

Structural System Reliability-Based Design Optimization Considering Fatigue Limit State

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ABSTRACT

This study incorporates the Branch-and-Bound method employing system reliability Bounds, which is a failure-path structural system reliability analysis approach and termed the B³ method, with a metaheuristic optimization algorithm, namely grey wolf optimization, to obtain the optimal design of structures under fatigue-induced system failure. An additional bounding rule is proposed in the SRBDO against fatigue using the B³ method. This framework is applied to a three-dimensional tripod jacket structure. The proposed method can allocate limited materials throughout the structure efficiently so that the optimally-designed structure has a relatively large number of failure paths with similar failure probability (Biton and Lee, Under Review).

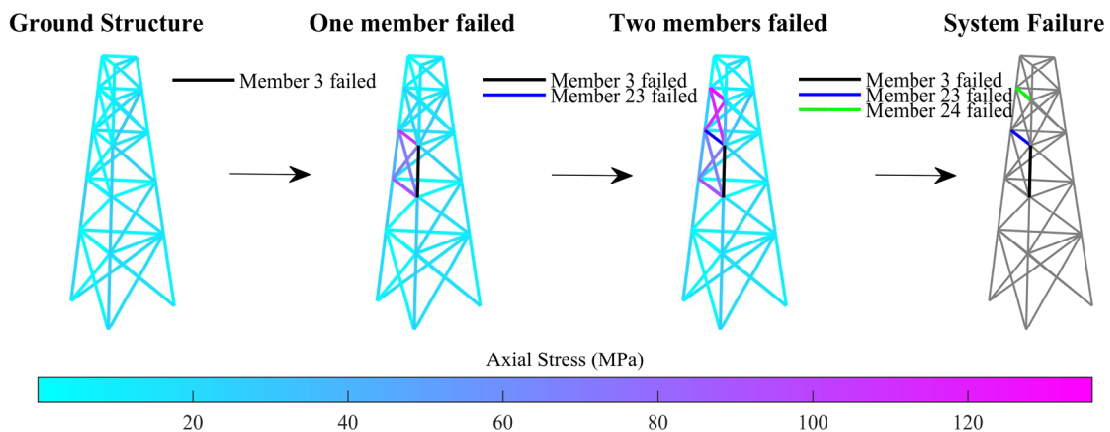


Fig. 1 Sequential failure of offshore tripod structure

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REFERENCES

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