Exponent®
Engineering & Scientific Consulting

Dorian Brefort, Ph.D.

Senior Engineer | Mechanical Engineering
Menlo Park
+1-650-688-6902 tel | dbrefort@exponent.com

Professional Profile

Dr. Brefort is a naval architect and marine engineer who specializes in design, analysis, and installation of floating offshore structures and their mooring systems. He has broad experience in the floating offshore wind sector, where he has worked on some of the world's largest floating wind farms to date. This includes the identification of project drivers in the early design stages, initial sizing of floating units, stability analysis, numerical modeling and dynamic analysis of these platforms and their mooring systems in extreme storm events and for fatigue considerations, and final installation of these platforms offshore.

Dr. Brefort has also acted as client representative and technical advisor during the implementation phases of floating windfarm projects, with responsibilities including port selection for turbine-platform integration works; mooring hardware procurement for anchors, fiber rope, and chains; and offshore installation campaigns of mooring systems, subsea electric cables, and platform hook-up.

Prior to working in the offshore wind industry, Dr. Brefort completed his Ph.D. in Naval Architecture and Marine Engineering at the University of Michigan with a focus on design optimization applied to early stage ship design. There he developed a framework for incorporating ill-structured and imprecise human knowledge into synthesis models to allow their use in mathematical optimization codes.

Academic Credentials & Professional Honors

Ph.D., Naval Architecture and Marine Engineering, University of Michigan, Ann Arbor, 2018

M.S.E., Naval Architecture and Marine Engineering, University of Michigan, Ann Arbor, 2015

B.S.E., Naval Architecture and Marine Engineering, University of Michigan, Ann Arbor, 2014

Prior Experience

Senior Naval Architect, Principle Power, 2021–2022

Mooring Engineer, Principle Power, 2018–2021

Graduate Researcher, University of Michigan, 2014–2018

Professional Affiliations

Society of Naval Architects and Marine Engineers (SNAME)

Publications

Housner S, Lozon E, Martin B, Brefort D, Hall M. “Seabed Bathymetry and Friction Modeling in MoorDyn,” Journal of Physics: Conference Series, 2362(1):012018, 2022

Brefort D, Singer DJ. Managing Epistemic Uncertainty in Multidisciplinary Optimization of a Planing Craft. Proceedings of the International Marine Design Conference (IMDC), Helsinki, Finland, 2018.

Brefort D, Shields C, Habben Jansen A, Duchateau E, Pawling R, Droste K, Jasper T, Sypniewski M, Goodrum C, Parson M, Yasin Kara M, Roth M, Singer DJ, Andrews D, Hopman H, Brown A, Kana A. An Architectural Framework for Distributed Naval Ship Systems. Ocean Engineering Journal 147; 375-385, 2018.

Brefort D, Singer DJ. Incorporating Subjective Preferences in Design Synthesis Models with Limited Information. Proceedings of the International Conference on Computer Applications in Shipbuilding (ICCAS), Singapore, 2017.

Kana A, Brefort D, Seyffert H, Singer DJ. A Decision-making Framework for Planning Lifecycle Ballast Water Treatment Compliance. Proceedings of the Practical Design of Ships and other Floating Structures Conference (PRADS), Copenhagen, Denmark, 2016.

Shields C, Brefort D, Parker M, Singer DJ. Adaptation of Path Influence Methodology for Network Study of Iteration in Marine Design. Proceedings of the International Marine Design Conference (IMDC), Tokyo, Japan, 2015.

Brefort, D., Bull, D., “Mooring Design for the Floating Oscillating Water Column Reference Model,” Sandia Report: SAND2014-17817, Sandia National Laboratories, Albuquerque, NM, 2014.

Bull D, Smith C, Jenne D, Jacob P, Copping A, Willits S, Fontaine A, Brefort D, Copeland G, Gordon M, Jepsen R. Reference Model 6 (RM6): Oscillating Wave Energy Converter. Sandia Report: SAND2014-18311, Sandia National Laboratories, Albuquerque, NM, 2014.

Project Experience

Dr Brefort has conducted numerous designs of floating offshore platforms and their mooring for deep-water sites on the U.S. coasts and for shallow-water sites around Europe and Asia. This included the initial global sizing and stability analysis of the platforms with respect to project requirements and constraints such as port infrastructure limitations. He has also developed numerical models of platforms and their mooring systems to perform dynamic analysis of the systems to mitigate their risk of failure in both extreme storm events and operational (fatigue) conditions.

Dr. Brefort has acted as a technical advisor and client representative for wind turbine integration works onto floating platforms. In this role, he has interfaced with port authorities to understand local regulations and collect port and meteocean data. He has also surveyed several ports to advise on the suitability of their facilities with respect to client needs. In addition, he designed and performed dynamic analysis of temporary quay-side mooring systems and interfaced with marine warranty and installation contractors to implement the designs.

Throughout his time in industry, Dr. Brefort has had first-hand experience participating in offshore installation campaigns, where he provided technical oversight over prelay campaigns of mooring systems including anchors, chain, and fiber rope components; subsea cable installation; and platform hook-up campaigns to ensure installation complied with specifications.

Peer Reviews

Ocean Engineering Journal