

CASE STUDY

Precision and Power: How RotAlign Boosts Mitsubishi's Turbine Efficiency

With the help of the Prüftechnik RotAlign from Fluke Reliability, Mitsubishi Power Aero achieves precise turbine alignment to give customers power on demand and to sustain efficiency.



Mitsubishi Power Aero is a leader in manufacturing efficient, flexible, and tailored power generation solutions. The company specializes in aero-derivative gas turbine packages.

The need for precise turbine alignment is critical for the predictability and reliability of customer power operations. To meet reliability goals, the company purchased Prüftechnik RotAlign Touch from Fluke Reliability and saw a boost in turbine start-up time and efficient energy production.

Prüftechnik training and technology have helped Mitsubishi Power Aero FT8® and FT4000® field services teams offer customers the best engineering technical support for their assets. Using laser precision for alignment, the team can optimize energy production during peak hours, reduce outage time and cost, and provide peace of mind.

- Turbine engines start up and deliver power in just 10 minutes with precise alignment
- Maintenance with RotAlign is critical for optimized performance during peak hours

BACKGROUND

Mitsubishi Power Aero LLC, headquartered in Glastonbury, Connecticut, and part of Mitsubishi Power Americas, Inc., is the world leader in efficient, flexible, and customized power generation products and services. The company specializes in designing aero-derivative gas turbine packages for its customers.

The turbines, built using Pratt & Whitney's advanced aircraft engine technology, are at the forefront of providing efficient, reliable power around the world. Over 2,000 gas turbines have been installed in some 50 countries, providing power to industrial, global power producers, and oil and gas customers. Mitsubishi Power Aero products supplies energy to universities and fracking operations and even powered the 2014 Winter Olympics.

To ensure customer operations run smoothly, Mitsubishi Power Aero offers comprehensive lifecycle support for gas turbines. The company underscored this commitment by bringing Michael C. Smith on board in 2022 to oversee its aftermarket field maintenance program.

Armed with Prüftechnik's laser shaft alignment solutions, Smith and his team can fix crucial alignment issues with ease and accuracy.

CHALLENGES

Both the Mitsubishi Power Aero FT8® SWIFTPAC® and FT4000® SWIFTPAC® gas turbine packages are free turbines with a jet engine at the front and a power turbine at the rear. They operate without a connecting shaft, as exhaust gas from the engine drives the power turbine to create energy. The power turbine is linked via a shaft to a generator, channelling electricity directly to the grid.

For Mitsubishi Power Aero customers, operational efficiency is directly anchored in the predictability and reliability of the gas turbines in use. Reliability, in turn, hinges on the alignment of the turbines. Any misalignment can trigger significant damage and unforeseen downtime.

“When you have rotating equipment operating at take-off speeds, balance is critical,” explains Smith. “Imagine spinning a top; at high speeds, it appears stable, almost as if standing still. However, as it slows, it begins to wobble. In a jet engine, this imbalance can lead to blades, discs, and vanes colliding, potentially causing catastrophic failure.”

The importance of using the right technology to maintain high accuracy in alignment and prevent the expensive cost of imbalance is evident from these risks. That’s why Smith’s team trusts Prüftechnik, the global leader in laser shaft alignment, to help align their turbines.

IMPLEMENTATION

A Prüftechnik services team trained Mitsubishi Power Aero’s technicians on using the RotAlign Touch tool to fine-tune their gas turbines for best performance.

“The training was very intuitive and easily picked up, so the team was easily trained on the product,” Smith says. “This training, coupled with specific software we developed for integration into the alignment kits, has been pivotal. It equipped our team – and by extension, third-party contractors – with the knowledge and skills needed to help our customers deliver on-demand power.”

RESULTS

Laser precision helps power up gas turbines in just 10 minutes

Mitsubishi Power Aero FT4000® SWIFTPAC® unit, the world’s largest-capacity aero-derivative gas turbine power supply package, provides customers with rapid start capabilities. “Thanks to RotAlign’s precision, these turbines can swiftly achieve full operational capacity in just 10 minutes, becoming key resources in rapidly meeting sudden power supply demands,” explains Smith.

Accurate alignment keeps engines running efficiently during peak hours

During peak periods, like early mornings and evenings when electricity demand spikes, Mitsubishi Power Aero turbines can generate up to 140 megawatts (MW) of power. Smith’s team, using RotAlign Touch, can pinpoint even the slightest misalignments and correct it for optimal performance. This improves not only the life of the unit but also the customer’s profit margin.

WHAT'S NEXT

Mitsubishi Power Aero will continue to employ RotAlign as its go-to solution for turbine alignment. RotAlign’s ease of software integration makes it a strategic choice for the company’s future alignment needs, ensuring that its commitment to precision and quality remains uncompromised.

This commitment also supports the company’s goal of providing flexible power solutions that complement intermittent renewable sources like wind and solar, which is key to navigating the global shift towards cleaner energy.

“RotAlign’s laser alignment fine-tunes our turbines for perfect balance at take-off speeds, ensuring power delivery without fail. Without it, it’d be a disaster.”

— Michael C. Smith,
Mitsubishi Power Aero



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