

Reducing minimum load: Cost-effective independent solution

Snapshot

Client

Gönyü Combined Cycle Gas Turbine plant, Hungary

Challenge

Reduce minimum operating load from 210 MW to 160 MW while ensuring full emissions compliance and flow stability of the once-through boiler.

Solution

We analyzed impact of reduced load using steady-state and dynamic process calculation of the water/steam cycle. Modifications were validated with plant test runs. Measurements from additional thermocouples confirmed that tube stress remains permissible.

Benefits

The plant's flexibility and commercial competitiveness were improved by reducing its minimum load by almost 35% without need for hardware investment. Annual operating hours increased from 2,000 to more than 6,500 hours.

Reducing minimum load improves CCGT flexibility and competitiveness in challenging market conditions. In this case, our independent know-how as CCGT operator combined with state-of-the-art process simulation enabled us to identify potential issues early in the project and to successfully deliver minimum load reduction at minimum cost.

Analyzing potential impact

We studied the impact of new exhaust parameters on the water/steam bottoming cycle, on overall process efficiency and on auxiliary systems.

We quickly identified that a critical issue was potential instability in the high-pressure section of the once-through heat recovery steam generator (HRSG). Dynamic simulation was used to develop effective measures against flow imbalance and additional thermocouples were installed to monitor steam temperature differences in heat exchanger tubes.

Reliable and cost-efficient

Our work focused on finding the most reliable and cost-efficient technical solutions, working closely with the power plant staff and independent of the original equipment manufacturer.

The process modifications we recommended to deliver minimum load reduction and improve efficiency – including increased HP pressure to counter possible flow instability in the HRSG and replacing auxiliary boiler steam with LP steam – were tested and refined based on the results from our simulations.

We provided on-site support for practical implementation of the technical measures to ensure successful commissioning of the new minimum load operation, delivering the financial benefits of improved flexibility without need for further plant investment.

35%

minimum load reduction achieved

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