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AUTH. NAME AUTHOR AFFILIATION
CURTIS, N. W. Pennsylvania Power & Light Co.
RECIP. NAME RECIPIENT AFFILIATION
SCHWENCER, A. Licensing Branch 2

SUBJECT: Responds to Structural Engineering Branch questions re vertical dynamic analysis, discussed during 820629 meeting & 0630 telcon. Drawings of diesel generator bldg floor plan & structural steel encl.

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PP&L Pennsylvania Power & Light Company
Two North Ninth Street • Allentown, PA 18101 • 215 / 770-5151

Norman W. Curtis
Vice President-Engineering & Construction-Nuclear
215 / 770-5381

July 2, 1982

Mr. A. Schwencer, Chief
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

SUSQUEHANNA STEAM ELECTRIC STATION
RESPONSE TO NRC REQUEST ON VERTICAL DYNAMIC ANALYSIS
ER 100450 FILE 841-2 Docket Nos. 50-387
PLA-1164 388

Dear Mr. Schwencer:

This letter transmits responses to questions asked by Mr. Norman Romney of the NRC's Structural Engineering Branch during recent meetings between the NRC, PP&L and Bechtel in Bethesda on June 29, 1982 and during a telephone conversation of June 30, 1982. The questions concern the revised vertical dynamic analysis of the Diesel Generator and Control Buildings.

Question 1:

Provide stress margins for representative structural floor members due to the revised analysis of the diesel generator building.

Response:

The maximum increase in peak structural response (ZPA) in the diesel generator building is 25% (.035g) for SSE. The controlling element is the bending stress of the steel beams found in the composite beam floor system. The critical steel beams bending stress for the governing load combination (DL+LL-OBE) has increased to 22.3KSI, versus an allowable of 24KSI. The corresponding concrete stress for the composite beam is 1.0KSI, versus an allowable of 1.66KSI.

Question 2:

In the revised vertical analysis of the diesel generator building the frequency of the floor beam s is calculated assuming fixed end boundary conditions. Justify this assumption.

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Response:

The diesel generator building is divided into four compartments separated by reinforced concrete walls. The composite floor beams span between these walls (clear span 27' - 0"), see Attachment 1.

The floor slab was constructed monolithically with the wall using an unshored construction technique. The slab has steel reinforcing top and bottom. Some of this reinforcing penetrates into the wall, thus, providing continuity. Details of the wall to slab connection are provided in Attachment 2.

The fixed and boundary condition is an appropriate assumption in the dynamic analysis for the following reasons:

- o The moment capacity of the continuous slab prevents joint rotation and relative rotation of the slab on each side of the wall.
- o The design and the construction techniques provide for continuity at the slab/wall interface.
- o The unshored construction results in very small slab stresses at the slab/wall interface; thus, the slab should remain continuous with the wall (i.e. No cracking should occur.) The maximum dynamic load of .14g will result in very low additional stresses.

Question 3:

Provide stress margins for the Control Building floors due to the revised vertical analysis.

Response:

The controlling element is the steel beam bending stress of the composite floor beams. The bending stress due the critical load combination is 29KSI against an allowable of 32KSI. (Reference Attachment V to PLA-1147 dated 6/29/82 page 7.)

Very truly yours,

David P. Moyer/Sr

N.W. Curtis
Vice President - Engineering & Construction - Nuclear

DPM
Attachment

cc: R.L. Perch - NRC