



Plant Details

- Bandirma-1 Combined Cycle Power Plant
- 936 MW Thermal Power Plant
- Owned by Enerjisa Enerji Uretim A.S.
- Bandirma, Turkey

Equipment Notes

- 2 MHPS M701F Gas Turbines
- 1 MHPS TC4F Steam Turbine
- MHPS Netmation Turbine Control System
- MHPS Plant Monitoring
- MHPS-TOMONI™ Solutions Installed: 2014, 2015, 2017

Digital upgrades expand Bandirma-1's ability to profit from ancillary services.

MHPS-TOMONI™ Solutions Used:

Performance Improvement:

- IGV Optimization
- Power Augmentation

Flexibility:

- Ramp Rate Maximizer

CHALLENGE

Originally designed for base-load operation and entering service in 2010, the demands of the Turkish power market changed for Bandirma-1 Combined Cycle Power Plant due to the increased penetration of renewable energy. This caused the plant, owned by leading private generation company Enerjisa, to operate at partial load more often and led to them seeking the ability to operate more flexibly and to find other ways to drive revenue.



SOLUTION

Bandirma-1 and MHPS worked together to select two solutions to provide the ability to take advantage of ancillary services markets and one to allow the gas turbine to operate more efficiently at partial load.

To profit from ancillary services markets, MHPS TOMONI™ Ramp Rate Maximizer and Power Augmentation were the answer. Ramp Rate Maximizer, a Flexibility Solution, is used to improve gas turbine ramp-up rate. Power Augmentation, a Performance Improvement Solution, is used to improve the combined cycle ramp-up rate while under frequency control by regulating the increase of gas turbine airflow to compensate for the steam turbine load-up delay in a two-on-one configuration. These solutions were applied in 2014 and 2015 to give the plant more secondary frequency control reserve capacity and allowed the plant to earn significant additional income.

The MHPS-TOMONI IGV Optimization Solution, another Performance Improvement Solution, was implemented to improve partial load efficiency. It combines hardware modifications with new digital control strategies to more precisely control inlet guide vane (IGV) closing to maximize exhaust temperature at part loads while maintaining combustion stability. This allows Bandirma-1 to run more efficiently during partial load operation. This solution was applied in April 2017.



RESULT

These modifications increased Bandirma-1's average efficiency and ability to take advantage of ancillary services markets, creating fuel cost savings and added revenue. The pairing of the Ramp Rate Maximizer and Power Augmentation allowed the plant to earn an average of 650,000 USD of additional income annually. IGV Optimization reduced fuel consumption, which led to a savings of 230,000 USD annually.

“When our situation changed in 2014, we looked to find ways to better operate and boost income. MHPS-TOMONI solutions gave us the ability to be more competitive in a market affected by renewable power generation and allowed us to find ways to make additional profits. Not only did it improve our dispatch priority on the grid, but it also enabled us to have a more profitable plant.”

Idris Akriba
*Plant Manager, Bandirma-1 Combined
Cycle Power Plant*

For more information about the MHPS-TOMONI™ suite of digital solutions visit changeinpower.com/tomoni or contact your MHPS representative.

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MHPS-TOMONI™

MHPS is leading the development of the digital power plant of the future with MHPS-TOMONI, a suite of digital solutions enabled by decades of O&M and plant knowledge. Our solutions are driven by customer collaboration and use advanced analytics and adaptive control to lower the cost of electricity and achieve environmental and business goals.