TENNESSEE VALLEY AUTHORITY
CHATTANOOGA, TENNESSEE 37401
400 Chestnut Street Tower II

April 25, 1985

BLRD-50-438/82-51
BLRD-50-439/82-46

U.S. Nuclear Regulatory Commission
Region II
Attn: Dr. J. Nelson Grace, Regional Administrator
101 Marietta Street, NW, Suite 2900
Atlanta, Georgia 30323

Dear Dr. Grace:

BELLEFONTE NUCLEAR PLANT UNITS 1 AND 2 - DEFICIENCY IN UNDERVOLTAGE PROTECTION DURING AN ACCIDENT - BLRD-50-438/82-51, BLRD-50-439/82-46 - FINAL REPORT

The subject deficiency was initially reported to NRC-OIE Inspector R. V. Crlenjak on July 27, 1982 in accordance with 10 CFR 50.55(e) as NCR BLN EEB 8205. This was followed by our interim reports dated August 25 and November 19, 1982, January 17 and September 15, 1983 and April 17 and October 11, 1984. Enclosed is our final report.

If you have any questions concerning this matter, please get in touch with R. H. Shell at FTS 858-2688.

Very truly yours,

TENNESSEE VALLEY AUTHORITY

J. A. Domer

W. W. Hufham, Manager
Licensing and Regulations

Enclosure
cc (Enclosure):
Mr. James Taylor, Director
Office of Inspection and Enforcement
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

Records Center
Institute of Nuclear Power Operations
1100 Circle 75 Parkway, Suite 1500
Atlanta, Georgia 30339

ENCLOSURE

BELLEFONTE NUCLEAR PLANT UNITS 1 AND 2
DEFICIENCY IN UNDERVOLTAGE PROTECTION DURING AN ACCIDENT
NCR BLN EEB 8205
BLRD-50-438/82-51, BLRD-50-439/82-46
10 CFR 50.55(e)
FINAL REPORT

Description of Deficiency

During a review, it was determined that the present design of the additional level of undervoltage or overvoltage protection does not fully comply with the requirements as stated in Bellefonte Nuclear Plant (BLN) Final Safety Analysis Report (FSAR) question 430.38 and the guidelines in NRC branch technical position (BTP) PSB-1. Misinterpretation of these requirements by TVA caused the present design not to consider a degraded voltage concurrent with an accident. Because of this misinterpretation, the time delay selected to initiate separation of the class 1E distribution system from the degraded offsite power system will not permit connection to the alternate or emergency feeder soon enough to ensure adequate voltages for the required safety motors.

Safety Implications

Excessive delay in separating safety-related motors from a degraded voltage source and connecting to an emergency feeder could allow voltage levels to degrade sufficiently to cause motor speeds to drop below the optimum point for the reestablishment of nominal voltage levels. This could result in additional delay in starting the safety-related motors necessary to mitigate a design basis accident (DBA). As such, this condition could have adversely affected plant safety.

Corrective Action

TVA has revised its design criteria, N4-RPD775A, to incorporate the design modifications necessary to satisfy the NRC Staff position on degraded voltage protection and the voltage and time-delay set points for the degraded voltage design have been included in the BLN ac auxiliary power system review, D288-G10190 RP. Design changes and field modifications have been completed through engineering change notice (ECN) 1559.

Because this problem was caused by a misinterpretation of the original NRC Staff requirements by TVA (the NRC has published a clarification of the requirements in BTP PSB-1) and TVA has incorporated the correct interpretation in the plant design criteria, no further action to prevent recurrence is required.