



**Yokogawa in the
Power Industry**





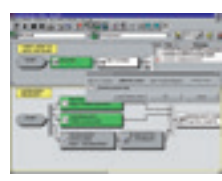


Co-innovating tomorrow™

In a business environment that has changed dramatically, Yokogawa continues to create new value with our partners and strive for growth along with our customers. We shall also continue as good citizens with the courage to innovate.










Your Single-Source Partner for Operational Excellence

Optimize

Production Management				Asset Management and Operational Efficiency			
Plant performance calculation and monitoring	Plant optimization	SCADA	Operation guidance	Integrated Plant Asset Management	Operation training simulator		
 Exaquantum/PPC	 RPO: Real-time Production Organizer	 Visual MESA	 FAST/TOOLS	 Exapilot	 PRM: Plant Resource Manager		

Control

Production and Safety Control			Data Acquisition and Logic Control			
Integrated Production Control	Integrated Safety Control	Hybrid PLC/RTU	PLC/PAC	Paper and Paperless Recorder	Data Acquisition Equipment	Controller and Conditioner
 CENTUM VP	 ProSafe-RS	 STARDOM	 FA-M3			

Measure

Sensing and Actuation							Analysis and Quality Control
Flow	Multivariable	Pressure	Level	Temperature	Wireless	Distributed Temperature Sensor	Analyzer
							
Test and Measurement							
Oscilloscopes	Digital Power Analyzers		Generators, Sources, Manometers etc.		Optical Measuring Instruments	Portable and Handheld Instruments	
							

Wide application experience in the power industry

Fossil fuel fired power plants

- Coal/oil/gas fired
- Combined cycle
- Simple cycle
- Co-generation
- Industrial boilers
- Independent water and power producers (IWPPs)



Coal fired power plant



Combined cycle power plant



Industrial boiler plant/co-generation plant

Environment protection

- Flue gas desulphurization (FGD)
- Circulating fluidized bed (CFB) boilers



FGD plant



CFB boiler plant

Renewable power plants

- Geothermal
- Biomass
- Waste to energy
- Solar
- Wind
- Hydro



Geothermal power plant



Biomass power plant



Solar thermal power plant



Wind power plant



Hydro power plant

Total power plant control system

Human interface station/ engineering station

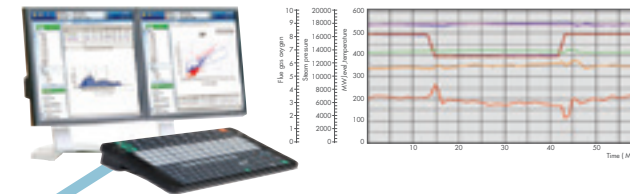
The human interface station (HIS) provides a unified and intuitive operating environment. Screens are ergonomically designed and arranged to reduce operator fatigue and discomfort. The engineering station provides powerful configuration tools and a virtual test function.



CENTUM VP

Plant information management

All types of plant information including process data, alarms, events and sequence of events (SOE) are handled by plant information management, enabling the analysis of plant operational performance.



Plant resource management

Plant resource management integrates and manages maintenance information from field instruments and monitors online conditions.



Turbine Governor Control



The FCS with turbine specific modules enable:

- Speed/load control
- Overspeed protection control
- Surge detection
- LVDT calibration
- Turbine run-up

Field Control Station (FCS)

The FCS provides powerful control functions with a highly reliable dual redundant configuration that incorporates Yokogawa's own pair-and-spare technology.



