

TENNESSEE VALLEY AUTHORITY

CHATTANOOGA, TENNESSEE 37401

400 Chestnut Street Tower II

April 2, 1982

BLRD-50-438/81-12

BLRD-50-439/81-12

U.S. Nuclear Regulatory Commission
Region II

Attn: Mr. James P. O'Reilly, Regional Administrator
101 Marietta Street, Suite 3100
Atlanta, Georgia 30303

Dear Mr. O'Reilly:

BELLEFONTE NUCLEAR PLANT UNITS 1 AND 2 - CAPACITORS ON CONSOLIDATED CONTROL
CORPORATION FIELD BUFFER CARDS - BLRD-50-438/81-12, BLRD-50-439/81-12 -
FINAL REPORT

The subject deficiency was initially reported to NRC-OIE Inspector
M. Thomas on January 23, 1981, in accordance with 10 CFR 50.55(e) as
NCR 1309. This was followed by our interim reports dated February 23,
May 27, June 19, and July 9, 1981 and January 11, 1982. Enclosed is our
final report. We consider 10 CFR Part 21 to be applicable to this
deficiency.

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

L. M. Mills

L. M. Mills, Manager
Nuclear Regulation and Safety

Enclosure

cc: Mr. Richard C. DeYoung, Director (Enclosure)
Office of Inspection and Enforcement
U.S. Nuclear Regulatory Commission
Washington, DC 20555



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ENCLOSURE

BELLEFONTE NUCLEAR PLANT UNITS 1 AND 2 CAPACITORS ON CONSOLIDATED CONTROL CORPORATION FIELD BUFFER CARDS

NCR 1309

BLRD-50-438/81-12, BLRD-50-439/81-12

FINAL REPORT

Description of Deficiency

Field buffer cards (6N193-1) in the Solid-State Control System (SSCS) are vendor-supplied by Consolidated Controls Corporation, Bethel, Connecticut. The card has application in both safety-related and nonsafety-related systems, but component cards between the two can be used interchangeably. Some field buffer cards had been experiencing failures with capacitors on the cards, resulting in card failures. The capacitor's failure was found to be caused by a large inrush current resulting from insertion of the cards into a powered cabinet.

Safety Implications

Because the cards are used primarily to "interrogate" valve positions (i.e., determine open or closed), failure of the cards could result in unreliable logic element control. This situation could affect the safety of operations of the plant.

Corrective Action

Site inspections were accomplished, and all cards which had discrepancies were identified.

Although only the 6N193 printed circuit boards were covered in NCR 1309, all the electronic subassemblies used in the SSCS for Bellefonte units 1 and 2 were analyzed.

A different style capacitor (tantalum electrolytic) has been used and a current limiting resistor added to eliminate further failures. Removal of capacitors, which were evaluated as unnecessary to circuit function, was also implemented. Such is the case in the 6N191, 6N193, and 6N196 cards.

As a result of their analysis, the vendor (Consolidated Controls Corporation) is undertaking an extensive rework program on the 6N191, 6N193, and 6N196 cards, and they provided TVA with an engineering report detailing their findings on the failures December 17, 1981. All rework is expected to be completed and all cards returned to the plant site by August 1, 1982.

This condition does not affect any other TVA plant as the SSCS is unique only to the Bellefonte Nuclear Plant.