

The reviewer strongly believes that the paper presents insights into Investigating Grease Behaviour in Tilted Double-Row Tapered Roller Bearing Installed in Wind Turbine by Developing a Full-Scale Multi-Phase CFD Mode. The detailed comments on methodology, results interpretation, and presentation follow below:

Page 1: Abstract: Are the grease and air phases assumed to be incompressible throughout?

Page 1: Introduction: The opening paragraph is not necessary in the overall scheme of the work? Go directly to the main work

Page 2: Introduction: the word “used to carry higher radial and axial loads...” needs to be quantified. This is beneficial to support the last statement in this paragraph which states “Therefore, double-row TRB are most commonly used as main bearing in wind turbines to support these high loads and provide better mechanical integrity”.

Page 2: Introduction: the statement uses it, redundantly by saying “It supports loads in multiple direction” ... the word “it” becomes unclear. Need to be more specific whether it refers to a double-row or single-row

Page 2: Introduction: General comments. You write with no general quantification made for models comparison. Revisit this aspect. This is a general comment.

Page 2: Introduction: A few statements are unclear, and paragraphs are general too wordy to arrive at a conclusion. For instance, the paragraph that started with “Eco-friendly and sustainable developments...”, is too wordy. Reviewer was lost in the idea the paragraph sought to achieve.

Page 2: Introduction: The reviewer strongly believes that the chosen operating conditions (grease fill ratios, tilt angle, rotational speed) need justification, cite industry standards or typical wind-turbine practice.

Page 3: Introduction: From Hoeprich (2005) the author needs to provide details on grease type, fill ratio, and how grease-film thickness was measured.

Page 3: Introduction: The introductory section is not properly concluded. A standard journal-writing practice is to end with a “paper organization” paragraph that outlines the content of each subsequent section.

Page 4: CFD Model Development: The author must substantiate the use of a 0.98 scale factor. This may not be the most appropriate method. Consider instead referencing a “0.68 mm gap between roller and raceway,” as it directly links geometry to lubrication film thickness.

Page 3: CFD Model Development: Clearly included the boundary conditions. This is a 360 degrees rotating model, so wondering how the BCs were imposed.

Page 4: CFD Model Development: Report key parameters and stats of the half sector mesh.

Page 5: CFD Model Development: In addition, justify the hexahedra structure. Not just by providing figure. For instance, will the grid converge? You can report a quick test for instance, “We double the cell count in the film gap and observe < 2 % change in torque.”

Page 5: CFD Model Development: This is more of a technical question, but if storing 12.5 million points in MATLAB creates memory issues, explain how it was achieved. Did you use a cluster model? If so, document RAM usage and runtime of the MATLAB script for the 12.5M-cell mesh.

Page 6,7&8: CFD Model Development: So many details are written as if the reader is an expert user of OpenFOAM. So, free the journal of jargons.

Page 8: CFD Model Development: In Fig 5, annotate each patch in the caption with its BC type. This helps readers match colors to physical conditions without looking at Fig 4.

Page 6-13: CFD Model Development: This section contains many typos. For example, “appropriated BCs” in Section 2.4 should be “appropriate BCs.” Also, ensure tense consistency—the writing should be in past tense throughout.

Page 13: Simulated Operating Conditions: Never seen a section as short as Section 3 before. That is why, a clear concluding paragraph with a concise “paper organization” in the introduction would have helped you to keep all text tidy and simple to follow. In addition, you would recall that I mentioned, the cluster earlier. Why not move this entire section 3 to the paragraph and just provide more details.

Page 6-13: Results and Discussion – Greases Distribution: The reviewer does not agree to this statement “This phenomenon is attributed to the influence of gravity”. Other factors, such as rotation, are likely involved. Consider rewording to: “primarily due to gravity under rotation and tilt,” unless more evidence is provided.

Page 13-18: Results and Discussion – Greases Distribution: Glad, now!!! Because the volume comparisons are valuable. Consider consolidating into a table, also instead of 0.0347001 m<sup>3</sup>, consider reducing the precision to 0.035 m<sup>3</sup>

Page 13-18: Results and Discussion – Greases Distribution: Figure 12 Panels: There are four subplots (a)–(d); ensure your text refers to each with consistent naming (e.g. “Fig. 12(a)” rather than “Figure 12a”).

Page 13-18: Results and Discussion – Greases Distribution: Your explanation that the stationary outer raceway starves is valid. consider adding a brief note on how cage geometry or gap width exacerbates this.

Page 13-18: Results and Discussion – Greases Distribution: Several captions lack full stops and unit annotations; ensure consistency

Page 18-20: Results and Discussion – Fluxes: update some sign convention for clarity. You may define positive and negative axial directions (e.g. “positive axial velocity is toward the bearing bore”).

Page 18-20: Results and Discussion – Fluxes: Discuss further on how the pumping effect might mitigate grease starvation at the top raceway under certain fill ratios.

Page 18-20: Results and Discussion – Pressure Fields and Grease Settling Behaviour: In Section 4.3 you immediately mention Fig. 17, but the text doesn’t specify which panel (a), (b), or (c) corresponds to which fill ratio. Make it explicit: “Fig. 17(a) shows 45 %, (b) 35 %, and (c) 21 %.”

Page 18-20: Results and Discussion – Pressure Fields and Grease Settling Behaviour: But then again, you cite Maccioni et al. (2023a) but don’t compare magnitudes. Add “their peak pressures were within 10 % of ours,” to show consistency or highlight differences.

Page 18-20: Results and Discussion – Pressure Fields and Grease Settling Behaviour: for the residual grease, what happens to the remaining 2 %? Discuss whether it remains trapped in pockets somewhere.

Page 18-20: Results and Discussion – Pressure Fields and Grease Settling Behaviour: Again, the first paragraph in 4.4 covers two ideas (setup and results). Cannot be, consider splitting and move text to method and leave corresponding result text in results and discussion.

Page 25: Conclusion: observation the bearing reference code here as “41513219” is not correct, it should be “415132191”.

Overall, this manuscript is not yet suitable for publication because it exhibits (1) methodological gaps that are not fully described (2) structural and numerous typographical errors that hinder readability (3) unsubstantiated claims in literature. Substantial revision is needed.