Boiler & BOP Controls



- Unit master control
- Boiler control
- Automatic plant start-up

ProSafe-RS

Power Plant Protection



- Burner management system
- Boiler protection
- Turbine protection

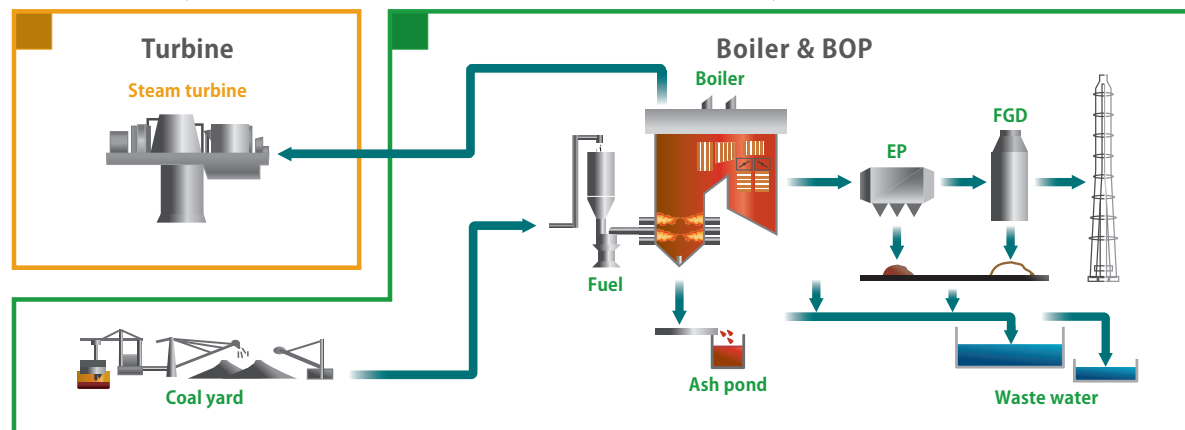
Safety Control Station (SCS)

The ProSafe-RS SCS is a TÜV SIL3 certified safety system that incorporates Yokogawa's own pair-and-spare technology.

Electrical Control

Integrated electrical control and monitoring system via IEC61850, IEC60870 and DNP3.0

Control LAN (Vnet/IP)



Typical coal fired power plant

Optimum energy operation with IIoT technologies for smart communities

SCADA & Plant Information Systems



The STARDOM's autonomous controllers are highly durable and provide support for CANopen, Modbus, Profibus, and various other network protocols. STARDOM controllers are suitable for energy management systems, they help smooth out power demand and power supply and optimize energy consumption.

CEMS

Community energy management system



FEMS

Factory energy management system



BEMS

Building energy management system



Supervisory Systems FAST/TOOLS™

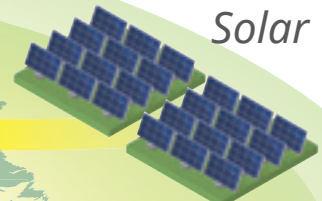
The FAST/TOOLS SCADA is a complete platform independent software solution with high performance, high capacity and a truly open architecture. As an enterprise automation solution (EAS), it unifies multiple plants/locations as one entity and enables centralized operation and monitoring. The FAST/TOOLS web-based SCADA system enables remote engineering, maintenances and monitoring of all the distributed sites from a single remote monitoring center.

HXS10

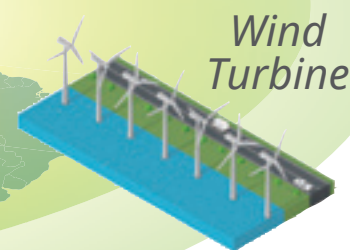


The HXS10 is a solar tracking controller with a built-in solar position calculation algorithm. It precisely controls the actuators that align the solar mirrors with the sun. This optimizes the collection of thermal energy produced by concentrated solar power (CSP) facilities.

Solar



Wind Turbine



EV Station



FA-M3 VITESSE™



The FA-M3 is a high-performance programmable logic controller (PLC) that combines very high processing speeds with stable control features. It can be utilized to monitor and control the operation of individual wind turbines and battery management systems.

Services for a lifetime of plant efficiency

Design & Engineering

Early involvement and collaborative project execution lowers the overall risk of the project. Yokogawa strives to understand the goals of each project upfront and to secure a firm ground for ongoing teamwork. Throughout execution, Yokogawa secures strict quality gates based on proven procedures.

Front-End Engineering & Design (FEED)
Main Instrumentation Vendor (MIV) Services



“Seeing is believing”

Ts. Bayarbaatar, Ex-Executive Director of the 4th Thermal Power Plant, Mongolia

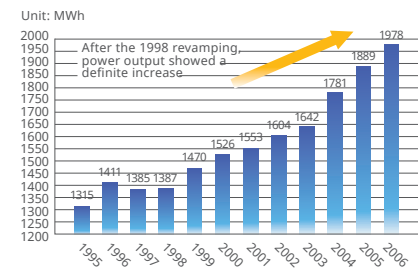
“Seeing is believing. Whatever beautiful things sales people say, I will not believe until I see them at work. When we experienced the plant trip, I learned what makes Yokogawa different from others. I admire their sincerity and devotion toward customers.”



8 × 420 t/hr, coal fired, plant revamping

A more stable and robust power supply
The re-instrumented boilers realized both higher stability and increased throughput, assuring a stable energy supply.

