Review

General comment:

This manuscript presents a simulation-based study on the impact of wake impingement on the main bearing basic rating life across a wind farm using DTU 10 MW turbines. By integrating wind field modeling, turbine loading, and fatigue life assessment, the authors aim to quantify how partial wake conditions reduce main bearing life, both in isolated two-turbine cases and a full wind farm layout. The topic is timely and relevant, addressing an underexplored but important contributor to drivetrain failures in large-scale wind turbines.

The paper is generally well-structured and technically ambitious. It provides useful insight into how wake conditions can lead to significant reductions in basic rating life, and how wind rose shape and wake offset can amplify or mitigate this effect. However, there are a number of technical and methodological concerns that must be addressed. These include inaccuracies in the use of ISO 281 terminology, oversimplified drivetrain assumptions, unclear justifications for input parameters, and inconsistencies in geometries. The comments are as follows:

1. It seems there is a conflict between line 10 and line 19. Is there something missing in your calculation that is not consistent with the literature (Hart et al., 2023; EPRI, 2024) or just simplification in the calculation of the life? Please elaborate on how to correct the sentence in line 10 to resolve this conflict.
2. Line 53 defines rating life as the life that 90 % of the bearing population is expected to attain or exceed. It is not a completely correct definition, and it seems the authors mean basic rating life, L_{10} (ISO 281), by this definition. Keep in mind that with a different a_1, life modification factor for reliability, instead of value 1, different reliability and life will be achieved (Table 12 from ISO 281 standard).
3. In formula 1, the basic dynamic load rating is defined as C_D. Because the formula is intended to be for a radial roller bearing (using 10/3 for p value in L10 formula), it is recommended to stick to the ISO symbols and use C_r instead, which is the basic dynamic radial load rating. I'm not sure if the notation C_D is common in the industry. It is the same with the dynamic equivalent radial load, P_{eq}.
4. In equation 3 the life is defined in the form of different proportions of time spent. Although this definition is not wrong and is used in some references, the L_{10} is originally defined per revolution instead of time spent. Even when you want to sum the different operating conditions, the summation should be done on different numbers of revolutions instead of the time spent. In addition, it is not clear how the lives in revolutions unit changed to years units in the results.
5. In lines 73 to 78, the paper clarified why ISO 281 rating life is used. Strictly speaking, the paper used basic rating life because ISO 281 also proposes another, more advanced rating life named modified rating life, L_{nm}.
6. Line 140 presented the Weibull distribution as a standard model. Although it is true, it is important to say that considering the shape parameter of 2 leads to the Rayleigh distribution, which is a special state of the Weibull distribution, and it is presented in the IEC 61400-1 as well.
7. In the wind turbine simulation section, it is mentioned that the DTU 10 MW is considered; However, DTU 10 MW is a well-known reference wind turbine, it would be better to give some general information about its specification in this section, such as rotor diameter.

8. In Line 181, the axial dimension of the middle of the shaft is presented from the hub. The value is 3.7 m, and if the length between the center of the bearing and to center of the shaft is deducted, the remaining length is 2.7 m (between the center of the front bearing and the center of the hub). According to DTU 10 MW specifications, the hub diameter is 5.6 m, which leads to 2.8 m in radius. Even with a main shaft-hub connection diameter of 3 meters, the length between the center of the hub and the shaft-hub connection would be 2.36 m, and there is only 0.34 m for the distance between the center of the front bearing and the shaft-hub connection. This value is so unrealistic.
9. In line 191, it is presented that the weighing is equal across all time steps. Does the turbine rotate at a constant speed? Otherwise, how can such an assumption be justified? If this is not the case, please clarify what the assumption means.
10. The information about the bearings is limited to lines 186 to 193 and table 1. Please provide more details such as type of bearings, general dimensions, Value X and Y (dynamic radial and axial load factors), and manufacturer design code.
11. In line 194, 5D is considered for the downstream distance between turbines. Because this value will be fixed for the whole simulation in parametric analysis, it needs to be referenced and justified.
12. In line 198, three different wind speeds are assumed. None of them are rated or cut-out wind speeds. It is not clear to readers how these wind speeds were chosen.
13. In line 200, it is mentioned that the simulation was 2000 s and 1000 s is discarded. There are two notes in this item. First, what is the reason for doing a 2000-second simulation? To my understanding standard proposes a 10-minute simulation. Second, 1000 s discarding means putting away half of the data. If one discards half of the data, do the turbulence intensity and the characteristics of the wind remain untouched? Please ensure wind field characteristics remain consistent post-discard.
14. In section 3.2, it is not clear what the wind characteristics are. Please include a table describing wind and site conditions.
15. In section 3.3, the questions about simulation time (comment 13) are valid. The questions are more significant for 6 and 8 m/s.
16. In section 3.3, it is not clear what wind characteristics are besides an annual mean wind speed.
17. In Fig. 2b, a matrix of 32 turbines is considered in a symmetric pattern. Because of a symmetric pattern, even with consideration of different flow angles, it seems 16 turbines are enough. Please explain more about using 32 wind turbines and justify this assumption.
18. In Fig. 2b, there is no information about the arrangement and distances of the turbines. Also, out of curiosity, is there any reason to start turbine numbers from 0? It is suggested to add a table of turbine coordinates and naming conventions to make the layout traceable.
19. In line 215, equal weighing is used in rating life for turbulent wind model conditions. How do the authors justify such an assumption by considering variability in shaft speed due to the turbulence regime?
20. According to Fig. 4, the life results for the bearings for both turbines are in a different order. How do the authors describe such a phenomenon? Is the assumption of the taking loads by the front bearing reasonable? It should be noted that the bearings have the same order of radial dynamic load rating, and when the life has a different order, it shows a different order of loads.

21. Interestingly, the trend of the basic rating life of the bearing in the rotor and generator side regarding the wind speed in front turbine is different. The life of the rotor side at 7.5 m/s is higher than 11 m/s. On the other hand, on the generator side, the bearing life at 7.5 m/s is almost half of the other wind speeds. It would be valuable if the authors discussed more about this happening.
22. The results in Fig. 4 show the difference between the life of the bearings in front and back turbines. It would be useful to present the average power in the same figure, as maybe less power is one of the reasons behind the shorter life of the bearings.
23. In line 257, the standard grid spacing claim needs a reference.
24. Please add the illustration of the wind rose used in Fig. 5a. It can be added in Fig.3.
25. In line 267, it is observed that the basic rating life always decreases in the bearing, while in a few specific conditions in the parametric study, the life increases. To have a fair claim, the condition of the turbine in spacing and wind conditions should be the same.
26. Typing error in line 37: Redundant Kenworthy et al.