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CASE STUDY

EXCEEDING RESULTS

How One Powerplant Reduced Emissions and Improved Efficiencies While Meeting Environmental Initiatives

HIGHLIGHTS

Achieved record heat rate of
9,900 Btu/kWhr

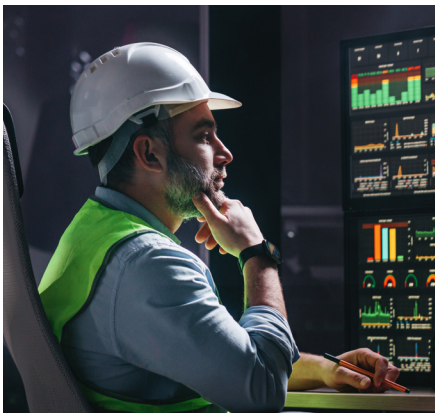
Projected year-over-year heat rate improvement of
1%–2%

Maximum Achievable Capacity
590 MW

Operating at
570 MW

BACKGROUND

In a dedicated effort to improve efficiency and reduce emissions, a large Midwest thermal power company teamed up with the Sierra Club to champion environmental protection. Their ambitious agreement promises to reduce emissions and boost efficiency, setting a new standard for more environmentally friendly energy. The new solution they adopted has already delivered rapid, dramatic, and continuous results, transforming the city's energy landscape, and paving the way for a greener future.



BUSINESS CHALLENGES

To honor their commitment to the Sierra Club, the company meticulously evaluated various technologies before selecting the EtaPRO® Performance & Condition Monitoring System from EtaPRO® LLC, a Toshiba Group Company. They chose EtaPRO for its cutting-edge VirtualPlant™ models of the boiler and turbine cycles, its feature-rich online monitoring software, and the company's extensive experience in deploying fleet-wide monitoring solutions.

Making operational and heat rate goals a reality.

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EtaPRO's real-time "gap" analysis pinpoints performance deviations that lead to lost capacity and increased fuel consumption. The system sets realistic operational and heat rate targets that can be achieved through strategic operational changes and routine maintenance. Additionally, EtaPRO provides real-time financial insights, empowering the company to justify equipment and process improvements with solid data.

With "What if" scenarios and virtual modeling, VirtualPlant allows engineers to quantify the impact of changes in equipment condition before they actually implement them to determine what modifications are really needed. Together, these tools offer real-time insights into system conditions and powerful modeling capabilities to predict the outcomes of various responses, ensuring optimal performance and efficiency.

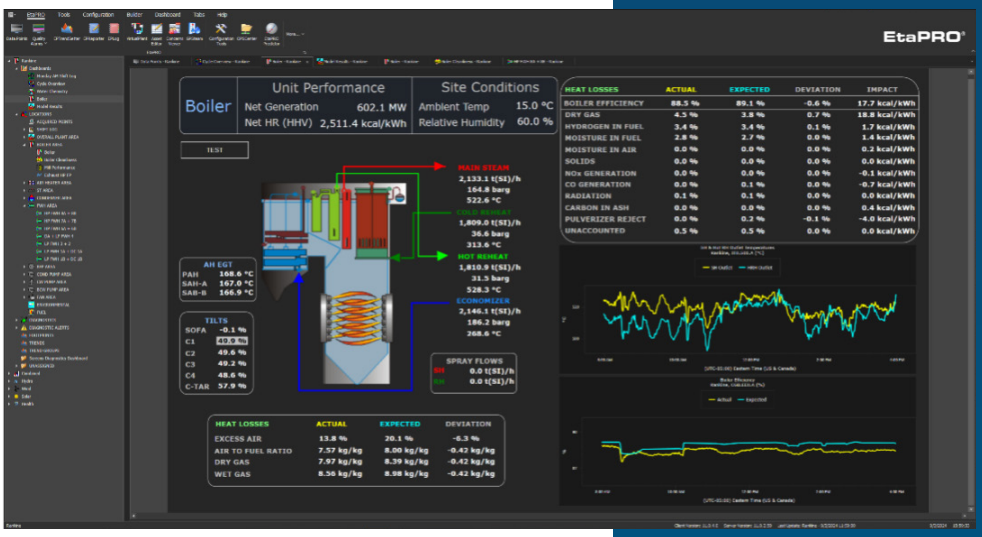
GOALS

Achieving record low heat rates soon after EtaPRO's implementation

After installing EtaPRO and VirtualPlant, the team gained unprecedented insight into their system's performance and the remarkable improvements these solutions delivered. *"EtaPRO provides plant personnel with feedback to effectively monitor incremental improvements in plant operation,"* noted the plant's Principal Performance Engineer.

> ***"The plant operators and engineers see lower heat rates on the screen with every improvement they make. We're also validating the results by running EtaPRO reports and comparing them to a separate report created by the fuels department. When the heat rate results concur on both reports, this confirms that the improvements are really paying off."***

Deploying new technologies in the plant goes beyond just end-user training. EtaPRO's FastStart™ service kicks off immediately after a system is installed and commissioned. Routine, scheduled, collaborative sessions immerse the plant staff in EtaPRO's state-of-the-art capabilities, addressing specific challenges they face.



EtaPRO Screen – Boiler Conditions

With FastStart, we look at the live EtaPRO system with their performance team every other week. During one recent session, staff noted that a growing number of reheater tubes were running at higher-than-normal temperature," explains the client. "After some follow up investigation, the EtaPRO team alerted us that some of the tubes were exceeding allowable temperature limits, which could lead to tube leaks and premature failure. This prompted a retuning of reheat temperature controls."

