Wind Energ. Sci. Discuss., referee comment RC2
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Comment on wes-2021-63

Anonymous Referee #2

Referee comment on "Wind turbine drivetrains: state-of-the-art technologies and future development trends" by Amir R. Nejad et al., Wind Energ. Sci. Discuss., https://doi.org/10.5194/wes-2021-63-RC2, 2021

The paper gives an interesting and comprehensive overview of technologies and research related to modern wind power drivetrains. It could elaborate a bit more on drivers for technical developments in the introduction, e.g. how are different regions demanding different solutions (US, EU, China, India, offshore, ...)? - how is logistics impacting future designs? - how will increased need for availability (higher capacity factor) impact future designs?

Hereby specific suggestions for the text:

fig 1 => I would recommend to have in the 1st picture of a paper with a state-of-the-art overview a more typical setup of the drive train => for the picture of a wind turbine with a gearbox, I recommend to use a classical 3- or 4-point suspension setup, not an axle-pin design since this is less common; same for the gearbox picture => I would recommend to use a picture from a typical 3-stage high speed gearbox (from a 3- or 4-point suspension)
2.2 - 25 - it might be good to reference VDMA 23904 as a method to calculate reliability of wind turbine gearboxes
2.2 - 34 - "life-limited only by wear" - it is good to add "which means not driven by loed dependent fatigue"
2.5 - quite a lot of details are described on gear modelling - it would be good to indicate that a lot of gear simulation methods are to predict vibration and consequent noise behaviour, whereas the focus in this overview is mainly on calculating stiffness and stresses during wind turbine load conditions (to assess durability of designs)
p 12 - line 27 - it would be good to explain "digital twin" (or put a reference) since this is a quite broad term
p 13 - line 5 - please explain SCADA (or put a reference)
Table 1 - it would be good to add a reference to the relevant IEC61400 chapter
p 17 - 3.3 - it would be good to dinstinguish between "consumed lifetime" and "remaining lifetime" since they are both used. I would recommend to use "consumed lifetime" as a metric that can be calculated based on existing rating methods, by using actual loads (whereas design loads are used in the development phase); "remaining lifetime" should be the best estimation of how long a component will still survive => here it is senseful to include statistical methods in combination with conditional parameters (temperature, vibrations, ...)
p17 - it would be good to refer to industrial use cases (e.g. Boeye-ZF, Nordmark-SKF

presented at CWD conference 2021)