TENNESSEE VALLEY AUTHORITY
CHATTANOOGA, TENNESSEE 37401

1630 Chestnut Street Tower II

85 JUL 29 P1:19

July 23, 1985

BLRD-50-438/83-56
BLRD-50-439/83-49

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 - MASS OF HVAC SUPPORTS NOT INCLUDED IN FREQUENCY CALCULATIONS - BLRD-50-438/83-56, BLRD-50-439/83-49 - FINAL REPORT

The subject deficiency was initially reported to NRC-OIE Inspector P. E. Fredrickson on October 20, 1983 in accordance with 10 CFR 50.55(e) as NCR BLN BLP 8336. This was followed by our interim reports dated November 18, 1983, May 15, 1984, and February 27, 1985. Enclosed is our final report.

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

Very truly yours,

TENNESSEE VALLEY AUTHORITY

J. A. Domer
for J. W. Hufham, Manager
Licensing and Risk Protection

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

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ENCLOSURE

BELLEFONTE NUCLEAR PLANT UNITS 1 AND 2
MASS OF HEATING, VENTILATING, AND AIR-CONDITIONING SUPPORTS
NOT INCLUDED IN FREQUENCY CALCULATIONS
BLRD-50-438/83-56, BLRD-50-439/83-49
NCR BLN BLP 8336
10 CFR 50.55(e)
FINAL REPORT

Description of Deficiency

Bellefonte Nuclear Plant (BLN) Design Criteria N4-50-D716, section 8.1, requires that the mass of a support be included in the evaluation of the natural frequency of that support in the restrained direction when the support's mass is greater than 50 percent of the supported mass. A review of heating, ventilating, and air-conditioning (HVAC) support calculations initiated to address generic concerns of the separately reported item, nonconformance report (NCR) WBN SWP 8254 (CDR 390/83-48 and 391/83-46), has revealed that some supports identified in the TVA design drawing series listed below were not designed to criteria requirements.

The affected drawing series are:

4AW0867-X2	4AW0871-X2
4AW0868-X2	4AW0865-X2
4AW0869-X2	4AW0759-X2
4AW0870-X2	4AW0532-X2

TVA has determined that the cause of this deficiency was the ambiguous and misleading wording of section 8.1. In the second paragraph of this section, two methods of designing duct supports (the allowable stress limit and the status deflection limit methods) are listed while the third paragraph discusses considerations used in the status deflection limit method only. This paragraph contains the statement, "the weight of the support need not be considered unless it is estimated to be 50 percent or more of supported ducts weights." Since there was no mention of the weight of the support being included in calculations using the allowable stress limit, it was reasoned in some instances that such an inclusion was not required.

Safety Implications

A continued failure to include support mass into natural frequency evaluations as required could result in support anchor loads or structural members exceeding design allowances. This in turn could have caused support failures which degraded safety-related duct to the extent that safe operation of the plant could be adversely affected.

Corrective Action

All duct supports in category I structures were investigated to determine if the support mass had been included in the design. Some supports were designed without the use of the support's mass in its design, but in each such case the conservatism of the support's design was sufficient to allow the inclusion of the support mass without requiring any modification.

To prevent a recurrence of this problem, design criteria N4-50-D716 has been revised to clearly indicate that the mass of the support must be included in both the stress limit and the deflection limit methods for designing duct supports in a category I structure and to clearly distinguish between the two methods.

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