

TIMKEN'S RELIABILITY SERVICES

With decades of experience providing reliability services to a range of industries, Timken offers complete predictive maintenance solutions for all your needs. Timken's reliability services monitor your equipment, helping you increase uptime and improve profitability.

While our reliability services are available for many industries, we also offer tailored solutions for the unique demands of wind turbines that are complementary to our wind monitoring system's technology.

These services include:

- Asset prioritization
- Bearing repair
- Balancing and alignment
- Criticality analysis
- Infrared thermography
- Main shaft repair
- Mentoring programs and training
- Oil analysis
- RCM facilitation
- Remote monitoring services
- Root-cause failure analysis
- Ultrasonic testing
- Vibration analysis
- Video imaging



This combination of monitoring technology and services are the key to Timken's proven, award-winning method of managing data and delivering tangible results for customers.

LET US HELP

For more information about the full line of Timken products and services, contact your Timken representative or visit us at www.timken.com/services.

TIMKEN
Where You Turn

Bearings • Steel •
Power Transmission Systems •
Precision Components • Seals •
Lubrication • Industrial Services •
Remanufacture and Repair

www.timken.com



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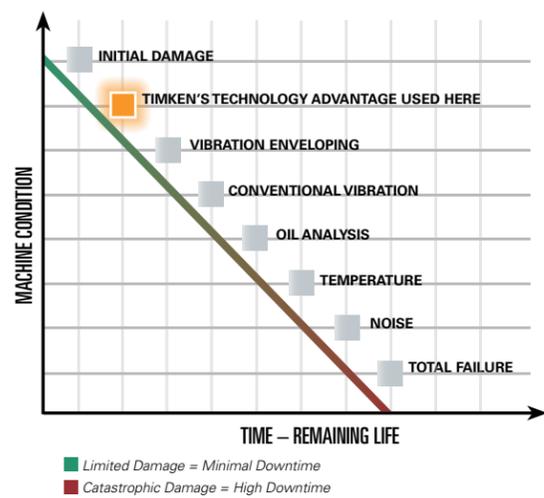
TIMKEN
Where You Turn

WIND ENERGY RELIABILITY SOLUTIONS

OUR TECHNOLOGY ADVANTAGE HELPS MEET YOUR CONDITION MONITORING NEEDS

It takes significant technical expertise to perform condition monitoring in extreme applications. Timken offers a comprehensive wind turbine service platform that includes our online monitoring systems and a service engineering organization backed by more than 100 years of industrial experience.

With operating conditions that change as frequently as the wind, your equipment faces variable speeds, loads, temperatures and more. This makes it very difficult to consistently and accurately monitor operating conditions. It also exposes your turbine components to a wide range of potentially damaging vibration.



Timken's technology advantage and analysis helps you plan your maintenance and lower your overall costs to keep your equipment availability at a high level.

Timken's Online Intelligence System can help. The system uses a revolutionary high frequency measurement technique, specifically with low-speed applications in mind. This helps accurately detect faults such as bearing and gear damage.

This technology features four advantages over conventional vibration techniques:

The Signal - measurements specifically tuned to 32KHz provide optimum detection capability and also filter out unwanted mechanical noise

