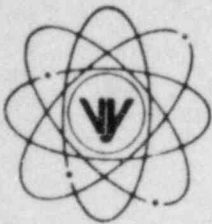


VERMONT YANKEE NUCLEAR POWER CORPORATION



RD 5, Box 169, Ferry Road, Brattleboro, VT 05301

REPLY TO:
ENGINEERING OFFICE

1671 WORCESTER ROAD
FRAMINGHAM, MASSACHUSETTS 01701
TELEPHONE 617-872-8100

May 14, 1985

FVY 85-43

United States Nuclear Regulatory Commission
Washington, D. C. 20555

Attention: Office of Nuclear Reactor Regulation
Mr. Domenic B. Vassallo, Chief
Operating Reactors Branch No. 2
Division of Licensing

References: (a) License No. DPR-28 (Docket No. 50-271)
(b) VY Letter FVY 85-36, dated April 22, 1985

Subject: Request For Approval of PVRC Damping Analysis Method

Dear Sir:

Vermont Yankee herein requests approval of the use of Pressure Vessel Research Committee (PVRC) recommended damping values for response spectrum seismic piping analysis at Vermont Yankee. We are requesting the use of these values per ASME Code Case N-411 as promulgated by the Main Committee on June 28, 1984, and previously approved by NRC for use at other nuclear facilities.

It is our intention to apply these values to the replacement of the recirculation system and portions of the Residual Heat Removal (RHR) System at Vermont Yankee. By letter dated April 22, 1985, [Reference (b)], we submitted a description and scope of Vermont Yankee's program for replacement of the recirculation system piping and notified you of our intention to perform the pipe stress analysis using PVRC damping in accordance with ASME Code Case N-411. Attachment 1 to this letter provides the documentation necessary for your review and approval of PVRC damping values at Vermont Yankee for the recirculation system pipe replacement program.

Because your review and approval could potentially impact the schedule for our recirculation pipe replacement to be performed during our next outage scheduled to start September 1985, your expeditious review of this request would be greatly appreciated.

Very truly yours,

8505170308 850514
PDR ADOCK 05000271
P PDR

VERMONT YANKEE NUCLEAR POWER CORPORATION

R. W. Capstick
R. W. Capstick
Licensing Engineer

RWC/dps
Attachment

*Acc'd
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ATTACHMENT 1

The horizontal seismic input for the original recirculation system was based on non-peak broadened reactor building amplified response spectra. The vertical input was based on two-thirds of the ground zero period acceleration.

For the replacement system, a coupled structural model containing the reactor building, drywell, reactor pedestal, reactor vessel and reactor internals was developed. The amplified response spectra were developed utilizing USNRC Regulatory Guides 1.60, 1.61, 1.92, and 1.122. For the analysis of piping systems, the damping requirements of ASME Code Case N-411 ("PVRC Damping") are being used.

Fifteen percent peak broadening and full consideration of horizontal and vertical structural amplification was employed.

The original plant design basis utilized the N69W component of the 1952 Taft earthquake normalized to 0.07g for the operating basis earthquake and 0.14g for the safe shutdown earthquake. Five percent structural damping was assumed for concrete structures for both the OBE and the SSE. One-half (1/2%) percent damping was assumed for piping for both the OBE and the SSE.

The replacement system seismic input is based on USNRC Regulatory Guide 1.60, normalized to 0.07g for the OBE and 0.14g for the SSE. As stated above, structural damping as specified in USNRC Regulatory Guide 1.61 was utilized. The Regulatory Guide 1.60 ground spectra were determined to be conservative with respect to the original seismic design basis.

For the piping system analysis, the B31.1 Power Piping Code was used for both the original and the replacement systems.

Seismic load combination for the original system was based upon a two-directional earthquake. The replacement system analysis utilizes a three directional earthquake. The cutoff frequency for the original design was 20 Hz. For the replacement system, the cutoff frequency is 33 Hz.

We have significantly increased the basic conservatism of the seismic analysis to be consistent with current regulatory approaches. In addition, by utilizing the Code Case N-411, we have been able to more realistically predict piping behavior. Acceptance criteria will ensure that adequate clearance exists to allow for all piping displacements.

The recirculation system stress analysis is currently underway. We are in the final stages of verification prior to issuing the support system drawings. The results of our analyses, to date, indicate that reductions in the number of snubbers on the Recirculation and RHR Systems is possible. Our analysis, which incorporates PVRC damping, reduces the number of supports required, more accurately reflects expected piping performance during seismic events, and reduces overall personnel exposures in installation, maintenance, and surveillance.