



Offshore Wind Farms and Wind Turbines

Since 1972, Stress Engineering Services has been providing engineering solutions for companies and industries that require in-depth technical knowledge and proven performance in the fields of engineering design and analysis, thermal and fluid sciences, instrumentation, material science, and testing. Our company's multi-disciplinary engineering methods, advanced technology, innovative applications and highly knowledgeable and experienced staff provide proven, quantifiable benefits to our worldwide portfolio of clients.

As a leading provider of engineering solutions in offshore energy, we deliver a wide range of engineering expertise to the offshore wind farm industry. For example, we have performed valuable research and review work on offshore wind turbines for the US Department of Energy and have been affiliated with a number of publications in the topic of wind turbines.

- Fixed and Floating Support Structures
- IEC 61400 Load Cases
- Coupled Analysis
- Concept Evaluations
- Subsea Cable Engineering
- Vibration Assessment & Mitigation
- Integrity Management
- Installation and Lifting
- Mooring Systems
- Materials and Corrosion Engineering
- Component Design, Analysis & Testing
- Instrumentation, Monitoring & Data Analysis
- Failure Analysis and Downtime Reduction
- Metocean and Wind Resource Assessment



ASSISTING WIND FARM DEVELOPERS AND OPERATORS (OFFSHORE AND ONSHORE)

- Fatigue and strength analysis of offshore (fixed and floating) support structures, foundations, and turbines.
- Very fast dynamic analysis for thousands to tens-of-thousands of load cases by utilizing frequency-domain techniques in conjunction with time-domain analysis.
- Site-specific loads analysis (coupled aero-servo-hydro-elastic) of wind turbines with OpenFAST and Orcaflex software.
- Analysis and design of fixed and floating foundation for offshore wind turbines.
- Vibration assessment and mitigation for turbines, support structures, and foundations.
- Structural integrity management of wind turbines.
- Field monitoring (vibrations, strains, acoustic emissions testing) of turbines.
- Wind resource assessment and metocean characterization of the site.
- Assess and address turbine failures and reduce downtime.
- Engineering analysis to support installation and repairs.

The offshore wind sector demands engineering solutions in a range of challenging areas. From mechanics based solutions, design, testing and monitoring services, to structural, dynamic, failure and data analysis, we are equipped to support wind farm developers and operators as well as wind turbine manufacturers, in some of their most crucial engineering decisions.

ASSISTING WIND TURBINE MANUFACTURERS (OFFSHORE AND ONSHORE)

- Improve reliability and reduce failure rates by helping in analysis and design of wind turbine components such as gearboxes, drivetrains, connections, and towers.
- Enhance fatigue characteristics of wind turbine components.
- Vibration assessment and mitigation.
- Finite element analysis (FEA) and computational fluid dynamics (CFD).
- First-principle based engineering solutions to assist with new technology development.
- Mechanical and metallurgical testing of turbine components, including full-scale testing.
- Understand failure modes by analysis of field data and improve design.
- Improve corrosion properties / resistance, especially of offshore wind turbines.
- Assist with support structure and floater design for fixed/floating offshore wind turbines.



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