Portland General Electric Company

August 20, 1980

Trojan Nuclear Plant
Docket 50-344
License NPF-1

Mr. R. H. Engelken, Director
U. S. Nuclear Regulatory Commission
Region V
Suite 202, Walnut Creek Plaza
1990 N. California Blvd.
Walnut Creek, CA 94596

Dear Sir:

In our July 25, 1980, letter, we stated that finite element analyses were being performed by Bechtel for refinement of interstory displacement multiplication factors originally based on the simplified analytical technique described in the June 28, 1980, submittal. The finite element analyses have now been completed and confirm that the refined displacement multiplication factors are at or below the June 28, 1980 criteria. Results are summarized in Attachment 1 hereto.

In development of LER 79-15 related wall modification designs, we find that the use of conventional reinforced concrete members at some locations presents the most effective means of wall strengthening, and although not previously described as a wall modification alternative, we intend to use this method in at least one location. The design of such reinforced concrete members will be in accordance with the ACI 318-71 Code, using load combinations and allowable stress criteria specified in the Trojan FSAR.

Sincerely,

DJB/TEB/3rc4A26

c: Mr. Robert A. Clark, Chief
Operating Reactors Branch No. 3
Division of Licensing
U. S. Nuclear Regulatory Commission

Mr. Lynn Frank, Director
State of Oregon
Department of Energy

Control Building Service List

A002
S/1

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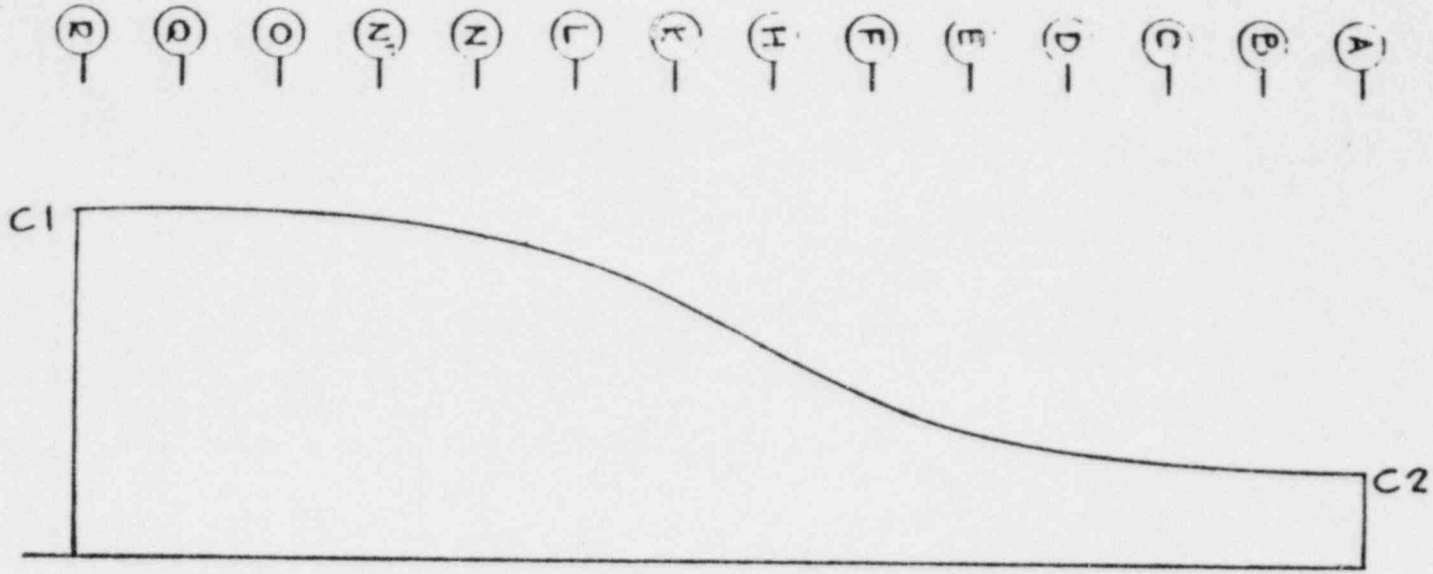
80-223

ATTACHMENT 1

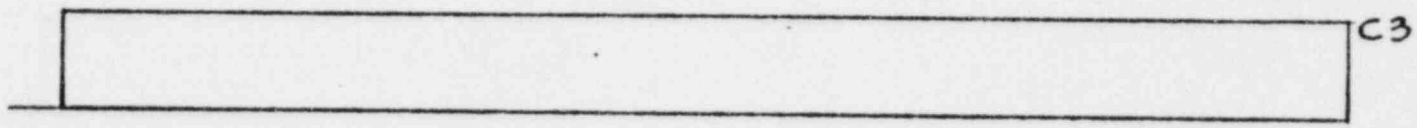
Confirmation of Displacement Multiplication Factor

The evaluation of interstory drift effects on walls of the Control-Auxiliary-Fuel Building Complex was performed with the aid of the displacement multiplication factor shown in Figure 1 of the June 28, 1980 submittal. This displacement multiplication factor was developed in conjunction with the finite element analysis of the unmodified Complex so the effects of gross bending, 10 full SSE stress cycles, three simultaneous components of the earthquake, vertical slip at the encased columns and reduced stiffness due to cracking could be accounted for. The finite element analysis of the unmodified Complex which existed at the time the displacement multiplication factors were first estimated was performed prior to the existence of test data, from the Bechtel shear wall testing program, which provides valves for the reduced stiffness due to cracking.

The finite element analysis has been updated to include the stiffness data from the testing program and the stiffness reduction factors shown in Appendix B of PGE-1020. Using the results from this finite element analysis, an estimate of the additional deflection due to the other effects (gross bending, earthquake cycles, 3-D earthquake, and vertical slip) has been made, resulting in the curves shown in Figure 1. The coefficients C1, C2, and C3 in the table on Figure 1 are based on the previous finite element model of the modified complex for comparitive purposes. The comparison of the values of C1, C2, and C3 demonstrates that the original estimates were conservative.



Displacement Multiplication Factor for North-South Direction, All Elevations.



Displacement Multiplication Factor for East-West Direction, All Elevations.

	Multiplication Factor	
	Prior to F/E Anal.	After F/E Anal.
C1	7.0	4.5
C2	2.0	2.0
C3	2.5	2.0

FIGURE 1 - Displacement Multiplication Factors for the Unmodified Complex