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THE SOLUTION

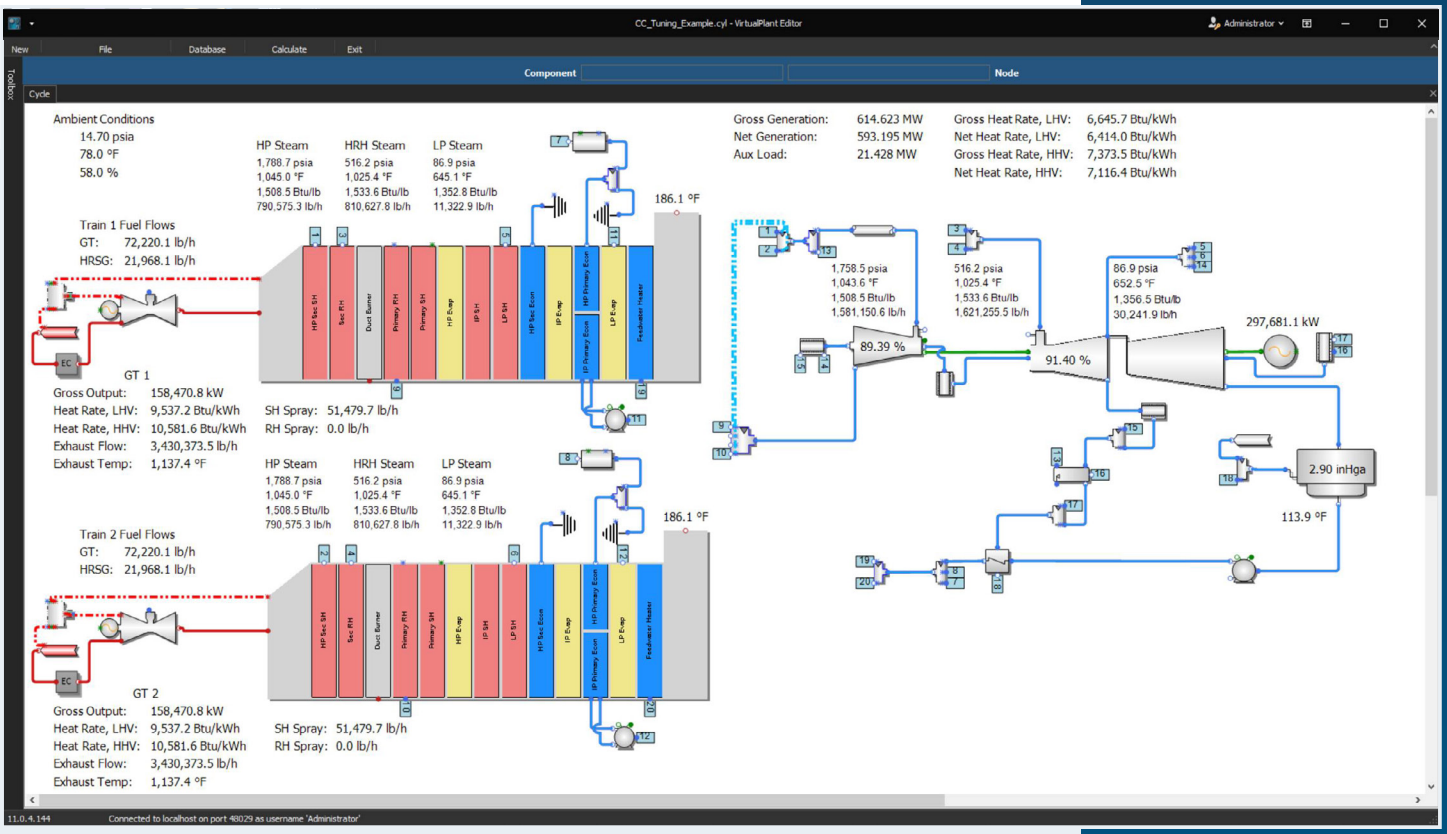
Becoming part of the team to foster solution success

The company's performance teams dive deep into operational and equipment changes using EtaPRO's cutting-edge VirtualPlant models to quantify the resulting boosts in capacity and heat rate. When an operating change or maintenance action is implemented, plant personnel track key performance indicators in EtaPRO to verify real-world improvements.

FastStart collaboration empowers the client's team to identify issues and master the solution's intricacies. For instance, during a major turbine overhaul, the team swiftly determined the HP turbine efficiency gain from the capital project, thanks to EtaPRO's ability to calculate and record HP turbine efficiency data in the plant historian before and after the upgrade.

> The Principal Performance Engineer highlights, ***"Having quick confirmation helps fine tune the process. And it provides the data in such a way that it's easy to understand and easy to disseminate across the plant. EtaPRO provides additional levels of information that allows our plant performance engineers to target and improve specific areas of deviation from design plant performance."***

> ***When we looked at the whole fleet, we wanted to go with the best technology. We wanted a solution that was robust and flexible to handle all our plants, and we knew EtaPRO was the right answer."***
>
> **- Principal Performance Engineer**



EtaPRO VirtualPlant Screen

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THE RESULTS

Improving heat rate 1%-2% year-over-year

The urgent need to reduce carbon emissions has sharpened management's focus on plant performance like never before. By zeroing in on heat rate improvements at its coal units, the company has adopted one of the most effective strategies for cutting carbon emissions. **Following the implementation of these measures, the fleet achieved a record-breaking heat rate of 9,900 Btu/kWhr, operated near full capacity, and was on track to achieve a year-over-year heat rate improvement of 1%–2%.**

Inspired by the early success at the power plant, their ambitious CO_2 initiative, and their agreement with the Sierra Club, the company fast-tracked the deployment of EtaPRO across its entire fleet of six coal and combined cycle plants. This bold move promises to drive even greater efficiencies and environmental benefits across their operations.

For more information on how EtaPRO is helping plants reduce emissions and improve reliability , visit www.etapro.com.

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