



Frontier Pro Services offers experts with over 25 years of experience in operating and maintaining wind turbines. Our mobile technicians provide reliable, quality, on-demand services throughout the United States and Canada. They have a working knowledge of mechanics, hydraulics, controllers and composites. This knowledge is applied toward the condition assessment of the wind turbine necessary in deployment of strategic asset management.

Frontier Pro Services is led by an executive team of wind industry pioneers, with a depth of experience extending from the earliest days of the wind industry in California.

Condition Monitoring

THE NEED FOR CONDITION MONITORING

Many wind farm operations spend unnecessary maintenance resources on reactive and scheduled maintenance. Strategic Asset Management creates a business plan for maintenance and rationalizes maintenance resources to preserve the functions of the asset. Old reactive and scheduled maintenance approaches are cost effectively substituted with condition-based maintenance. However, creating a business plan for maintenance is a complex process. It involves defining a plan which identifies each failure mode and addresses them with the most technically feasible and economical method to either prevent the failure mode or detect its onset. Failure mode detection necessarily employs some form of condition assessment. The struggle is deciding on the appropriate and economical technology to apply as well as which vendor will achieve the objective.

THE FRONTIER PRO SERVICES SOLUTION

Frontier Pro Services offers asset management and conditioning monitoring plans that optimizes operating capacity and maintenance expenditures while managing risk.

We have the tools and strategy that make sense.

We match our service offerings to your needs with options that will work for your operation and the level of risk you are willing to accept.

Flexibility means that you get choices which range from comprehensive asset management of your entire wind farm with remotely-monitored online conditioning monitoring equipment, to discrete condition assessments which include dynamic rotor balance, vibration, lubrication (SOAP, WDA) analysis, and many others. Some additional options to minimize risk include an extended warranty which picks up after your original OEM warranty, thereby lowering risks to an absolute minimum.

www.frontierpro.com

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Condition Monitoring

FRONTIER PRO'S CONDITIONING MONITORING FEATURES:

- Installation and operation of monitoring equipment that collects data on 8 to 16 vibration channels covering all essential components of the drive train and generator. Vibration channels capture high frequency events associated with bearing defects and gear anomalies. Other additional channels capture other wind turbine parameters like power, rotor speed, wind speed, wind direction, and yaw angle
- Oil samples tested in house. Complete SOAP and WDA analysis is performed to identify abnormalities revealed by wear particles and oil chemistry
- Dynamic Rotor Balance Assessment. Our patent-pending in situ method to determine residual rotor unbalance on the wind turbine is an industry first. Unbalanced rotors will contribute to lost revenue and accelerated mechanical life. The in situ method now offers a means to economically manage rotor balance quality on your wind farm without removing the rotor/blades

WHO WE SERVE

An experienced, professional outsource provider of O & M Services, Frontier Pro Services proudly serves many of the wind industry's leading firms. Some of our customers include:

- AES Corporation
- Acciona
- Bluarc
- Clipper Windpower
- DNV Global Energy Concepts Inc. (DNV-GEC)
- Energy Unlimited, Inc.
- First Wind
- GE Energy
- Iberdrola Renewables
- NextEra Energy Resources (FPL)
- Oak Creek Energy Systems Inc.
- Terra-Gen Power LLC
- Vestas

FRONTIER PRO SERVICES

- Tractel Trained
- High Angle Rescue Trained
- Avanti Certified (Service Lift)
- HazMat Certified
- OSHA Certified
- Forklift Certified

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Helping you to manage risk, increase revenue, and reduce the costs of operating your wind farm.

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