

TENNESSEE VALLEY AUTHORITY

CHATTANOOGA, TENNESSEE 37401

5N 157B Lookout Place

MAY 19 1988

U.S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, D.C. 20555

Gentlemen:

In the Matter of)	Docket Nos. 50-259
Tennessee Valley Authority)	50-260
)	50-296

BROWNS FERRY NUCLEAR PLANT (BFN) UNITS 1, 2, AND 3 - NRC INSPECTION REPORT NOS. 50-259/86-56, 50-260/86-56, AND 50-296/86-56, - SUPPLEMENTAL RESPONSE

This letter contains a supplemental response to EA 86-56, Item I.A. Since October 8, 1986, when TVA's original response was forwarded, TVA has identified inadequacies in the design control of cable tray loading at BFN. The BFN senior resident inspector was informed of the problem in November.

Enclosure 1 provides TVA's supplemental response. Enclosure 2 provides a list of commitments.

If you have any questions, please telephone David Skridulis at (205) 729-2070.

Very truly yours,

TENNESSEE VALLEY AUTHORITY

R. Gridley
R. Gridley, Director
Nuclear Licensing and
Regulatory Affairs

Enclosures
cc: See page 2

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U.S. Nuclear Regulatory Commission

MAY 19 1988

cc (Enclosures):

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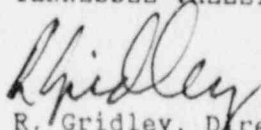
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ENCLOSURE 1

SUPPLEMENTAL RESPONSE
NRC ENFORCEMENT ACTION
NO. 50-259/86-56, 50-260/86-56, AND 50-296/86-56
LETTER FROM DR. J. NELSON GRACE TO S. A. WHITE
DATED SEPTEMBER 8, 1986

Item I.A.

Technical Specification 5.6, Seismic Criteria, specifies that station Class I structures and systems are designed to withstand a design basis earthquake. 10 CFR Part 50, Appendix B, Criterion III, Design Control, requires that measures be established to assure that applicable requirements are correctly translated into specifications, drawings, procedures, and instructions and that these measures include provisions to assure that appropriate quality standards are specified and included in design documents. These design control measures must also provide for verifying or checking the adequacy of the design.

Contrary to the above, as of the NRC inspection conducted August 12 - 16, 1985, design discrepancies existed that indicated that some of the cable tray supports in areas of the Control Bay, Diesel Generator and Reactor Buildings, station Class I structures or systems, were not adequately designed to withstand a design basis earthquake and may not have been able to perform their intended function during a seismic event. In addition, a number of design calculations used to qualify many of the typical cable tray supports were not checked or verified.

Original Response

1. Admission or Denial of the Alleged Violation

TVA does not contest the violation.

2. Reasons for the Violation

Inadequate design controls resulted in a failure to coordinate design requirements within and between engineering disciplines. This lack of design control also resulted in engineering calculations which were not adequately prepared nor properly documented.

3. Corrective Steps Which Have Been Taken and Results Achieved

Nuclear Engineering Procedures (NEP), were issued in July 1986. The stringent NEPs place rigorous controls on the design process of cable tray systems in the following areas:

- NEP 3.1, Engineering Calculations
- NEP 3.2, Design Input
- NEP 3.3, Interface Control
- NEP 5.1, Design Output
- NEP 5.2, Review and Design Verification
- NEP 6.1, Change Control

The result of the NEPs is a closely controlled design process which will ensure the adequate design and verification of seismic qualification of cable tray support systems.

In order to ensure that engineering personnel are qualified to perform design activities on cable tray systems, periodic training in all pertinent documents and procedures is required. Individual training records are maintained for each person to ensure that the latest requirements or revisions to documents are made known. Periodic internal audits are conducted to verify training and design compliance.

The following discussion outlines seismic cable tray programs which are being implemented to (1) allow restart and safe operation of unit 2 and (2) provide seismic qualification of cable trays for all three Browns Ferry Nuclear Plant (BFN) units. These two programs have taken into consideration the overfilled cable trays specified in violation I.B.(1.).

