MHPS
REVOLUTIONARY ENERGY

Mitsubishi Hitachi Power Systems

WHY WE HOLD THE RECORD FOR RELIABILITY AT 99.5%.

MHPS T-Point Boosts Power Plant Reliability and Efficiency

When it comes to power plant performance, gas turbine reliability is paramount. Millions of dollars and professional reputations are on the line. Service interruptions and unscheduled maintenance damage bottom lines and can have far-reaching implications for regional economic development.

Identifying issues and fixing potential problems, both large and small, before new gas turbine technology is released to customers around the globe is the focus of the Mitsubishi Hitachi Power Systems (MHPS) T-Point demonstration power plant located at the Takasago Works in Japan. This constant journey towards perfection has resulted in MHPS claiming the coveted position of manufacturing both the world's most reliable and most efficient Advanced Class Gas Turbines (ACGT).

Achieving industry records for reliability requires a fundamental approach anchored in a commitment to long-term verification testing, coupled with aggressive research and development, sophisticated design capabilities, a focus on high-quality manufacturing and advanced technical service skills training.

The T-Point Difference

MHPS is the only OEM that conducts long-term quality assurance verification on turbine products before certifying the equipment ready for commercial manufacturing. Built in 1997, T-Point is more than a beta test lab, it is a commercially dispatched combined cycle power plant designed to provide real-world performance and durability validation for Advanced Class Gas Turbines (ACGT) before they are made available to customers around the globe. T-Point produces electricity under contract that is sold to the grid, helping to cover fuel and other costs, making this level of testing economically feasible. The facility averages 5,000 actual operating hours on an annual basis.

T-Point enables MHPS to identify potential issues and adjust new turbine technology before it goes into production. T-Point also allows the research and development team at the Takasago Works to test new ideas and tweak existing designs to improve power plant efficiency, reduce emissions, enhance maintenance procedures and improve overall plant uptime.

MHPS Takasago Works

The Takasago Works was established in 1962 to manufacture turbines and machinery for large-scale power plants. Over the years the facility has been at the vanguard of developing high-efficiency gas and steam turbines. Along the way a number of key elements have been added to the manufacturing plant to make the Takasago Works a fully integrated

research, design engineering, production and testing facility that is unique among OEMs in the power-generation industry. MHPS has also added a Technical Skill Education Center at the facility that trains crews on advanced techniques for installing and maintaining turbines. Takasago is also home to one of the MHPS Remote Monitoring Centers, which enables real-time data transfer between customer power plants to expert engineers, providing 24-hour support. The team at the Takasago Remote Monitoring Center can quickly diagnose potential operational issues and offer recommendations for on-line tuning, troubleshooting adjustments and scheduled maintenance procedures.

The 217-acre (879,621-square-meter) Takasago Works complex is located about 25 miles (40 kilometers) west of the city of Kobe in the Hyogo prefecture. The facility allows for the in-house manufacturing of major turbine components, including blades, rotors and casings. Takasago Works has an annual production capacity of 8,000 MW of gas turbines, 2,400 MW of steam turbines and 750 MW of water turbines.

Takasago Works is the only facility in the world where research and development, design, manufacture and verification take place in a single location. This vertical integration of the turbine building process allows for close collaboration among the MHPS team. This results in turbine technology advancements that drive the industry forward, producing energy more efficiently and reliably for customers around the world.

T-Point in Action

The MHPS JAC-series turbine has racked up more than 11,000 hours of service with more than 700 starts during ongoing verification testing. The MHPS JAC-series is an advanced-class air-cooled gas turbine that operates at a combined cycle efficiency level exceeding 63 percent. In a combined cycle one-on-one configuration, the JAC has a 540 MW plant output.

No other OEM commits to this level of extensive testing of its gas turbine products. There are a number of potential reliability issues, such as low cycle fatigue and thermal barrier coating deterioration, that require thousands of operating hours before they become apparent. This comprehensive debugging of new technology before it hits the market is a critical reason why MHPS has the most reliable fleet of gas turbines available from any OEM. This level of testing and its impact on turbine reliability is reflected in favorable insurance industry ratings for MHPS proven ACGT.

Planning for the Future

Reflecting its ongoing commitment to producing the most reliable turbines on the market, MHPS is developing the next-generation advanced high-efficiency combined cycle plant and plans to build a new verification facility adjacent to the current T-Point. The new facility, featuring a single-shaft one-on-one configuration, is scheduled for completion in July 2020.