

# OFFSHORE WIND ENERGY

*Delivering sustainability driven solutions  
to your offshore windfarm projects.*



## Measurement & Monitoring

SES Renewables Solutions™ is an industry leader in remote monitoring solutions. Our talented team has proven experience designing, manufacturing, installing, and commissioning numerous types of monitoring systems. Our solutions are designed to provide accurate and reliable data about the condition of your wind assets for both fixed and floating wind farms.

Specific offerings include:

- Structural monitoring of foundations, towers, blades, mooring, power cables and hull
- Pile driving monitoring
- Customized to monitor many parameters, including loads, strains, inclination, water level, vibration, and corrosion
- Above and below seabed sensing solutions
- Long-term (health monitoring) and short-term field monitoring solutions
- Avian monitoring

## Integrity Management

Our integrity management solutions are designed to reduce operations and maintenance (O&M) costs by managing risk and reducing downtime. We track the health of critical wind turbine systems, which is essential to keeping O&M costs down. Our experienced engineering team provides:

- Monitoring performance through condition monitoring and/or physics-based digital twins
- Actionable insight from the data
- Integrity management services for condition-based maintenance (CBM) and extension of operational life of our client's assets.

## Digital Solutions

The SES Digital Solutions Group develops custom digital products using physics-based digital twins, sensor data, machine learning, data analytics, AI, IoT, and AIoT to provide a comprehensive and real-time health assessment of your offshore wind turbine. Our digital products provide the actionable insight needed to guide wind farm operations are performed in a safe, reliable, and cost-effective manner, which boosts productivity, streamlines operations, and increases profit.



## Testing and Validation

We utilize the broad testing laboratory expertise of Stress Engineering Services, Inc., which is ideally equipped to test wind turbine components. Our testing solutions span from the component level up to full-scale, specializing in custom-designed full-scale structural testing. Specific offerings include:

- Load Testing (up to 6 million lbs. tension/compression, 1.5 million lbs. bending)
- Fatigue Testing (resonant fatigue, 4-point bend)
- Corrosion Testing
- Mooring Rope Testing
- Customized and combined load testing
- Pressure Testing (internal and external pressure)
- Battery Testing

## Due Diligence

We have over 50 years of experience developing and operating commercial-scale energy projects. Our engineering team is composed of subject matter experts in a wide variety of disciplines. We work closely with developers and financiers to provide technical due diligence through:

- Independent third-party reviews
- Validation Testing
- Verification Analysis

## Engineering and Design

At SES Renewables Solutions, we understand our client's problems and challenges. Our talented team of engineers is dedicated to generating the best possible solutions to mitigate risk and reduce costs of our clients' projects. Our experienced team pulls from a toolbox that includes:

- Structural design and analysis (Finite Element Analysis, Computational Fluid Dynamics)
- Global analysis of fixed and floating wind turbine systems (Orcaflex, OpenFAST)
- Installation and lifting analysis
- Metallurgical and corrosion engineering
- Failure Analysis
- Additive Manufacturing



### About SES Renewables

SES Renewables Solutions™ is a division of Stress Engineering Services, Inc. that specializes in renewable energy consulting. Our expertise lies in supporting clients throughout the entire lifecycle of renewable energy projects, regardless of their scale. We offer comprehensive guidance in developing, executing, and commercializing these projects. Our focus is on providing clients with sound technical solutions to design, install, commission, operate, and maintain their energy systems safely and economically.

### About Stress Engineering Services

Since 1972, Stress Engineering Services, Inc. has been a global leader in engineering services and solutions for a variety of industries. We are committed to providing the most comprehensive design, analysis, and testing services with an unsurpassed level of engineering integrity and skill. Our multi-disciplinary engineering methods, advanced technology, innovative applications, and highly knowledgeable and experienced staff provide proven, quantifiable benefits to its worldwide portfolio of clients. For more information, visit [www.stress.com](http://www.stress.com).