ACTIONS (27)

10 This event occurred because both the SAT output breaker and No. 3 diesel generator
11 output breaker failed to close when the UAT output breaker was opened. The UAT
12 breaker, Model No. 5HK350, was installed in place of the SAT breaker and power to E-3
13 was restored. Procedural changes were implemented to compensate for simultaneous
14 close and open signals to the diesel generator's output breakers under certain conditions.

15	FACILITY STATUS (28)	% POWER (29)	OTHER STATUS (30)	METHOD OF DISCOVERY (31)	DISCOVERY DESCRIPTION (32)
	X	0 1 7	NA	A	Operational Event

16	ACTIVITY RELEASED (33)	CONTENT OF RELEASE (34)	AMOUNT OF ACTIVITY (35)	LOCATION OF RELEASE (36)
	Z	Z	NA	NA

PERSONNEL EXPOSURES

17	NUMBER (37)	TYPE (38)	DESCRIPTION (39)
	0 0 0	Z	NA

PERSONNEL INJURIES

18	NUMBER (40)	DESCRIPTION (41)
	0 0 0	NA

8211170265 821109
PDR ADOCK 05000324
S PDR

LOSS OF OR DAMAGE TO FACILITY (43)

19	TYPE (42)	DESCRIPTION
	Z	NA

PUBLICITY

20	ISSUED (44)	DESCRIPTION (45)	NRC USE ONLY
	N	NA	

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GPO 917-926

LER ATTACHMENT - RO #2-82-123

Facility: BSEP Unit No. 2 Event Date: October 10, 1982

While performing an orderly reactor shutdown, an attempt to manually transfer the power source to bus 2D from the unit auxiliary transformer (UAT) to the unit startup transformer (SAT) failed. When an attempt was made to effect an automatic transfer of the power source to bus 2D, a loss of voltage to 2D, and thus emergency bus E-3, occurred. The loss of bus E-3 rendered 2A core spray pump and 1A and 2A RHR pumps inoperable due to lack of their normal and emergency power supplies.

This event occurred when the UAT output breaker was manually opened and the SAT output breaker, ITE Canda Model No. 5HK350, failed to automatically close in to supply bus 2D. Prior to this event, No. 3 diesel generator had been started under Control Room manual control and brought up to operating speed with the diesel generator output breaker open. This was done so that the diesel would be up to speed if the transfer failed. Emergency bus E-3 is normally supplied from bus 2D and No. 3 diesel generator is the emergency standby power source to E-3. Immediately following the failure of the SAT output breaker, No. 3 diesel generator failed to close on bus E-3. This rendered bus E-3 dead which assisted in causing a scram and Group I isolation.

Shortly after this event, a quick trouble check of the SAT output breaker determined a problem within the breaker. The UAT output breaker was then installed in the SAT output breaker compartment and power to bus 2D was restored from the SAT within one hour and 45 minutes of the event. In addition, bus E-3 was reenergized. A close inspection and troubleshooting of the failed SAT output breaker revealed the breaker had failed to automatically close as a result of a sheared breaker charging spring motor actuator. The charging spring motor casing mounting screw had backed out of the motor housing causing the motor actuator to shear and separate from the breaker which prevented charging the breaker charging springs for breaker closing capability. The failed breaker from the SAT output breaker compartment was then repaired using a replacement charging motor assembly, tested satisfactorily for operation and installed in the UAT output breaker compartment.

An investigation into the failure of the output breaker of No. 3 diesel generator to close in to bus E-3 revealed that simultaneous close and open signals to the breaker prevented automatic closing of the breaker on loss of voltage to bus E-3. The plant emergency buses utilize a high speed undervoltage relay which applies a one-second trip open signal to the applicable diesel generator output breaker on loss of voltage to the bus. This relay ensures the diesel generator is separated from an abnormal emergency bus on loss of voltage. In addition, plant emergency buses utilize an inverse time undervoltage relay (1.5 seconds) which causes loads to be shed from the emergency bus on loss of bus voltage. This permits tying the diesel to its applicable bus after the bus is stripped. While the diesel generator is in Control Room manual or local manual, a loss of voltage to the E-bus will result in a failure of the diesel to close on the E-bus. This condition conflicts with the system design in that the design accounts for an instantaneous voltage drop on the E-bus. In reality a voltage drop on the bus will occur somewhat slower and varies with the loads on the bus.

The bus inverse time undervoltage relay will sense the voltage drop condition when it decreases to approximately 82% of normal, and the high speed undervoltage relay senses the voltage drop condition at some percentage less than 40 percent of normal. As a result, bus loads shed and a close signal to the diesel generator output breaker occurs before the high speed undervoltage relay one-second trip signal is removed, thus preventing the output breaker from closing. To close the diesel generator output breaker in this situation, the high speed undervoltage relay close signal must be removed and reapplied. The investigation determined this can be accomplished by placing the keylock remote shutdown switch on the applicable E-bus switchgear breaker compartment to the local position and then back to normal.

As a result of this event, plant procedural changes were developed, approved and implemented to provide plant operators with directions for dealing with a loss of normal power source to the E-bus with a diesel generator running in the Control Room manual or local manual controlling mode and not tied to the E-bus. As this condition does not apply if the diesel generator is auto started from the shutdown condition, which is the normal standby configuration for the diesel generator, it is felt the procedural changes provide a sufficient short-term method to overcome the design deficiency. Plant Engineering is presently evaluating this condition and will develop an applicable design modification to eliminate the problem. As a result of the SAT output breaker failure, applicable plant surveillance procedures have been revised as required to perform a check of plant 4160V switchgear charging spring mounting attachment bolts during periodic preventative maintenance operability inspections of the breaker mechanisms.