

Interactive comment on “Reliability-based design optimization of offshore wind turbine support structures using analytical sensitivities and factorized uncertainty modeling” by Lars Einar S. Stieng and Michael Muskulus

Anonymous Referee #2

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This paper presents an efficient methodology for reliability-based design optimisation by decoupling the reliability analysis from the design optimisation. The methodology is applied to several different cases based on a uniform cantilever beam and the OC3 monopile and different loading and constraints scenarios. The results have demonstrated the viability of the proposed method.

Specific comments are as follows.

1. Introduction: It would be appropriate to include a paragraph to review the available

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optimisation algorithms and justify the choice of gradient-based optimisation used in this study.

2. Methodology: It would be appropriate to add a flowchart of the proposed framework for RBDO of OWT support structures.

For the constraints, please justify why other constraints, such as buckling and vibration (frequency), are not considered in this study.

3. Testing and implementation details: Lack of case studies to validate the key components of the RBDO framework, e.g. the finite element model.

Part of the OC3 monopile is actually embedded into the soil. The soil-structure interaction can significantly affect the structural performance of the monopile. Please justify why the soil is not considered in this study.

Please clarify how the loads were applied, and clarify if the wave loads are updated with the change of diameters during the optimisation process.

4. Results: Results are presented well.

5. Further discussion: Informative discussion is presented.

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