

EFFECT OF WELD DUCTILITY ON HIGH FREQUENCY SEISMIC RESPONSE

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Under high frequency seismic excitation the ductility of power plant equipment base welds, while involving relatively small displacements (typically 0.25 mm or 0.1 inch), can significantly reduce the dynamic response of the equipment as compared to a linear response prediction. This effect can allow recognition of margins as great as 50% on the high frequency portions of typical seismic spectra. This paper presents an analytical model and computational approach to quantify this phenomena, and presents shake table data useful in verifying this concept. This approach is useful in margins studies and in the evaluation of seismic events with particularly large high frequency energy (such as those in the eastern United States).