

Mecano-Reliability Approach Applied to a Water Storage Tank Placed on Ground

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Abstract : Traditionally, the dimensioning of storage tanks is conducted with a deterministic approach based on partial coefficients of safety. These coefficients are applied to take into account the uncertainties related to hazards on properties of materials used and applied loads. However, the use of these safety factors in the design process does not assure an optimal and reliable solution and can sometimes lead to a lack of robustness of the structure. The reliability theory based on a probabilistic formulation of constructions safety can respond in an adapted manner. It allows constructing a modelling in which uncertain data are represented by random variables, and therefore allows a better appreciation of safety margins with confidence indicators. The work presented in this paper consists of a mecano-reliability analysis of a concrete storage tank placed on ground. The classical method of Monte Carlo simulation is used to evaluate the failure probability of concrete tank by considering the seismic acceleration as random variable.

Keywords : reliability approach, storage tanks, monte carlo simulation, seismic acceleration

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