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

June 3, 1982

BLRD-50-438/81-32
BLRD-50-439/81-35

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 - CONSOLIDATED CONTROL CORPORATION FIELD BUFFER CARDS - BLRD-50-438/81-32, BLRD-50-439/81-35 - REVISED FINAL REPORT

The subject deficiency was initially reported to NRC-OIE Inspector R. W. Wright on December 3, 1980 in accordance with 10 CFR 50.55(e) as NCR 1296. This was followed by our interim reports dated January 1, May 21, and July 8, 1981 and our final report dated December 30, 1981. As discussed with Inspector R. V. Crlenjak by telephone on May 19, 1982, enclosed is our revised final report. The reason for the revision is that the date for completion of the corrective action indicated in our final report on this matter will not be met. The vendor has informed TVA that there will be a two-month delay in the the anticipated date of completion because of the complexity of the repairs required. 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

D S Kammer

for L. M. Mills, Manager
Nuclear Licensing

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

OFFICIAL COPY

IE 27

ENCLOSURE
BELLEFONTE NUCLEAR PLANT UNITS 1 AND 2
CONSOLIDATED CONTROL CORPORATION FIELD BUFFER CARDS
BLRD-50-438/81-32, BLRD-50-439/81-35
10 CFR 50.55(e)
REVISED FINAL REPORT

Description of Deficiency

Field buffer cards (6N193-1) in the Solid-State Control System (SSCS) are vendor-supplied by Consolidated Control Corporation (CCC). 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 have been found with electrical shorts between inputs of separate channels and others have had pins which were not soldered. The electrical shorts on the cards appear to have been caused by solder defects between pins.

The defects noted on the cards were caused by several factors; CCC QC standards were not properly implemented resulting in deficient trend-type analysis which is used to detect problem areas; CCC personnel were not consistently used in their area of expertise; and CCC manufacturing personnel required training in basic skills such as wire wrapping, soldering, etc. The deficiencies went undetected primarily due to the lack of a computer operational test before leaving the factory.

Safety Implications

Electrical shorts on the 6N193-1 field buffer cards could result in loss of power to essential instrumentation and control (I&C) systems. Although evaluations have shown that a loss of only one channel of I&C can be acceptable, the subject condition could result in common mode failure of several safety-related systems which could adversly affect the safe operation of the plant.

Corrective Action

All applicable manufacturing procedures, test procedures, and drawings have been revised to assure that component changes, test functions, and operating characteristics, including all necessary marking modifications have been implemented. CCC Quality Standards for soldering and visual acceptance criteria have been revised to enforce improved process controls. A specific rework "Inspection Check List" has been originated and is now used to evaluate the acceptability of the reworked modules. This inspection check list denotes the acceptance criteria for each module modification including the specific test functions required for each type of modification. As a minimum, each module is visually inspected 100 percent after rework, and each module is subject to an operating test.

CCC has initiated a "Module Handling and Packaging Procedure" KJV7317 to assure protection during shipment to TVA. CCC performed site inspections of all potentially defective modules and all defective modules were shipped back to the vendor's facilities for rework. As of December 1, 1981, 224 reworked 6N193-1 modules have been accepted by TVA Quality Assurance personnel for shipment to Bellefonte site.

The above will continue until all modules have been returned. All modules will be completed and returned to TVA by August 1, 1982.