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August 15, 1979

Mr. Boyce H. Grier, Director
Office of Inspection and Enforcement
U. S. Nuclear Regulatory Commission
Region 1
631 Park Avenue
King of Prussia, Pennsylvania 19406

Dear Mr. Grier:

NRC IE BULLETIN NO. 79-07
SEISMIC STRESS ANALYSIS OF SAFETY-RELATED PIPING
NO. 1 AND 2 UNITS
HOPE CREEK GENERATING STATION

In reply to IE Bulletin No. 79-07 dated April 14, 1979, we offer the following response:

A review of the seismic analysis computer programs has been completed for safety-related piping at Hope Creek. In all cases, appropriate combinational methods and adequate program verifications were used.

Future vendor-supplied seismic analysis will be controlled by a general specification covering seismic qualification. This specification requires the contractor to use either the square root sum of the squares or closely spaced modes combinational methods. Also, the contractor is required to provide documentation of the method of analysis, names of programs, and method of verification.

A summary of all seismic analysis performed or awarded to date is listed below.

Program Description and Verification

The combinational method for Bechtel Power Corporation's computer program ME 632 (Seismic Analysis of Piping Systems) and ME 101 LEAP (Liner Elastic Analysis of Pipe) is the square root sum of the squares.

ME 632 was verified against PISOL, PIPEED, and TPIPE.
ME 101 was verified against ME 632, TPIPE, and SUPERPIPE.

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The computer program PISTAR was used to analyze the safety relief valve discharge piping within the torus. The combinational method was the square root sum of the squares and closely spaced modes per NRC Regulatory Guide 1.92. PISTAR was verified against ANSYS and hand calculated Problem No. 6 of the ASME Pressure Vessels and Piping Code (1972 Computer Program Verification).

General Electric used the computerized piping analyses SAP4G and PISYS for the nuclear steam supply system at Hope Creek. These programs employed the square root sum of the squares combinational method. SAP4G was verified against ANSYS (Swanson Systems) and special GE benchmark problems. PISYS was verified against SAP and five (5) NRC benchmark problems to be submitted to the NRC for review by July 31, 1979.

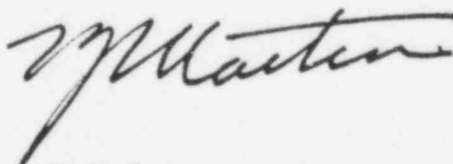
No computerized programs were used for the piping analysis of Ingersoll-Rand's safety auxiliary cooling system. Pipe support distances were hand calculated using the square root sum of the squares combinational method.

Colt Industries/Fairbanks Morse Engine Division manufactured Hope Creek's standby diesel generators. Structural Dynamic Research Corporation of Milford, Ohio supplied the program packages SAGS, DAGS, and DAGSMIC for the above diesel piping. The combinational method was the square root sum of the squares and closely spaced modes per NRC Regulatory Guide 1.92, revision 1. These programs were verified by the Structural Dynamic Research Corporation of Milford, Ohio. The DAGS program calculated natural frequencies that agreed with theoretical frequencies.

Description and verification of the computer programs SAGS and DAGSMIC have not been supplied by Colt Industries as of July 1979. When this information is received from Colt Industries, PSE&G will forward this description and verification to the NRC.

Should additional information be desired, we will be pleased to further discuss it with you.

Very truly yours,



CC: Office of Inspection and Enforcement
Division of Reactor Construction Inspection
Washington, D. C.