1. To verify that cable tray supports are adequate to allow restart and interim operation of unit 2, TVA contracted United Engineers and Contractors (UE&C) to perform an interim seismic qualification of the unit 2 cable tray system. UE&C issued a formal report containing support qualification calculations and modifications required before unit 2 restart. This report is presently under review by NRC. Those modifications identified will be completed before restart of unit 2.
2. For the long-term resolution of cable tray integrity BFN is planning to use the methodology of NUREG-1030 which was developed to resolve Unresolved Safety Issue A-46, Seismic Qualification of Equipment in Operating Nuclear Power Plants. This method of resolution, jointly developed by NRC and the Seismic Qualification Utility Group (SQUG), uses the results of damage surveys conducted in conventional power plants and industrial facilities which have experienced actual earthquake ground motions.

The surveys show that nonnuclear grade equipment similar to that in nuclear plants, including cable trays, is seismically rugged in general and does not fail under seismic loading. Direct comparison, using qualification criteria jointly developed by NRC SQUG, will be used to show long-term qualification of BFN cable trays.

TVA contracted Earthquake Engineering (EQE) to evaluate all BFN cable trays for the long-term resolution of concerns regarding the integrity of cable tray supports under seismic loading. Based on preliminary results of EQE's review, all BFN cable trays would withstand design basis seismic events without modification and continue to function normally.

4. Corrective Steps Which Will Be Taken to Avoid Further Violations

The Nuclear Performance Plan (NPP), Volume 1 provides the actions being implemented at the corporate level to avoid the root cause of inadequate design control. The actions related to the improvement in the design control process for BFN are contained in the NPP, Volume 3. Specific corrective steps for this issue are:

- a. The cable tray modifications for unit 2 will be completed using the interim seismic qualification.
- b. The long-term qualification of cable trays will be completed using the methodology of NUREG 1030 to resolve Unresolved Safety Issue A-46, Seismic Qualification of Equipment in Operating Nuclear Power Plants.

5. Date When Full Compliance Will Be Achieved

Seismic qualification (including any modifications required) of the unit cable tray systems or common cable tray systems needed to support the units will be accomplished before their respective startup dates.

Supplemental Response

Condition Adverse to Quality Reports (CAQR) initiated in June 1987 identified the fact that the design control of cable tray loading after the August 1985 UE&C seismic qualification report was not adequate.

UE&C evaluated the cable trays and supports for the as found condition as of August 1985 but did not account for the weight of cables for design complete modifications which were in progress or which would be worked before unit 2 restart. The design controls, that engineering had in place to ensure that the addition of cables on such modifications would not invalidate UE&C's seismic qualification, were inadequate.

As a result of these CAQRs, engineering placed an interim restraint on the BFN modifications and maintenance organizations on cable pulling in seismic structures. A written release is required from engineering before cable may be pulled. BFN will issue, as a supplement to the NEPs, project specific design controls to ensure adequate control of cable pulling. These design controls will be in place by July 15, 1988. Engineering will evaluate those cable trays that have had cable added since issuance of the UE&C report to ensure that those cable trays and supports remain qualified based on the acceptance criteria. This evaluation will be completed by August 1, 1988.

ASURE 2

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ENT ACTION NO.
36-56, AND 50-296/86-56
SON GRACE TO S. A. WHITE
MBER 8, 1986

OMMITMENTS

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ENCLOSURE 2

SUPPLEMENTAL RESPONSE
NRC ENFORCEMENT ACTION NO.
50-259/86-56, 50-260/86-56, AND 50-296/86-56
LETTER FROM DR. J. NELSON GRACE TO S. A. WHITE
DATED SEPTEMBER 8, 1986

LIST OF COMMITMENTS

Engineering will evaluate those cable trays that have had cable added since issuance of the UE&C report to ensure that those cable trays and supports remain qualified based on the acceptance criteria. This evaluation will be completed by August 1, 1988.

Engineering will issue project specific design controls, on cable pulling, by July 15, 1988.