

PROBABILISTIC APPROACH APPLIED FOR BREZINA CONCRETEWEIGHT ARCH DAM

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Abstract:

This article target is to perform a probabilistic analysis of a concrete dam. Brezina weight arch dam situated at El Bayedh in Algeria is chosen as a case study. Ansys code is used for three-dimensional finite element modeling of the dam. Input variables are generated arbitrary by Monte Carlo (MCS) method which is more precise but costly in terms of computing time. Simulation number privileged in this method (MCS method) is in order of 500 simulations chosen based on convergence of results (of responses). Normal and Log-Normal distributions laws are used to generate random variables; young Modulus (E) and density (). The bandwidth limits are 38.14Hz and 42.15Hz. It represent frequency margin whose resonance risk is very high. This bandwidth has been determined from a determinist study which is a numerical modal analysis using Ansys code. The obtained results show that the variation coefficient of E and for Brezina concrete weight arch dam hasn't an impact on the dam security whose resonance risk is almost neglected. Results also confirm that the mean frequency value for the two distribution laws cases (Normal and Log-Normal) stay practically stable. So, we can conclude that the concrete weight arch dam object of the present study is safe for different values of E and

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