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FACIL:50-287 Oconee Nuclear Station, Unit 3, Duke Power Co. 05000287
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Region 2, Atlanta, Office of the Director

SUBJECT: LER 80-008/03L-0:on 800507,shutdown was initiated when reactor protective sys channel B was lost due to inverter failure,Caused by blown fuses,Power to ac vital instrumentation restored manually & fuses replaced.

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JUN 13 1980

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DUKE POWER COMPANY
OCONEE UNIT 3

Report Number: RO-287/80-8

Report Date: June 5, 1980

Occurrence Date: May 7, 1980

Facility: Oconee 3, Seneca, South Carolina

Identification of Occurrence: Power Lost to RPS Channel B

Conditions Prior to Occurrence: 100% Full Power

Description of Occurrence:

At 0916 on May 7, 1980, static inverter 3DIB, which supplies power from 125 VDC instrumentation and control power panelboard 3DIB to AC vital instrumentation power panelboard 3KVIB, tripped while Oconee 3 was operating at 100% full power. At 0920 on May 7, power was restored to panelboard 3KVIB by manually bypassing static inverter 3DIB. However, one of the loads lost when power was interrupted was Reactor Protection System (RPS) Channel B. Since RPS Channel C had already been bypassed for testing, a shutdown was initiated at 0923 pursuant to Oconee Nuclear Station Technical Specification 3.5.1, which requires that aminimum of three of the four RPS channels be available. At 0930 RPS Channel B and the other lost loads were reset, and the unit was returned to 100% full power by 0950. On May 8 static inverter 3DIB was returned to service. At 1354 on May 9, the inverter again tripped. A power reduction was initiated but was terminated at 1402 after the inverter was again bypassed and RPS Channel B was reset. On May 16 power to panelboard 3KVIB was momentarily lost when an attempt was made to return the inverter to service. RPS Channel B was again reset, and inverter 3DIB was returned to service.

Apparent Cause of Occurrence:

Static inverter 3DIB tripped on May 7 due to a blown fuse. When the same fuse blew on May 9, an examination of all the logic boards in the inverter was made to identify any faulty components. A failed transistor was discovered, and it apparently had begun breaking down when the original inverter failure occurred, then cooled and operated properly for two days before failing completely. On May 16, a fuse blew when an attempt was made to transfer power to panelboard 3KVIB from the regulated AC power supply back to inverter 3DIB. The switch immediately reverted to the regulated AC line. It is possible that a bypass switch may have been closed when the transfer was attempted, allowing power to be supplied from both sources in parallel, and causing the fuse to blow.

Analysis of Occurrence:

A unit shutdown was initiated as required by Technical Specification 3.5.1 when power to RPS Channel B was lost, since RPS Channel C had already been bypassed for testing. Although the inverter failure caused a loss of the loads from panelboard 3KVIB, the remaining three AC vital instrumentation power panelboards

Analysis of Occurrence (Continued)

were in service, and sufficient instrumentation was available for a safe and controlled shutdown. In addition, power to panelboard 3KVIB was interrupted only briefly each time, since timely manual action was taken to bypass the inverter. However, this incident resulted in initiation of a shutdown as required by a limiting condition for operation, and must therefore be reported pursuant to Technical Specification 6.6.2.1.b(2), although it was considered to be of no significance with respect to safe operation, and the health and safety of the public were not affected.

Corrective Action:

The immediate corrective action was to bypass the inverter and reset the loads which were lost from panelboard 3KVIB. After the first occurrence, the fuse was replaced and the logic voltage and inverter wiring were checked. The examination of the logic boards after the second occurrence revealed the faulty transistor. After repairs were made the inverter was tested for four days before being returned to service. A further investigation revealed that the Oconee 3 inverters operate at higher temperatures than those for Oconee 1 and 2. An evaluation of possible effects on premature aging of components will be made.

NRC FORM 366 (7-77)

U. S. NUCLEAR REGULATORY COMMISSION

LICENSEE EVENT REPORT

EXHIBIT A

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

01 | S C N E B 3 (2) 0 0 - 0 0 0 0 0 - 0 0 (3) 4 1 1 1 1 (4) | | (5)
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CON'T 01 | REPORT SOURCE L (6) 0 5 0 0 0 2 8 7 (7) 0 5 0 7 8 0 (8) 0 6 0 5 8 0 (9)
DOCKET NUMBER | EVENT DATE | REPORT DATE

EVENT DESCRIPTION AND PROBABLE CONSEQUENCES (10)

02 Shutdown of Oconee 3 was initiated when power to RPS Channel B was lost due
03 to an inverter failure, since RPS Channel C had already been bypassed for
04 testing. Shutdown was terminated shortly thereafter when the inverter was
05 manually bypassed. The shutdown was initiated in accordance with Technical
06 Specification 3.5.1. In addition, sufficient instrumentation was available
07 for a safe and orderly shutdown. Thus, this incident did not affect safe
08 operation and the health and safety of the public were not affected.

SYSTEM CODE	CAUSE CODE	CAUSE SUBCODE	COMPONENT CODE	COMP. SUBCODE	VALVE SUBCODE
09 I A (11)	E (12)	A (13)	G E N E R A (14)	F (15)	Z (16)

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

ACTION TAKEN	FUTURE ACTION	EFFECT ON PLANT	SHUTDOWN METHOD	HOURS (22)	ATTACHMENT SUBMITTED	NPRD-4 FORM SUB.	PRIME COMP. SUPPLIER	COMPONENT MANUFACTURER
A (18)	X (19)	B (20)	A (21)	0 0 0 0	Y (23)	Y (24)	L (25)	E 3 5 5 (26)

CAUSE DESCRIPTION AND CORRECTIVE ACTIONS (27)

10 The inverter failed twice due to blown fuses. After the second occurrence,
11 a faulty transistor was discovered and replaced. Power to the AC vital
12 instrumentation bus which was lost due to the inverter failure was restored
13 manually each time, and the fuses were then replaced. An evaluation of the
14 relatively high operating temperatures of the Oconee 3 inverter will be made.

15 FACILITY STATUS: E (28) % POWER: 1 0 0 (29) OTHER STATUS (30): NA METHOD OF DISCOVERY: A (31) DISCOVERY DESCRIPTION (32): Operator Observation

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

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

18 PERSONNEL INJURIES NUMBER: 0 0 0 (40) DESCRIPTION (41): NA

19 LOSS OF OR DAMAGE TO FACILITY (43) TYPE: Z (42) DESCRIPTION: NA

20 PUBLICITY ISSUED: N (44) DESCRIPTION (45): NA

NRC USE ONLY

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