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

February 22, 1985

Director of Nuclear Reactor Regulation
Attention: Ms. E. Adensam, Chief
Licensing Branch No. 4
Division of Licensing
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

Dear Ms. Adensam:

In the Matter of the Application of) Docket Nos. 50-390
Tennessee Valley Authority 50-391

Please refer to TVA's letter to you dated May 17, 1984 responding to T. M. Novak's letter to H. G. Parris dated April 25, 1984 concerning seismic and dynamic qualification of safety-related electrical and mechanical equipment. The Staff, in section 3.10 of the Watts Bar (WBN) Supplemental Safety Evaluation Report (SSER) 3, expressed additional concerns regarding this issue.

Enclosed is TVA's response to these items. Please note that TVA intends to submit results of the in situ test of the main control room panel assembly by May 3, 1985.

If you have any questions concerning this matter, please get in touch with K. Mali at FTS 858-2682.

Very truly yours,

TENNESSEE VALLEY AUTHORITY

J. W. Hufham, Manager
Licensing and Regulations

Sworn to and subscribed before me
this 22nd day of Feb. 1985.

Paulette N. White
Notary Public

My Commission Expires 8-24-88

Enclosure
cc: U.S. Nuclear Regulatory Commission (Enclosure)
Region II
Attn: Dr. J. Nelson Grace, Regional Administrator
101 Marietta Street, NW, Suite 2900
Atlanta, Georgia 30323

A048
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ENCLOSURE

WATTS BAR NUCLEAR PLANT
SEISMIC AND DYNAMIC QUALIFICATION
OF SAFETY-RELATED ELECTRICAL AND MECHANICAL EQUIPMENT

Section 3.10.1(1)

The response to the envelopment in the letter from TVA to the NRC dated May 17, 1984, did not indicate that the Seismic Qualification Review Team forms for all safety-related equipment supplied by Westinghouse were provided. To be acceptable, the response must address the concerns for all safety-related equipment supplied by Westinghouse.

TVA's Response

Following the issue of IEEE 344-1975, and NRC's Regulatory Guide 1.100, Westinghouse conducted an extensive seismic reevaluation program to demonstrate qualification of its nuclear steam supply system (NSSS) equipment against the multi-frequency/multi-axis test requirements of the 1975 standard. This generic program included the full scope of Watts Bar Nuclear Plant (WBN) NSSS equipment; TVA reviewed the Westinghouse program to confirm that the generic levels envelope the WBN-specific seismic requirements. The Westinghouse program was thoroughly audited by NRC's Mechanical Engineering Branch, Division of Systems Safety. NRC's acceptance of the program as having satisfactorily resolved the multi-frequency/multi-axis concern is indicated in NRC memorandum from J. P. Knight to R. C. DeYoung dated August 26, 1976.

In preparation for the WBN equipment seismic qualification audit, the NRC audit team was provided with a complete list of all safety-related equipment. It was agreed that from this total listing of NSSS and balance-of-plant (BOP) equipment, a sampling of specific items of equipment would be defined by the audit team for more detailed evaluation. During the audit, the concern regarding the compliance of NSSS equipment with the multi-axis/multi-frequency test requirements arose again for the specific items of equipment being audited in detail. In order to fully resolve this concern, and in effect, to provide verification of the earlier generic resolution, detailed information was provided to demonstrate qualification of the audited NSSS equipment consistant with IEEE 344-1975 and Regulatory Guide 1.100.

As noted in supplement 3 to the WBN SER, the NRC Staff has now accepted the TVA/Westinghouse responses for the audited NSSS equipment. However, the Staff has now requested that the concern listed in section 3.10.1(1) of supplement 3 be addressed for all safety-related equipment supplied by Westinghouse. Based on the results of the Westinghouse seismic evaluation program discussed above and the detailed evaluations conducted as part of the WBN Seismic Qualification Review Team audit, it is our conclusion that the findings from these programs adequately represent the seismic qualification status of this equipment. The TVA/Westinghouse position remains that all of the NSSS items of equipment are appropriately qualified to current standards, as demonstrated both on a generic basis and verified by specific examples. As such, we believe that the responses supplied by TVA and Westinghouse have adequately responded to the NRC Staff's concern.

