

Interactive comment on “Reducing the number of load cases for fatigue damage assessment of offshore wind turbine support structures by a simple severity-based sampling method” by Lars Einar S. Stieng and Michael Muskulus

J. Häfele (Referee)

j.haeefe@isd.uni-hannover.de

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This manuscript addresses a common problem in structural design of structures for offshore wind turbines, where the computational costs for FLS structural code checks are high. In general: Good work! The proposed approach is straightforward and the paper is well-written. I also believe that this work is relevant to practical applications. From my point of view, the following points can be strengthened or discussed, respectively:

- Page 2, line 2: "Furthermore, a fundamental assumption for this method is that
- C1

the relative fatigue response to each load case remains approximately constant for an extended family of related support structure designs" - This is indeed a fundamental assumption and it is shown that it is valid under the given boundaries for the given (NREL 5MW) turbine. However, it is important to highlight that this may be invalid for a different turbine (due to severe resonance effects, for instance).

- Subsection 2.4: Needs (minor) improvement concerning description of load assumptions, i.e., how does your wave spectrum look like or how do you model the current?
- Subsection 2.4: Can you elaborate a bit more on your "elements" or your structural model, respectively? I am actually not familiar with Fedem and I guess I am not the only one, so can you provide some more details?

From my point of view, the manuscript can be recommended for publication, when these points have been addressed.

Some minor remarks:

- It may increase the quality of the paper, when you use the same font style in all figures.
- Page 8, line 4: "has been quantified"?
- Page 14, line 27: "state-of-the-art approaches".
- In your references list, try being consistent: Either "Jason Jonkman" or "Jason M. Jonkman".
- References from DNV GL: Particularly the first one is antiquated. Take these: <https://rules.dnvgl.com/docs/pdf/DNVGL/RP/2016-04/DNVGL-RP-C203.pdf> (RP-

C203), <http://rules.dnvgl.com/docs/pdf/DNV/codes/docs/2016-04/Os-J101.pdf>
(OS-J101).

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