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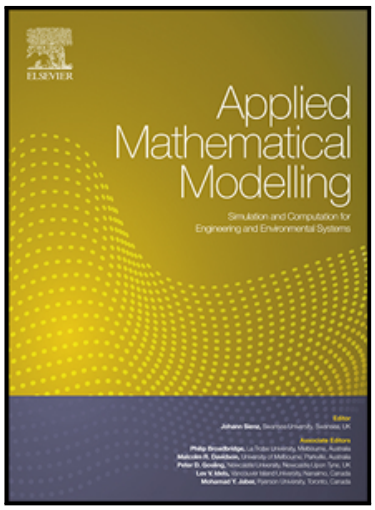


# Reliability evaluation based on a dependent two-stage failure process with competing failures

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# Reliability evaluation based on a dependent two-stage failure process with competing failures

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Highlights

The scientific contribution of this paper to existing literature on reliability modelling and engineering practice is as follows.

- A novel dependent two-stage failure process model is introduced by considering the shared external shocks;
- The impact of shocks on the two-stage failure process is characterized via the random hazard rate increment;
- Multiple failure criterions for systems subject to two-stage failure process are considered;
- Explicit analytical expression for system reliability is derived based on the stochastic failure model;
- An illustrative example of oil pipeline systems is presented to validate the application of the reliability model.

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**Abstract**

This paper evaluates system reliability performance based on a dependent two-stage failure process with competing failures. **The failure process of the system can be divided into two stages, i.e., the defect initialization stage, and the defect development stage. Dependence between these two stages is reflected**

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