# Application Reliability Method for Concrete Dams

**Authors :** Mustapha Kamel Mihoubi, Mohamed Essadik Kerkar

**Abstract :** Probabilistic risk analysis models are used to provide a better understanding of the reliability and structural failure of works, including when calculating the stability of large structures to a major risk in the event of an accident or breakdown. This work is interested in the study of the probability of failure of concrete dams through the application of reliability analysis methods including the methods used in engineering. It is in our case, the use of level 2 methods via the study limit state. Hence, the probability of product failures is estimated by analytical methods of the type first order risk method (FORM) and the second order risk method (SORM). By way of comparison, a level three method was used which generates a full analysis of the problem and involves an integration of the probability density function of random variables extended to the field of security using the Monte Carlo simulation method. Taking into account the change in stress following load combinations: normal, exceptional and extreme acting on the dam, calculation of the results obtained have provided acceptable failure probability values which largely corroborate the theory, in fact, the probability of failure tends to increase with increasing load intensities, thus causing a significant decrease in strength, shear forces then induce a shift that threatens the reliability of the structure by intolerable values of the probability of product failures. Especially, in case the increase of uplift in a hypothetical default of the drainage system.

**Keywords :** dam, failure, limit-state, monte-carlo, reliability, probability, simulation, sliding, taylor

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