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SUBJECT: Interim deficiency rept re tripped inverters disrupting power to essential components. Initially reported on 870312. Further testing will be conducted until replacements installed. Final rept submitted 6 months before fuel load.

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BLRD-50-438/87-01

10 CFR 50.55(e)

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

Gentlemen:

BELLEFONTE NUCLEAR PLANT (BLN) UNIT 1 - INVERTERS TRIPPED DISRUPTING POWER TO
ESSENTIAL COMPONENTS - BLRD-50-438/87-01 - INTERIM REPORT

The subject deficiency was initially reported to NRC-Region II Inspector
Art Johnson on March 12, 1987, in accordance with 10 CFR 50.55(e) as
NCR BLN 5102. Enclosed is our interim report. We expect to submit our final
report on or about six months before fuel load of unit 1. The applicability
of 10 CFR 21 to this deficiency has not yet been determined.

If there are any questions, please get in touch with D. L. Terrill at
(205) 574-8820.

Very truly yours,

TENNESSEE VALLEY AUTHORITY

J. A. Damer
R. L. Gridley, Director
Nuclear Safety and Licensing

Enclosure
cc: See page 2

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U.S. Nuclear Regulatory Commission

APR 17 1987

cc (Enclosure):

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ENCLOSURE
BELLEFONTE NUCLEAR PLANT UNIT 1
INVERTERS TRIPPED DISRUPTING POWER TO ESSENTIAL COMPONENTS
BLRD-50-438/87-01
10 CFR 50.55(e)
SCR BLN 5102
INTERIM REPORT

Description of Deficiency

On December 23, 1986, a voltage surge occurred in the 161-kV and 500-kV switchyards. Uninterruptible power supplies (UPS'), consisting of rectifier/inverter assemblies, 1EJ-EUPS-60-D and 1EJ-EUPS-63-G, tripped disrupting power to vital 120-VAC circuits. UPS 1EJ-EUPS-60-D blew fuse 4 (to inverter power assembly) four times; once on the initial event and three times subsequently. Following the initial event, the fuse was replaced and the unit appeared to work properly for several days, then the fuse blew again. The fuse was replaced again and the unit worked for several days, then the fuse blew again. The D inverter circuit boards were aligned for testing and the fuse replaced but blew again on February 16, 1987. The individual component generating the failure and its particular failure mechanism cannot be determined within the limited scope of testing performed to date. The UPS' have a history of maintenance problems and failures. It is, therefore, believed that the cause of the problem is due to defect(s) in the UPS' themselves.

The concern is currently limited to UPS' supplied by International Power Machines (IPM) Corporation, Mesquite, Texas. The IPM models involved are 6348-040L-6112-XXDK-0461 for 50-kVA and 6348-007L-6112-XXDK-0462 for 7.5-kVA.

If these UPS' had been in service during plant operation when the two units tripped on December 23, 1986, all essential equipment relying solely on vital uninterruptible trained ac 120-V power from Channels D and G would not have functioned. Power would have been lost to Balance-of-Plant (BOP) instrumentation, nuclear instrumentation reactor protection system (NIRPS) Channels D and G, engineered safety features actuation system (ESFAS) (two analogs and one digital) and some individual system components. A trip of the NIRPS and an ESFAS actuation would have been initiated. The equipment powered solely from these UPS' would have had to be manually transferred to the maintenance source. The three failures of Channel D subsequent to December 23, 1986, would not have initiated an ESFAS actuation or NIRPS trip.

Interim Progress

Because of the number of previous problems and not being able to obtain replacement parts and service from the vendor, the decision to replace these UPS' before fuel loading has already been made. Further testing will be conducted to determine the nature of the problem and to make repairs as necessary to use the UPS' until replacements are installed.