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**Time-variant reliability-based structural optimization using SORM.** (English) Zbl 0972.90019  
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Summary: Structural optimization under time-invariant reliability constraints is sufficiently well known. The same problem under time-dependent loads and resistances has not yet found satisfying solutions. Recently, a new attempt has been made where structural reliability is determined by the outcrossing approach in the context of first-order reliability methodology. In the paper an algorithm is designed with which outcrossing rates determined by asymptotic second-order reliability methods can be used as constraints in structural optimization. The method is developed for two different types of stationary load models, rectangular wave renewal processes and Gaussian processes, respectively. An example application demonstrates the new methodology.

**MSC:**

**90B25** Reliability, availability, maintenance, inspection in operations research Cited in 9 Documents

**Keywords:**

reliability-orientaed structural optimization; time-invariant and time-variant structural reliability; random processes; outcrossing rates; one-level optimization

**Software:**

NLPQL

**Full Text:** [DOI](#)

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