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Total number of authors:
33

Published in:
Proceedings of the ASME 2018 37th International Conference on Ocean, Offshore and Arctic Engineering

Link to article, DOI:
[10.1115/OMAE2018-77589](https://doi.org/10.1115/OMAE2018-77589)

Publication date:
2018

Document Version
Publisher's PDF, also known as Version of record

[Link back to DTU Orbit](#)

Citation (APA):
Popko, W., Huhn, M. L., Robertson, A., Jonkman, J. M., Wendt, F., Müller, K., Kretschmer, M., Vorpahl, F., Hagen, T. R., Galinos, C., Le Dreff, J.-B., Gilbert, P., Auriac, B., Villora, F. N., Schünemann, P., Bayati, I., Belloli, M., Oh, S., Totsuka, Y., ... Cai, J. (2018). Verification of a Numerical Model of the Offshore Wind Turbine From the Alpha Ventus Wind Farm Within OC5 Phase III. In *Proceedings of the ASME 2018 37th International Conference on Ocean, Offshore and Arctic Engineering* Article V010T09A056 The American Society of Mechanical Engineers (ASME). <https://doi.org/10.1115/OMAE2018-77589>

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OMAE2018-77589

VERIFICATION OF A NUMERICAL MODEL OF THE OFFSHORE WIND TURBINE FROM THE ALPHA VENTUS WIND FARM WITHIN OC5 PHASE III

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ABSTRACT

The main objective of the Offshore Code Comparison Collaboration Continuation, with Correlation (OC5) project, is validation of aero-hydro-servo-elastic simulation tools for offshore wind turbines (OWTs) through comparison of simulated results to the response data of physical systems. Phase III of the OC5 project analyzes the Senvion 5M wind turbine supported by the OWEC Quattropod from the alpha ventus offshore wind farm. This paper shows results of the verification of the OWT models (code-to-code comparison). A subsequent publication will focus on their validation (comparison of simulated results to measured physical system response data). Based on the available data, the participants of Phase III set up numerical models of the OWT in

their simulation tools. It was necessary to verify and to tune these models. The verification and tuning were performed against an OWT model available at the University of Stuttgart – Stuttgart Wind Energy (SWE) and documentation provided by Senvion and OWEC Tower. A very good match was achieved between the results from the reference SWE model and models set up by OC5 Phase III participants.

INTRODUCTION

The Offshore Code Comparison Collaboration Continuation, with Correlation (OC5) project [1], which operates under the International Energy Agency (IEA) Wind Task 30 is the follow-up project of OC3 and OC4, which ran from 2005 to 2009