

Seismic Design and Evaluation of Concrete Dams – An Engineering Manual

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ABSTRACT

This paper provides an overview of the US Army Corps of Engineers' guidance for seismic design and evaluation of concrete dams, as presented in the Engineer Manual EM1110-2-6053. The requirements to design and evaluate concrete dams to have a predictable performance for specified levels of seismic hazard are discussed. The seismic input and performance levels associated with serviceability, damage control, and collapse prevention are defined. The analysis and evaluation procedures and acceptance criteria for each performance level are described. They consist of linear and nonlinear procedures for estimation of seismic response and acceptance criteria that use demand-capacity ratios, damage control thresholds, and irrecoverable level of movements and post-earthquake stability condition to assess dam safety. Finally, an example is provided to demonstrate the application of the manual to seismic evaluation of a concrete gravity dam.

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Presented at the 39th US-Japan Joint Meeting of the Panel on Wind and Seismic Effects, Tsukuba, Japan, 14-19 May 2007.