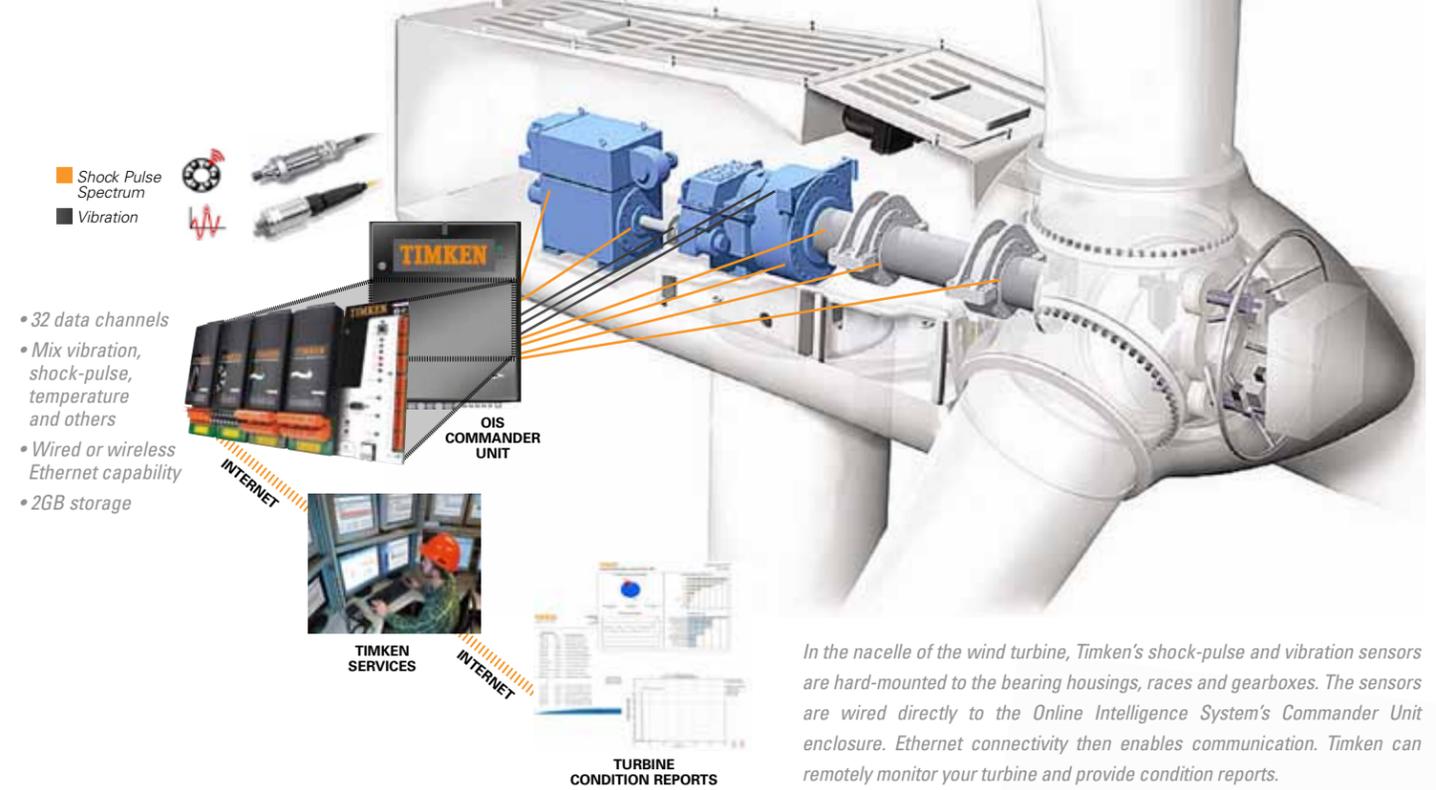
Quality Data - the sample rate through the extended data acquisition period constantly adjusts automatically to handle any variations in machine speeds, preventing smearing and providing high-quality data

Intelligent Processing - advanced algorithms reduce random signal noise and enhance repetitive frequencies of interest, producing textbook-like patterns of data for precise analysis and fault recognition

Absolute Levels - easy to interpret scalar values for accurate trending and alarming, as well as essential bearing lube film assessment

The result - with extremely clear spectrum and time signals - allows for easy interpretations and early detection of problems, even at low speeds traditionally not feasible.

Timken provides comprehensive solutions when you need help ensuring your gearboxes, generator or shaft bearings keep your business running smoothly. With a combination of shock-pulse, vibration analysis and more, we provide early detection of potential bearing and gear problems. Early detection allows for better maintenance planning, reduced downtime and increased cost savings.



In the nacelle of the wind turbine, Timken's shock-pulse and vibration sensors are hard-mounted to the bearing housings, races and gearboxes. The sensors are wired directly to the Online Intelligence System's Commander Unit enclosure. Ethernet connectivity then enables communication. Timken can remotely monitor your turbine and provide condition reports.



Timken's portable Online Intelligence System uses the same technology as the Online Intelligence System, but the portable option is designed for field troubleshooting and temporary installations. The portable system is packaged in a rugged plastic enclosure with external sensor connections, making it perfect for Timken's field services group to support your installations.

PROGRAMS	INSTALLATION SERVICE	MONITORING SERVICE	REMOTE DIAGNOSTICS	DIAGNOSTIC SERVICES	CUSTOMER TRAINING
1 SELF-SERVICE	Customer	Customer	Customer	Customer	Timken
2 HYBRID	Customer	Customer	Timken	Timken	Timken
3 TIMKEN FULL SERVICE	Timken	Timken	Timken	Timken	Timken

Timken offers a reliability program to fit your needs - a self-service program, a hybrid program or a Timken full service program that gives you peace of mind while Timken watches your turbines' performance for you.