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AUG 22 1991

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

Gentlemen:

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

WATTS BAR NUCLEAR PLANT (WBN) UNITS 1 AND 2 - REVISED RESPONSE TO NRC
REQUEST FOR ADDITIONAL INFORMATION (RAI) ON NRC SUPPLEMENTAL SAFETY
EVALUATION REPORT (SSER) 6 OUTSTANDING ISSUE 4(a) - EQUIPMENT SEISMIC
QUALIFICATION

Reference: TVA Response letter to USNRC Document Control Desk, Responses
to Requests for Additional Information on NRC's review of WBN
FSAR Amendments 54 through 64, May 8, 1991

In the referenced correspondence, TVA responded to an NRC concern
relative to equipment qualification requirements at Watts Bar.
Enclosure 4, page 2 of 4 of the referenced letter, noted that Category I
electrical and mechanical equipment was seismically qualified either in
direct compliance with the IEEE standard 344-1975/Regulatory Guide 1.100,
or in accordance with a program which provided as a minimum,
qualification to the requirements of IEEE 344-1971 and in addition
addressed certain guidelines of SRP 3.10.

In subsequent communications with the staff, the NRC questioned the
intent of that final condition whereby, as a minimum, only certain
guidelines of SRP 3.10 were satisfied.

By Enclosure 1 to this letter, TVA wishes to clarify this statement.
Accordingly, page 2 of 4 in Enclosure 4 of the referenced letter should
be replaced by Enclosure 1. This rewrite clearly indicates that the
alternate qualification method is to the requirements of IEEE 344-1971
and in addition addresses the guidelines of SRP 3.10.

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U.S. Nuclear Regulatory Commission

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This clarification is also being incorporated into the applicable FSAR Section 3.7.3.16, as evidenced by the marked-up attachment, Enclosure 2.

If you have any questions, please telephone P. L. Pace at (615) 365-1824.

Very truly yours,

TENNESSEE VALLEY AUTHORITY


John H. Garrity

Enclosures

cc (Enclosures):

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ENCLOSURE 1

REVISED RESPONSE TO NRC
REQUEST FOR ADDITIONAL INFORMATION (RAI)
EQUIPMENT SEISMIC QUALIFICATION

The following page replaces page 2 of 4 of Enclosure 4 in TVA's response letter to USNRC Document Control Desk, "Responses to Requests for Additional Information on NRC's review of WBN FSAR Amendments 54 through 64," dated May 8, 1991.

The Watts Bar Category I electrical and mechanical equipment seismic qualification program is consistent with the guidance provided by the NRC Standard Review Plan (NUREG-0800), Revision 2, July 1981, Section 3.10, acceptance criteria for plants with CP applications docketed before October 27, 1972. The equipment has been seismically qualified either in direct compliance with IEEE STD 344-1975/Regulatory Guide 1.100 (equipment procured after September 1, 1974), or in accordance with a program which provided as a minimum, qualification to the requirements of IEEE 344-71 and in addition addressed the guidelines of SRP 3.10.

TVA's program for seismic qualification of Watts Bar equipment relative to the procedures of 344-1975 was first discussed with NRC in September 1976, References 1 and 2. TVA's discussion of its efforts to ensure compliance with current criteria included:

1. Commitment to early implementation of new criteria, and discussion of steps taken toward this end, e.g., updated seismic qualification requirements for equipment purchased after September 1, 1974.
2. Discussion of engineering rationale, citing specific examples, leading to the generic conclusion that for equipment purchased prior to September 1974, TVA's implementation of the IEEE 344-1971 test procedures was sufficiently conservative to more than adequately envelop the effects of multi-mode/multi-axis seismic excitation.

Since this first meeting, there has been a continuing dialogue with NRC regarding the adequacy of TVA's seismic qualification program. This dialogue is reflected in the WBN FSAR 112 series of questions and answers, culminating in question 112.33, its answer, and related correspondence in References 3, 4 and 5. The result of this discussion was that NRC would conduct a SQRT review of certain NSSS and non-NSSS equipment at Watts Bar. NRC indicated in question 112.33 that the Watts Bar NSSS equipment had already been reviewed on a generic basis but applicability to Watts Bar needed to be determined.

The site audit was conducted in April, 1982, with the objective, as stated in the SER (Reference 6 and 7), to resolve the concern as to the extent to which the WBN equipment seismic qualification program satisfied IEEE 344-1975, Regulatory Guide 1.100, and the guidelines of SRP 3.10. The results of the site audit were documented in NRC's letter to TVA dated September 23, 1982.

ENCLOSURE 2

REVISED RESPONSE TO NRC
REQUEST FOR ADDITIONAL INFORMATION (RAI)
EQUIPMENT SEISMIC QUALIFICATION
MARKED UP FSAR PAGES

Bar spectra by a considerable margin and therefore, the loads for the four loop generic analysis envelope the loads for Watts Bar. Consequently, seismic qualification of the Watts Bar reactor internals is demonstrated since the four loop reactor internals have been qualified on a generic basis.

3.7.3.15 Analysis Procedure for Damping

The specific percentage of critical damping value used for Category I structures, systems, and components are provided in Tables 3.7-2 and 3.7-24. | 64

3.7.3.16 Seismic Analysis and Qualification of Category I Equipment Other Than NSSS

All seismic Category I floor or wall-mounted mechanical and electrical equipment was analyzed or tested and designed to withstand seismic loadings in the horizontal and vertical directions. The floor response spectra obtained from the analysis of structures were used in the analyses. Each procurement specification for equipment contained the particular floor response spectra curve for the floor on which the equipment is located. Depending on the relative rigidity and/or the complexity of the equipment being analyzed, the vendor could use one of the following four methods to qualify the equipment: | 64

1. Dynamic analysis method,
2. Simplified dynamic analysis method,
3. Equivalent static load method,
4. Testing method.

The basis used for selection of the appropriate accelerations used in the above paragraph is described in further detail in Section 3.7.3.16.2. Table 3.7-25 identifies how each seismic Category I item was initially qualified. | 64

Equipment is considered to be rigid for seismic design if the first natural frequency is equal to or more than 33 cycles per second.

←----- Insert from Page 2 of 2 | 64

3.7.3.16.1 Dynamic Analysis Method For Equipment and Components

Equipment that is rigid and rigidly attached to its support structure was analyzed for a g-loading equal to the acceleration of the supporting structure at the appropriate elevation.

For nonrigid, structurally simple equipment, the dynamic model consisted of one mass and one spring. Keeping the values of the mass and the spring constant, the natural period of the equipment

INSERT TO SECTION 3.7.3.16

The Watts Bar Category I electrical and mechanical equipment seismic qualification program is consistent with the guidance provided by the NRC Standard Review Plan (NUREG-0800), Revision 2, July 1981, Section 3.10, acceptance criteria for plants with CP applications docketed before October 27, 1971. The equipment has been seismically qualified either in direct compliance with IEEE Std. 344-1975/Regulatory Guide 1.100 (equipment procured after September 1, 1974), or in accordance with a program which provided as a minimum, qualification to the requirements of IEEE 344-1971 and in addition addressed the guidelines of SRP 3.10.