

Abstract

The safety of a dam can be estimated by techniques of analysis of the risk, it takes into account estimations of the risk associated with the system of dam-reservoir. For that purpose, it is important to quantify the probability of failure for several failure modes. This thesis makes the probability estimation of a more current failure mode in dams; it is the failure in the sliding for a gravity concrete dam. The main idea of this thesis is to analyze the estimation of the probability of failure of existing dams in the sliding for various events of load by using methods of reliability and techniques of simulation.

The thesis concerns a methodology to estimate the probability of failure of gravity concrete dam in sliding along the interface dam-foundation with three cases of exploitations; normal case, exceptional case and extreme case for two various conditions of drainage. A method of calculation of reliability (level 2), it bases) on Taylor's approximation and another method (level 3) by Monte Carlo simulations. Conclusions are pulled at the end by comparing the results obtained from a code of calculation of probability of failure.

Keywords: Gravity dam - sliding - probabilistic - failure - Reliability - Monte Carlo simulations - *FORM* and *SORM* methods – CADAM.