ANALYTICS FOR HEAVY EQUIPMENT

DATA ANALYTICS REDUCES GAS TURBINE GENERATOR DOWNTIME AND FAILURES

About the Customer

Serba Dinamik is a multi-billion-dollar supplier of services and power generation systems to the oil and gas industry. Its gas turbine generators are employed by Petronas, Shell, ExxonMobil, and other major exploration and drilling firms to provide power on offshore oil rigs. Serba's turbines power all critical systems on the rigs, including safety systems and pumps. Their reliability is therefore essential to smooth operations on the rigs. Platform operators stand to lose millions of dollars per day should a turbine fail so the equipment must be consistently reliable with no unplanned downtime.

> "Our Altair-powered SPMDS is critical to our operations. We know in advance when a turbine needs maintenance and we can plan accordingly in advance. This reduces unplanned downtime and helps eliminate unexpected failures. Implementation of the SPMDS contributes to a new era in our company asset management system that will help us increase revenue.
>
> Mohd Azam Mat Nawi,
> General Manager, Serba Dinamik

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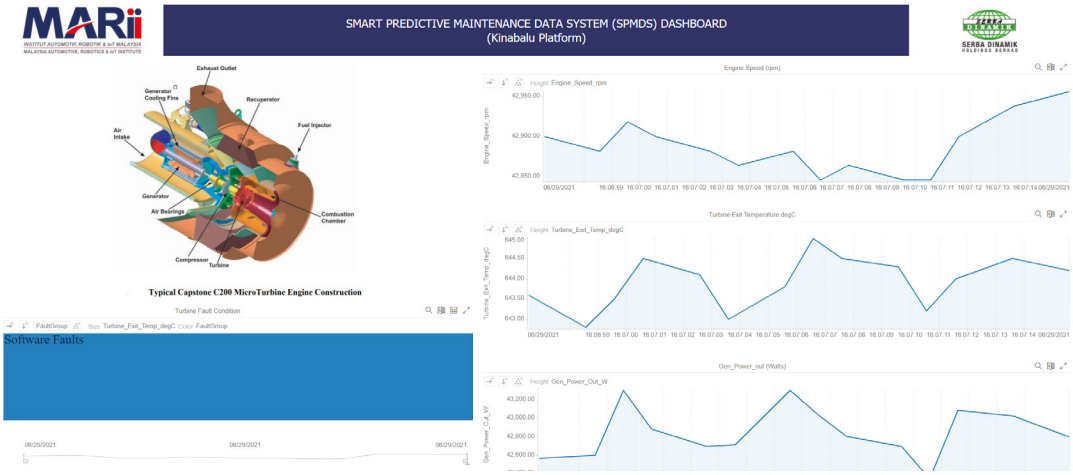

LEFT: Panopticon dashboards display real-time sensor data streaming in from turbines. **TOP:** Serba Dinamik ran tests using turbines located in Jambi, Indonesia. **BOTTOM:** Sensors relay real-time data over MQTT to Serba Dinamik's SPMDS.

Their Challenge

Serba Dinamik's management wanted to **implement an advanced predictive maintenance system** that would do more than simply limiting downtime. They needed to provide clients with on-demand visibility into the turbine performance and potential future variances from normal operation, detect anomalies and outliers in sensor data that may indicate impending failure of a subcomponent, and provide clear guidance on optimal maintenance scheduling based on planned rig operations and equipment performance.

The Serba team set a goal of boosting output for their microturbine power generators by an average of 25%, reducing downtime by 70%, and cutting maintenance expenses by 25%.

Our Solution

Serba Dinamik has been using Altair's design and simulation software to develop, debug, and manufacture turbines for many years. Altair suggested that the artificial intelligence (AI) and machine learning (ML) capabilities of Altair® Knowledge Studio® and the real-time data visualization capabilities of Altair® Panopticon™ would **improve the reliability of turbines mounted on offshore rigs.**

Serba's management group recognized the value of moving away from time-consuming traditional preventative maintenance schedules. By developing a predictive maintenance system, they could take preventative action only when needed.

Serba had access to a very large set of performance data for their turbines that enabled them to use the unsupervised ML capabilities of Knowledge Studio to identify patterns, trends, and outliers in the historical performance data and then build AI models that would flag emerging patterns in operational data. Working with engineers from three key hardware vendors plus Altair, the Serba team built and tested an AI model to predict when maintenance tasks are required plus a set of analytical dashboards that enable shore-based personnel to monitor the performance of offshore turbines. A series of tests using historical data and live data from operational turbines proved the validity of the approach.

Results

Serba Dinamik's engineering team worked with Altair and ORS Technologies Sdn. Bhd., a Malaysian engineering consulting firm, to develop a new Smart Predictive Maintenance Data System (SPMDS) utilizing Knowledge Studio and Panopticon. After a six-month testing period, Serba's crews began using SPMDS to monitor the performance and maintenance requirements for turbines in the field. The maintenance crews use Panopticon-powered dashboards built into SPMDS to monitor every sensor mounted on operating turbines in real time. AI models built with Knowledge Studio identify potential failures or issues that require engineering attention, and, based on that understanding, take turbines offline only when necessary.

To learn more, please visit altair.com/manufacturing-analytics