Section 3.10.1(3)

The applicant was requested to demonstrate by in situ tests on a WBN cabinet that the response of the cabinet is essentially unaffected by the difference in mounting. In a June 10, 1983, submittal, TVA asserted that the base steel assemblies used to mount cabinets are rigid and that the weld-versus bolted configuration would result in a very small difference in equipment seismic response. By letter dated May 17, 1984, the applicant reiterated his position. Since no new information has been presented, the request for an in situ test is still felt appropriate. Discussion under equipment-specific item 5, "Main Control Board," in section 3.10.2 is pertinent for resolution of this issue.

TVA Response

See response to question 3.10.2(5)(a).

Section 3.10.1(4)

Many safety-related equipment items, such as the insulation of motors, transformers, and other electric devices, are age sensitive with respect to their seismic performance. To ensure that safety-related equipment is seismic resistant throughout the plant life, a detailed program of surveillance and maintenance should be provided for Staff review and approval.

The applicant's submittal of May 17, 1984, did not address the equipment located in a mild environment.

TVA Response

The WBN surveillance and preventative maintenance program that includes qualification-mandated equipment and component replacement requirements for safety-related electrical equipment conforms to the guidance contained in ANS 3.2/ANSI-N18.7-1976, "Administrative Controls and Quality Assurance for the Operational Phase of Nuclear Power Plants." The program is based on technical specification requirements, manufacturer's information, qualification program results, and TVA operating experience and is developed by plant personnel. Implementation of this program is through plant procedures. Various activities are included in this program such as channel calibration, channel checks, equipment performance tests, valve lineup tests, emergency safety feature (ESF) actuation tests, equipment lubrication and maintenance, and equipment mechanical vibration studies. This program also facilitates ongoing reviews of equipment performance, and as such, the surveillance and preventative maintenance procedures can be continually updated based on experience.

In addition to the plant-specific program described above, TVA has implemented an Operating Experience Review Program that monitors safety significant issues including equipment performance. This program considers not only the operating experience from five other operating TVA nuclear units, but also overall nuclear industry experience via information mechanisms such as NRC IE Bulletins and Information Notices and INPO SERs and SQERs.

Section 3.10.2(1)(a)

The applicant was requested to demonstrate that the welded field mounting is structurally as sound as the bolted lab mounting. Resolution of this item relies on the response to item 3 in section 3.10.1 and will be evaluated under that generic issue.

TVA's Response

Question 3.10.1(3) refers to the resolution of question 3.10.2(5)(a). See response to question 3.10.2(5)(a).

Section 3.10.2(2)(a)

The applicant was asked to demonstrate that field mounting is as adequate as lab mounting. Resolution relies on the response to item 3 in section 3.10.1 and will be evaluated under that generic issue.

TVA's Response

Question 3.10.1.(3) refers to the resolution of question 3.10.2(5)(a). See response to question 3.10.2(5)(a).

Section 3.10.2(2)(c)

The applicant was requested to evaluate the degree of amplification that occurred in the cabinet response motion during tests to clearly justify single-frequency testing. The applicant replied by referring to his response to item 1 in section 3.10.1. The applicant also stated the that RRS, when peak broadened by 10 percent, is still enveloped by the TRS. Resolution of this item relies on a satisfactory response to item 1 in section 3.10.1 and will be evaluated under that generic issue.

TVA's Response

See response to question 3.10.1(1)

Seciton 3.10.2(5)(a)

An in situ test of the control board is requested to gain a measure of confidence for the minimum horizontal natural frequency of the board. Such a test could also close generic concern No. 3.

TVA's Response

TVA agrees to perform the in situ test of the main control room panel assembly as requested by NRC. The purpose of the test will be to demonstrate that the anchorage configuration, (intermittent welds along outside edge of sill channel) does not introduce additional flexibility to cause a significant reduction in the 1st mode natural frequency of 14.3 Hz. The tentative schedule calls for the test to be conducted during middle to late February 1985, with documentation of test results to follow within approximately 60 days. The test results will be provided to NRC no later than May 3, 1985.

Section 3.10.2(13)(b)

Demonstrate, using the unbroadened spectra, that multimodal response is not possible. The fact that the response spectra had been broadened does not, by itself, ensure that the unbroadened spectra will not generate multimodal response.

TVA's Response

The attached diesel generator building spectra are applicable to seismic qualification of the Barksdale pressure switch. These floor response spectra were enveloped and broadened to establish the broadened RRS provided in the May 17, 1984 submittal. By inspection, it is obvious that this is a classic example of the floor response spectrum being dominated by a single frequency spike. As recognized in IEEE 344-1975, this response spectrum characteristic precludes the possibility of any significant multimodal response.