The manuscript addresses a relevant topic in the wind industry, providing a novel methodology to assess the impact of blade aerodynamic modifications on turbine performance, using SCADA and O&M data. The paper highlights the complexity of the study and the challenges encountered in completing the initial goal of the study.
The paper is well structured and in general clear - even though some details can be improved to facilitate the readability of the paper (see my comments attached). Otherwise, very good job!

General comments:

- When using an in-text citation where the author's name is not part of the sentence, put the name of the author and year in parentheses to facilitate readability. See the in-text citation Copernicus guidelines.
- I understand that you're using a MATLAB framework to compute the STL long term trend component, short term trend component and seasonal trend. Would it be possible to elaborate on the methodology (driving equations, necessary data inputs or other)?

Specific comments:
Line 4: Add what PLC stands for.
Line 16-18: "Predictions suggest [...] various publications" This sentence lacks a bit of clarity, please reformulate.
Line 34: Add what CMS stands for.
Line 67: I understand that the WTG type and site are confidential. Would it be possible however to indicate the average wind speed at the site and the nominal power of the wind turbine? That would make your results better comparable/ reusable in future related work.
Line 117-119: Do you know if a resolution of 10-minutes which is usually provided and stored by SCADA systems would have been enough for the time series of wind speed, nacelle direction, temperature etc.?
Line 123-124: Do you mean the dynamic yaw misalignment by "the turbine control algorithm hysteresis"? It's maybe worth mentioning the "static yaw misalignment" on these turbines, that would result in a constant error in the wind direction.
Line 213: Consider defining LOESS at its first occurrence (line 198).
Line 262: Is 0.8 a probability or power?
Figure 3: Add a label for the y-axis.

Other remarks:

- Have you considered applying the model on different study cases? It would be interesting to use data from other wind farm(s) to see if the how the model behaves with different assumptions.