Review of "Model test of a 10MW semi-submersible floating wind turbine under waves and wind using hybrid method to integrate the rotor thrust and moments" by F. Vittori et al.

The authors present results from an experimental campaign on a scaled 10MW wind turbine model. The turbine is mounted on a floater designed by Saitec. Rotor forces are modelled with a SiL approach using 4 propellers. Experimental data is compared to a numerical OpenFAST model, and excellent agreement is found. Results appear credible and the methods seem solid. This said, I have some comments:

From a general standpoint, the methods section can be greatly expanded. More details regarding the mooring system are required. No specific details are presented regarding the floater. Also the design choices should be presented in more detail. For instance, what are the design objectives of this particular floater-tower design?

My main concern regards the scope of this paper, that should be addressed clearly. Since the results and the testcase used in the study appear to not be publicly available as they are industrial IP, the scope of this work is not obvious. The original contributions should be better highlighted and conclusions should highlight how industry and academia can exploit the results of this work. I believe the paper currently lacks these considerations.

Below some more detailed considerations:

P3 L60: Please clarify: "This paper shows how the SiL method, including rotor moments, is able to reproduce the dynamic response of the SATH 10MW INNWIND (SATH10MW) floating offshore wind turbine." How is it shown that the SiL method is able to reproduce the dynamic response?

P4 L70 "The scaled thrust is controlled by the motor rotational speed set by an electronic controller, which again depends on the real time simulation of the full scale rotor in a turbulent wind field, considering turbine control action with the platform motions measured in real time in the wave tank test." This is not clear, please rephrase.

P5 L95: Glauert correction is a correction for high induction wake states, the phrase " The aerodynamic loads are based in Blade Element Momentum (BEM) model using the Glauert correction." is confusing. Authors state that the blades and tower are considered rigid, what is the rationale here? This assumption is not always the case for model tests (in OC5 for instance a flexible tower was considered in the numerical models). Please expand.

P5 L102: Why is the SPM mooring system not implemented? And what are the expected impact on system dynamics of the included mooring system? Please expand.

P5 L97: Consider expanding on the way the WT controller was designed, this is an important part of any WT, especially a floating one. Why was a custom controller developed? Is it tailored to the specific needs of this floater design?

Section 3: No mention on how the mooring system is modelled is presented.

P8 L155: It is not clear how the numerical model was calibrated to account for the cable bundle in the experiments, please clarify.

Figures 7-16: When PSDs are presented no labels are included on x-axis, to protect industrial IP. I suggest to normalize the x-values by some physical parameter. A good choice could be the surge natural frequency.

P12 L223: Do the authors have an explanation on why pitch response (fig 12a) at the systems natural frequency seems to be almost completely missed by the numerical models?

Conclusions: Besides the good agreement between numerical and experimental data, the innovative contribution of this study is not clear. Please include some outlook on the relevance of these results.