ENKA
Affordable Efficient Electricity with the PI System

ENKA

Turkey's booming electric power industry has meant a need for efficient, rapid growth. ENKA, a leading construction firm, won a bid to construct three new power plants in the early 2000s. By using the OSIsoft PI System™, ENKA has been able to seamlessly deliver energy to the booming Turkish economy, controlling costs and virtually eliminating downtime.

"The PI System helps us provide the right tools and data to employees so they can achieve maximum operating efficiency and uptime."

– Ertan Atçeken, Planning and Plant Performance Manager, ENKA

Situation

Turkey's economy has been a bright spot amid the troubles of its European neighbors and its growth has driven booming demand for energy. Between 2001 and 2010, electricity demand grew 70% and it shows no signs of slowing down – electricity demand is expected to more than double over the next decade. ENKA, an important industrial conglomerate in Turkey, has played a significant role in meeting that demand.

In 1997, the company — in partnership with InterGen — was selected to build three major combined-cycle power plants with a total capacity of 3.85 gigawatts. The contract was part of the shift from a state-owned energy sector to private ownership and the team signed a deal to build, own and operate the facilities for 20 years. With a goal of bringing all the plants online in just four years' time (starting from the date of contract), the team had its work cut out for it. New plants needed to be designed, built, tested, commissioned and operated efficiently. Turkey imports nearly all of its fuel, so the plants are highly susceptible to changes in the energy and commodity markets. Operating with maximum efficiency would be key to their financial success and enable ENKA to quickly recoup their investment. Furthermore, in an era of awareness about the environmental impact of power generation, the new plants had stringent performance and reporting requirements that had to be met from day one.

In order to ensure that the plants came back online quickly after forced shutdowns, performed efficiently and reliably, the team needed access to data as early as possible. The plants, designed with a diverse array of equipment intended to maximize performance, are home to dozens of different assets with different data formats and outputs. ENKA needed to aggregate all of that data into a common, shared environment in order to accurately assess the plant's operation, identify issues and troubleshoot solutions. To do so, it turned to the PI System.

Solution

The PI System was identified during the plant design stage as a key tool for achieving peak performance, alongside General Physics' EtaPRO software, and was installed in ENKA's three plants in 2001. While the PI System was originally intended to simply provide data for the other system, ENKA quickly realized that the PI System offered robust data analysis and visualization tools of its own. By 2003, the system opera-

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tions and IT teams had begun using PI ProcessBook™ and PI DataLink™ for plant performance reporting. Today, more than 200 users access 85,000 data streams from across the three plants.

The PI System is also used to provide the data required for mandatory government reporting about emissions and ancillary services. "By using the PI System, we can easily pull the data and provide real-time reporting without spending money on another application," says Ertan Atçeken, Planning and Plant Performance Manager at ENKA.

Benefits

The PI System has helped ENKA to deliver on its promise of efficient, affordable, electricity. ENKA engineers rely on PI System data and reports to help plan energy production, manage the production process and provide upstream reports to managers, executives and regulators.

"The PI System provides very scalable, continuous, fast and reliable data," says Atçeken. During the design and development phase of the plant, the company used the PI System to set the optimal operating parameters for the equipment. Engineers then used PI System data to verify that equipment was performing correctly in the field. That helped ensure that the plants are kept online. It also meant that problems could be quickly diagnosed and corrected.

By using the PI System data, ENKA has been able to achieve significant financial savings, through streamlined reporting and preventative maintenance — but also by identifying and addressing system-wide problems. For example, ENKA's engineering team noticed that excess steam, instead of being re-routed to the turbines, was being lost. They used the PI System to define and run tests on the system and they located a problem with the bypass valves. They reported this to the manufacturer, supported by data from the PI System and the manufacturer addressed the issue, during the warranty period for the part, saving the company approximately $1 million.

The PI System has also helped ensure that the plants continue to operate at peak performance levels over time. The PI System collects data from 10 gas turbines and 5 steam turbines which allows ENKA to compare the current operating state against data from when those units first came online 13 years ago. Engineers actively monitor key process parameters such as temperature, pressure, humidity, etc. in order to manage the equipment for optimal performance — a state they can easily recognize, based on their deep, easily accessible historical data archive. As a result, the plants have achieved remarkable 96% uptime including scheduled maintenance overhauls over the past 12 years.

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Business Challenge

- Three new natural gas power plants to be brought online in a 4-year period (starting from the date of contract).
- Turkey's growing energy demand and fuel imports make efficiency critical for generators.
- Transition from state-owned to private energy sector came with stringent report requirements.

Solution

- The PI System collects data from three plants.
- Engineers use PI ProcessBook and PI DataLink to access detailed, role-based reports.
- PI System reporting tools help the plants comply with regulatory requirements.

Customer Results

- Plants were brought online smoothly and reliably.
- Plants continuously operated up to optimal performance based on historical data benchmarks.
- Using the PI System to monitor steam pressure helped identify and fix an issue, saving approximately $1M.