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Director of Nuclear Reactor Regulation
U.S. Nuclear Regulatory Commission
7920 Norfolk Avenue
Bethesda, MD 20814

Attention: Mr. Walter Butler, Chief
Licensing Branch 2
Division of Licensing

Gentlemen:

PLANT UNIQUE ANALYSIS REPORT
HOPE CREEK GENERATING STATION
DOCKET NO. 50-354

Pursuant to our telecon with NRC Containment Systems Branch on May 29, 1985, Public Service Electric and Gas Company hereby submits the following additional information regarding the Hope Creek Generating Station plant unique analysis report hydrodynamic load question responses previously submitted (letter from R. L. Mittl, PSE&G to A. Schwencer, dated 1/31/85):

ITEM 8

How much margin exists for increased torus ring beam submerged structure loads? Do submerged structure loads occur in controlling load combinations?

RESPONSE

The load combinations which produce controlling stresses are the IBA II and IBA III combinations as shown in PUAR Table 2-2.5-3. This load combination includes submerged structure loads due to SRV discharge and chugging as shown in PUAR Table 2-2.2-8 and described in Section 2-2.2.1. The controlling component stresses for these combinations are the ring beam and torus shell local primary membrane stresses and primary plus secondary stress ranges. The margins for these components range from 13% to 37% as shown in PUAR Table 2-2.5-3.

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The margins for increased submerged structure loads are obtained by factoring the stress intensitites due to submerged structure loads and combining these results with the stress intensities for the remaining IBA loadings such that the ratio of calculated to allowable stress is 1.0. Doing so shows that the submerged structure loads could increase by as much as 31%. It is estimated that utilization of SRSS would allow submerged structure load increases of 50% or more.

ITEM 9

What is the basis for ring beam 10% frequency band? How do Hope Creek ring beam frequencies compare with those of other plants?

RESPONSE

The Hope Creek ring beam frequencies are calculated using the improved Rayleigh method. In this method the potential energy (or strain energy) is based on the work done by the applied load rather than by integration of the square of derivatives of an assumed shape function as in the displacement based method. Lateral loads are applied to the submerged portion of the ring beam in the suppression chamber analytical model shown in PUAR Figure 2-2.4-1. The corresponding displacements are used to calculate the work done. The potential energy is therefore evaluated quite accurately using this approach.

The kinetic energy is obtained by computing the summation of $w^2 m_i \delta_i^2$, where m_i is the sum of the nodal ring beam mass and hydrodynamic mass, and δ_i is the nodal deflection due to the applied load. The ring beam frequency is then computed by equating the potential and kinetic energies. The resulting Rayleigh quotient has second order convergence. Therefore it is felt that the 10% band for the ring beam frequencies is adequate.

The section modules of the Hope Creek ring beams and torus shell thickness are generally greater than those of other Mark I plants. The Hope Creek ring beams have lateral stiffeners at intermediate locations which act to shorten the effective span of the ring beam sections. The resulting Hope Creek ring beam frequencies therefore are somewhat higher than those of most other Mark I plants as expected.

Should you have any questions in this regard, do not hesitate to contact us.

Very truly yours,

C D. H. Wagner
USNRC Licensing Project Manager
A. R. Blough
USNRC Senior Resident Inspector

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