

## TIMKEN'S RELIABILITY SERVICES

Timken offers complete predictive maintenance solutions for all your needs. With decades of experience providing reliability services to a range of industries, Timken helps monitor your equipment, providing increased uptime and improved 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 main shaft repair and the following:*

- Bearing repair
- Balancing and alignment
- Infrared thermography
- Mentoring programs and training
- Oil analysis
- 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](http://www.timken.com/services).

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Lubrication • Industrial Services •  
Remanufacture and Repair

[www.timken.com](http://www.timken.com)



1M 06-11:29 Order No. 10275

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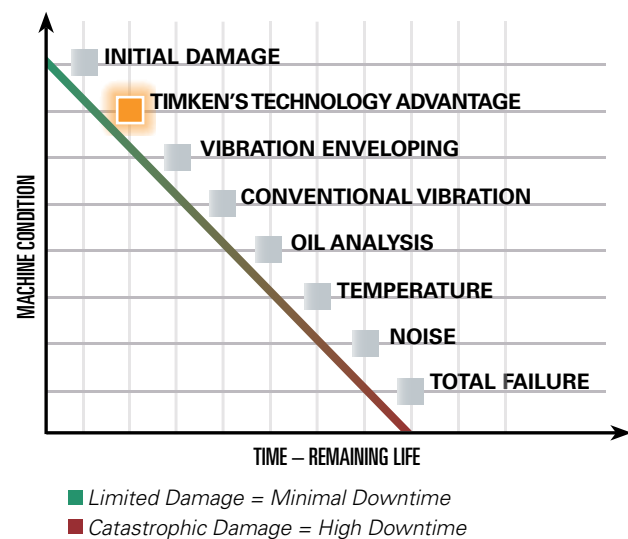
# WIND ENERGY RELIABILITY SOLUTIONS

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# 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 global service engineering support organization.

With operating conditions that change as frequently as the wind, your equipment faces variable speeds, loads, temperatures and more. This complicates consistent and accurate monitoring of 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 running.

Timken's Online Intelligence System uses a revolutionary high frequency measurement technique, specifically with low-speed applications in mind. This helps accurately detect conditions such as bearing or 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

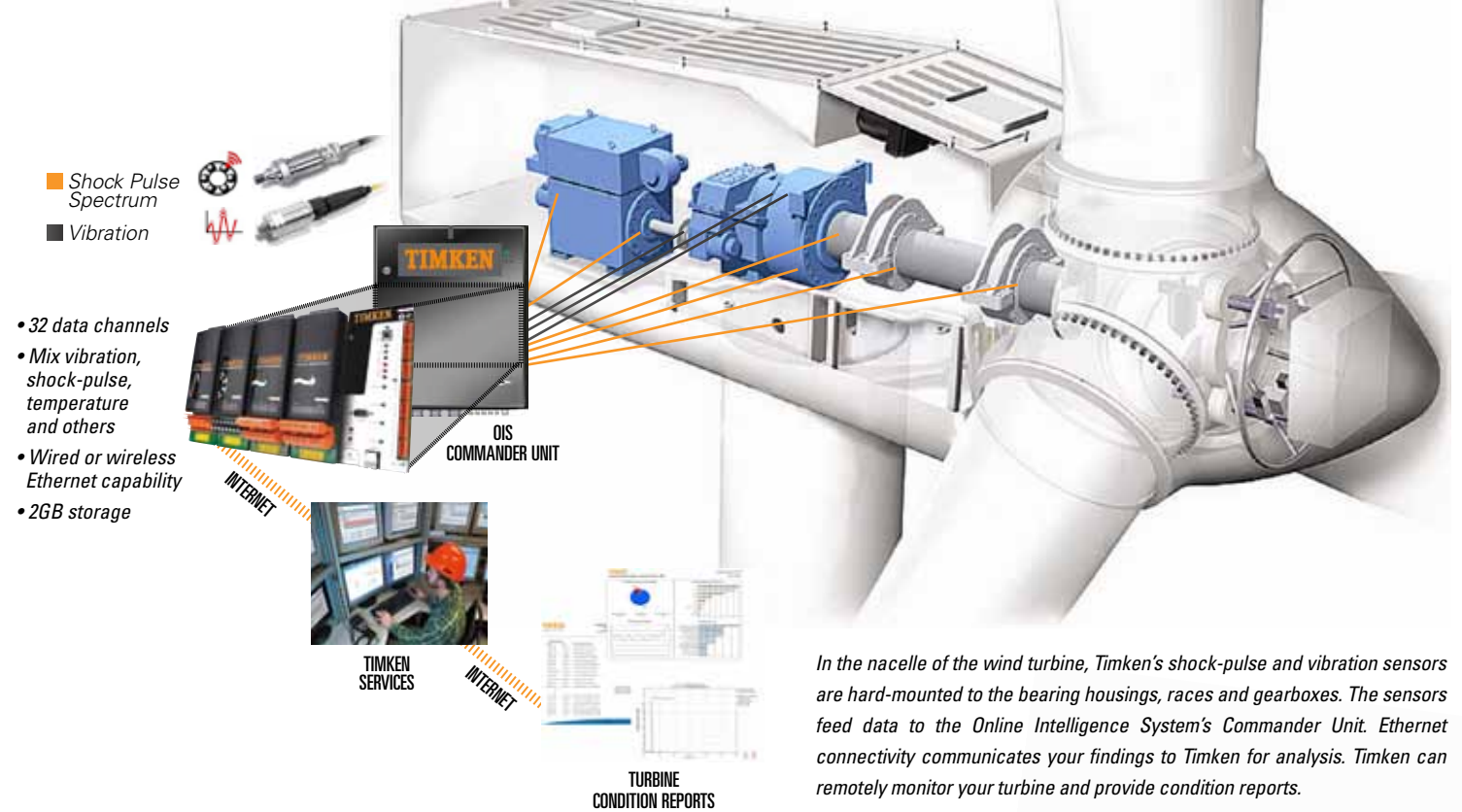
**Quality Data** - the sample rate through the extended data acquisition period constantly adjusts automatically to handle variations in machine speeds, preventing smearing and providing high-quality data

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

**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.

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.



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 rapid 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 applications.

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

Customer (grey square)  
Timken (orange square)

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.