

TENNESSEE VALLEY AUTHORITY

CHATTANOOGA, TENNESSEE 37401
400 Chestnut Street Tower II

February 4, 1982

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U.S. Nuclear Regulatory Commission
Region II
ATTN: James P. O'Reilly, Regional Administrator
101 Marietta Street, Suite 3100
Atlanta, Georgia 30303

Dear Mr. O'Reilly:

50-518

HARTSVILLE AND PHIPPS BEND NUCLEAR PLANTS - REPORTABLE DEFICIENCY -
INCORRECT ROOT FACE ON SKEWED CADWELD SLEEVES (NCR'S HTN CEB 80-04,
PBN CEB 80-04; FORMALLY NCR CEB 80-11) - REVISED FINAL REPORT

Initial notification of the subject deficiency was made to NRC-OIE,
Region II, Inspector R. W. Wright on March 14, 1980. The final
report was submitted on June 19, 1980. In accordance with paragraph
50.55(e) of 10 CFR Part 50, we are enclosing our revised final
report on the subject deficiency. This revised report is being
submitted in response to the request made by B. R. Crowley, NRC-OIE,
Region II, as documented in Phipps Bend Inspection Report Nos.
50-553/81-01 and 50-554/81-01. We consider 10 CFR Part 21
applicable to this nonconformance. If you have any questions,
please get in touch with Jim Domer at FTS 858-2725.

Very truly yours,

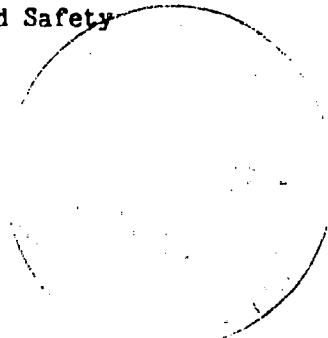
TENNESSEE VALLEY AUTHORITY

L. N. Mills

L. N. Mills, Manager
Nuclear Regulation and Safety

Enclosure

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



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ENCLOSURE
HARTSVILLE NUCLEAR PLANTS A AND B AND PHIPPS BEND NUCLEAR PLANT
INCORRECT ROOT FACE ON SKEWED CADWELD SLEEVES
10CFR50.55(e) REPORT NO. 3 (REVISED FINAL)
WCRs HTNCEB8004 AND PBNCEB8004

Description of Deficiency

The design of the drywell framed embedments and main steam tunnel embedments requires cadweld sleeves to be welded to the embedments at an angle of 45 degrees (skewed). The designer, GE/CFBraun, San Jose, California, specified a No. 18 cadweld on design drawings for the skewed cadweld sleeves mentioned above. The designer incorrectly assumed that the 1/16" root face achieved in a No. 18 perpendicular cadweld, would also be achieved in a No. 18 skewed cadweld. It was later determined that the root face on No. 18 skewed cadwelds actually varied from 3/32" to 1/2". Due to this dimensional discrepancy in the root face, it was felt that the proper weld penetration was not achieved.

Safety Implications

The cadweld sleeves have been approved for use by GE/CFBraun (see corrective action). It has been shown that the welds on cadweld sleeves with a 1/2" (worst case) root face are adequate. Therefore, this condition could not have adversely affected plant safety.

Corrective Action

The cadweld sleeves to be used in future fabrications have been delivered to Atlas. Atlas fabricated some representative structures using the same welding processes used for structures already fabricated and sleeves with the worst case root face (1/2"). A destructive pull test was performed on nine sample structures, three tests for each of the three welding procedures used. The structures pulled were made of two counterposed skewed cadweld sleeves, both welded to an A572 V55, 1-1/2" plate (see page 2, "Test Results for Cadweld Qualifications").

GE/CFBraun reviewed the test results (see page 2) and the weld geometry calculations. Based on this evaluation, they determined that the cadwelds are acceptable to use as-is. To prevent recurrence of this deficiency, CFBraun design drawings have been revised to require that the weld of the cadweld sleeve to attaching member develop an ultimate strength equivalent to 75 KSI in the rebar.

TEST RESULTS FOR CADWELD QUALIFICATION

Test Plate No.	#18 Rebar Bar Stress (KSI)
1	95
2	93.75
3	95.5
4	103.1
5	94.5
6	107.75
7	110.6
8	110
9	109

No welds failed during this test. All failures were in the bar, except that test number 4 did not go to actual failure due to overheating of the test machine. The minimum bar stress to be met is 75 KSI. Three tests were conducted for each of the three welding procedures used.