

# Application of the Direct Optimized Probabilistic Calculation

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## Abstract

The objective of this paper is to indicate the current scope which might be covered by the new method - Direct Optimized Probabilistic Calculation ("DOProC") in assessments of reliability of load carrying structures. DOProC uses a purely numerical approach without any simulation techniques. This provides more accurate solutions to probabilistic tasks, and, in some cases, such approach results in considerably faster completion of computations. DOProC can be used now to solve efficiently a number of probabilistic computations.

One part of theoretical science and practice according probabilistic concept of DOProC method is focused into the probabilistic calculation of fatigue crack propagation of steel structures and bridges under fatigue stress. Solution leads to the probabilities of three basic random events in dependence on years of structure's operation and fatigue crack propagation. On the basis of that calculation for each individual year, determined by analysis of reliability function, the dependence of the failure probability on time of the bridge's operation is specified. When the limit reliability is known, it is possible to determine times of the structure's inspections using conditional probability.

## References

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