

COMMENTS ON DRAFT REGULATORY GUIDE DG-1157
DAMPING VALUES FOR SEISMIC DESIGN OF NUCLEAR POWER PLANTS

ASME Code Section III Appendix N contains the ASME recommended guidance on damping of piping systems. The Appendix recommends 5% damping for both OBE and SSE, for all frequencies and pipe sizes. The recommendations are based on the work of the ASME Special Working Group on Damping, which cited testing done by Bechtel. Linear regression analysis of the test data resulted in damping values that range between 5.0 and 8.0 percent for Service Level D, and 4.0% to 7.0% for Service Level B, depending on the pipe size. 5% was selected as a conservative average. 5% damping was the basis for the reduction of the EPRI/GE test data used in formulating the new seismic analysis criteria first published in the 1995 Edition of the ASME Code.

The Draft Regulatory Guide, as written, specifies 4% damping for SSE and 3% for OBE. The annulled Code Case N-411 damping is allowed as an alternative for SSE only. If these damping levels are used, it will result in the OBE case limiting the design of the piping, requiring more snubbers and pipe whip restraints.

In developing the revised seismic rules of NB-3656, the allowable stress levels were determined by fitting the test data assuming 5% damping. If lower damping is now required, the resulting safety margins of the piping system design will be higher than the safety margins agreed upon by the NRC and the ASME. In order to have seismic design criteria consistent with the agreed upon safety margins, the Service Level D stress allowables need to be increased, and/or the B₂' stress indices decreased.

Submitted by Paul Hirschberg
Chairman, ASME Working Group on Piping

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Case = J.T. Yarekum (STX)
J. O'Connor (SCD)
J. Redjely (SNR)
D. Yehres (HLGI)