

wes-2024-68: Added value of site load measurements in probabilistic lifetime extension: a Lillgrund case study

Author response to the reviewer comment letter:

We truly appreciate the initial detailed comments from the reviewer. These comments not only led to pronounced improvements in the work and its presentation but also made our view wider on future possible work. Below are the remaining minor comments of the reviewer (in black) with our replies (in blue). All the comments are also addressed in the final revision of the paper.

The paper has improved substantially in clarity and completeness of discussion, but technical depth remains limited in some areas. I recommend minor revision focusing on:

• **Assessment of the Frandsen based results:** The lifetime extension assessment using the Frandsen model is strongly influenced by the performance of the generic aeroelastic simulation model. Therefore, the statement that Frandsen yields conservative results may mean one of the following:

- It appears conservative despite the aeroelastic model underestimating loads in freestream conditions.
- It appears conservative partly because the aeroelastic model overestimates loads in freestream conditions.
- Only if the aeroelastic model perfectly matches measurements in freestream conditions can conservativeness be attributed solely to the Frandsen turbulence estimation.

Clarifying this would improve the conclusions made in the article.

Thank you very much for your comment. The statement highlighted in yellow is true in this case. This is now clarified in the discussions (lines #463-464) and conclusion (lines #529-530).

• **Validation representation:** box plots or summary statistics (at least for plots A1 and B1) would improve credibility and understanding of the aeroelastic model performance (instead of or in addition to these point clouds)

Table A1 represents the statistics mentioned. Unfortunately, the full data is no longer available for addressing other forms of statistics. However, a clear reference to this table is now made in line #464 in the discussion to address both this comment and the previous one.

• **Figure 3: Turbulence measure clarification needed:** Is Turbulence given as standard deviation (m/s) of the wind speed for 10-min bins?

Yes. This is clarified by including the unit (m/s) both in the figure's caption and in the 'y' axis label.

Additional to the changes asked for by the reviewer, a full final review has been conducted resulting in some refinement and corrections in the text. In addition:

- A point is added to the discussion about the uncertainty of fitting (lines #478 and #513).
- Two descriptive sentences are added in lines #446 as well as #459.

A tracked-change pdf of the article is attached showing all changes.