

50-344SP

PORTLAND GENERAL ELECTRIC COMPANY
121 S. W. SALMON STREET
PORTLAND, OREGON 97204

D. J. BROCK
AND STAFF



October 17, 1978

Director of Nuclear Reactor Regulation
ATTN: Mr. A. Schwencer, Chief
Operating Reactors Branch #1
Division of Operating Reactors
U. S. Nuclear Regulatory Commission
Washington, D. C. 20555

Dear Sir:

Attached is the response to an NRC Staff question based on information provided by Bechtel in confirmation of telephone conversations between Portland General Electric Co., Bechtel, and NRC Staff on October 16, 1978.

This letter and attachments are being served on the Atomic Safety Licensing Board and all parties in the Control Building Proceeding.

Sincerely,

DJB:cw
Attachments



RESPONSE TO NRC STAFF TECHNICAL QUESTION
October 16, 1978

QUESTION

Indicate what frequency ranges (considering the ranges between linear and nonlinear behavior) of the response spectra anomalies between the original analysis and the STARDYNE analysis are inferred from the STARDYNE results. What are the magnitudes of the peaks which may exist? (Include a firm basis.) Verify that these are the only ranges in which anomalies are predicted. Verify that if significant peaks were to occur in these ranges, they would be enveloped by the original equipment qualification spectra. Identify any safety-related components, equipment, piping, and systems (i.e., those required to prevent an accident or mitigate the consequences of an accident so as to assure that off-site releases exceeding Part 100 guidelines will not occur, such as ECCS and safe shutdown equipment) which would exceed license criteria if these anomalies exist. Verify that any modification to these pieces of equipment will be performed prior to resumption of operation to assure that they are in compliance with license criteria in spite of these anomalies. The entire complex (Control, Auxiliary, and Fuel Buildings) must be addressed in your response, considering both the N-S and E-W directions.

RESPONSE

The frequency ranges at which anomalies in the floor response spectra of the entire complex between the original and the STARDYNE (linear-elastic) analysis may be inferred from the STARDYNE results are at the STARDYNE frequencies. These frequencies are 6.8, 9.5, and 12.1 cps for the N-S direction; and 8.6, 12.1, and 12.6 cps for the E-W direction.

Considering the possible inelastic behavior of the Control Building in the N-S direction under the SSE condition, the extreme lower bound frequencies that the Control Building floor spectral peak frequencies in the N-S direction could shift are, as discussed in the previous response, 3.3, 4.75, and 6.0 cps respectively corresponding to the 6.8, 9.5, and 12.1 cps STARDYNE linear-elastic frequencies. The floor spectral peak magnitudes associated with the 3.3 cps was discussed in the previous response. The floor spectral peaks associated with 4.75 and 6.0 cps would be within the original Control Building N-S floor spectral peak magnitudes. The possible inelastic behavior of the Control Building in the N-S direction is not expected to have a significant effect on the Control

Building E-W response and the response of the Auxiliary and Fuel Buildings in the E-W and N-S direction.

Conservative response spectra have been estimated for preliminary use by amplifying the modal acceleration at a given location associated with each mode by the maximum amplification derived from the original floor response spectra at that location. These amplifications are based on a simplified method and will be confirmed or modified by further analysis.

The range of anomalies discussed above is the expected range of possible significant differences between the original and STARDYNE analyses and this will be verified by further analysis.

We have reviewed the effect of spectrum response shifts on the previously qualified safety-related systems, components, and equipment in the Control-Auxiliary-Fuel Building Complex. It has been determined that such effects will be minimal and will generally not require modifications to previously qualified equipment, or to electrical or piping systems. In some cases, modifications may be required to requalify piping, but such modifications are not expected to be extensive.

The equipment is generally qualified in the "rigid" frequency range with frequencies above significant higher mode influences. Electrical cable trays also appear to be qualified for a broader spectrum that would envelope these spectrum shifts.

Certain piping systems above el 45 ft will be affected and may require more detailed analysis. We have identified component cooling water and service water system piping which will require additional restraints to shift their respective natural frequencies beyond the range of significant higher mode frequencies. These few additional restraints will be installed before plant operation begins.

An additional review will be made of all safety-related components, equipment, and piping systems in the Building Complex to assure that any significant change in spectrum response will not adversely affect the operation of equipment or systems required to safely shut the plant down or to mitigate the consequences of an accident so as to assure that off-site releases exceeding Part 100 guidelines will not occur.

The effect of the anomalies identified above upon the safety-related components, equipment, piping, and systems required to prevent an accident or mitigate the consequences of an accident is under continued investigation. In cases where the response spectra anomalies indicate noncompliance with the seismic design criteria of the operating license, suitable modifi-

cations or requalification will be performed to re-establish the original license requirements prior to resumption of plant operation. This verification applies to all such identified equipment located above of 45 ft in the Control, Fuel, and Auxiliary Building Complex.

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION



BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

In the Matter of)
) Docket 50-344
PORTLAND GENERAL ELECTRIC COMPANY,)
et al) (Control Building Proceeding)
)
(Trojan Nuclear Plant))

CERTIFICATE OF SERVICE

I hereby certify that on October 17, 1978:

- 1) Licensee's letter to Director of Nuclear Reactor Regulation, dated October 17, 1978, forwarding a response to the NRC Staff question received October 16, 1978, and
- 2) Letter of J. R. Gray, Counsel for NRC Staff, dated October 16, 1978, forwarding the "Testimony of Kenneth S. Herring, Office of Nuclear Reactor Regulation, Regarding the Supplemental STARDYNE Analysis and Its Effect on the Structural Capacity of the Trojan Control Building"

have been served upon the persons listed below by delivery to a messenger for service or by depositing copies thereof in the United States mail with proper postage affixed for first class mail (except Item 2 above has been served only on those individuals indicated by an asterisk).

Marshall E. Miller, Esq., Chairman
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Washington, D. C. 20555

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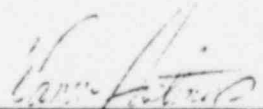
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Portland General Electric Company

Dated: October 17, 1978