The 4th Thermal Power Plant



Reduction of malfunctions and accidents
Since the renovation, equipment malfunctions have dropped dramatically, eliminating costly plant downtimes.

Installation & Commissioning

Good coordination between multiple suppliers and engineering teams is the key success factor in commissioning. Yokogawa ensures both human collaboration and technical integration throughout the project life cycle.

- Site Engineering
- Turn-Key Services
- Integration Testing
- Commissioning Services



Operation & Optimization

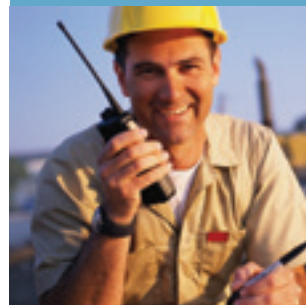
Ongoing adaptation and optimization requires continued collaboration. Yokogawa keeps in close touch with your plant through 24/7 operation support and expert consultation services.

- Optimization Consulting
- Online Diagnosis Support
- 24/7 Operation Support
- Operator Training



Revamp and Expansion

Complex revamp/expansion projects test the alertness, care, and skill of both the user and the supplier of automation. Yokogawa delivers practical engineering solutions with professional care, modernizing and expanding your plant with minimum disturbance to your business.



Maintenance and Upgrade

Be it diagnosis, root cause analysis, or predictive maintenance, practical solutions are in short supply. Yokogawa brings you the tools and services that help you take concrete actions to improve the effectiveness of your plant assets.

- Asset Optimization
- Operation & Maintenance Services
- Life Cycle Solutions
- Standard Knowledge Base



An industry leader on a clear path

In 2002, Eraring Energy began a revamp process to replace the original 1970s design hard-wired electronic control equipment and computer equipment at its Eraring Power Station, one of Australia's largest. Inviting and evaluating proposals for the latest equipment from the major control systems suppliers, Eraring Energy chose Yokogawa.



“For flexibility, experience and commitment, we selected Yokogawa”

Michael Mortiss, Project Manager of Eraring Energy

“Our decision to carry out the revamping project was based on the need to maintain a competitive advantage in the Australian deregulated electricity market. Maximizing plant availability for at least another 20 years, timely returns to service of each unit, and efficiency gains were also significant project drivers.”

“While there are several very capable control systems vendors, Yokogawa provided the most completely integrated solution of plant control system, training simulator, plant asset management system, and plant information and management systems. Yokogawa's flexible approach to design and implementation of large power plant revamp projects, team of experienced power plant engineers, and commitment to meeting all-important project outage schedules were further reasons for selecting Yokogawa.”

“We had already purchased other Yokogawa equipment such as transmitters and paperless chart recorders for our plant, and had received excellent service and on-going support.”

“The ability to operate flexibly gives us a competitive advantage”

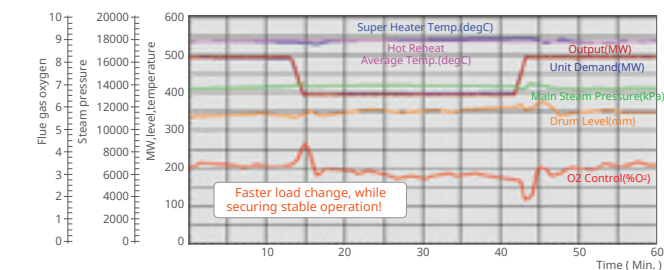
Jeff Hogan, Instrument and Control Team Manager of Eraring Energy

“Yokogawa took advantage of the flexibility of its equipment to suit the existing installation. Where possible, the new equipment slotted into existing cabinets, reusing existing field cables, terminations, cabinets, and connectors. New equipment was wired and tested in the factory. This avoided disturbing most existing cabling and greatly sped up installation and commissioning times.”

“The new control equipment makes fault finding a breeze, while the new graphic displays show us all the details we need.”

“The asset management system allows us to directly monitor and manage all smart field devices from our workshop.”

“The renovated units are now more flexible and responsive than before, giving the station additional advantages in a highly competitive electricity market. The refitted control room is state-of-the-art and provides a quiet and stress free operating environment for our staff.”



Test result of control performance (Load change 66 MW/minute, fixed pressure)

“Expectations exceeded, our plant was back in operation ahead of schedule”

Michael Mortiss, Project Manager of Eraring Energy

“Yokogawa has exceeded our expectations, bringing each revamped unit back into reliable service ahead of schedule.

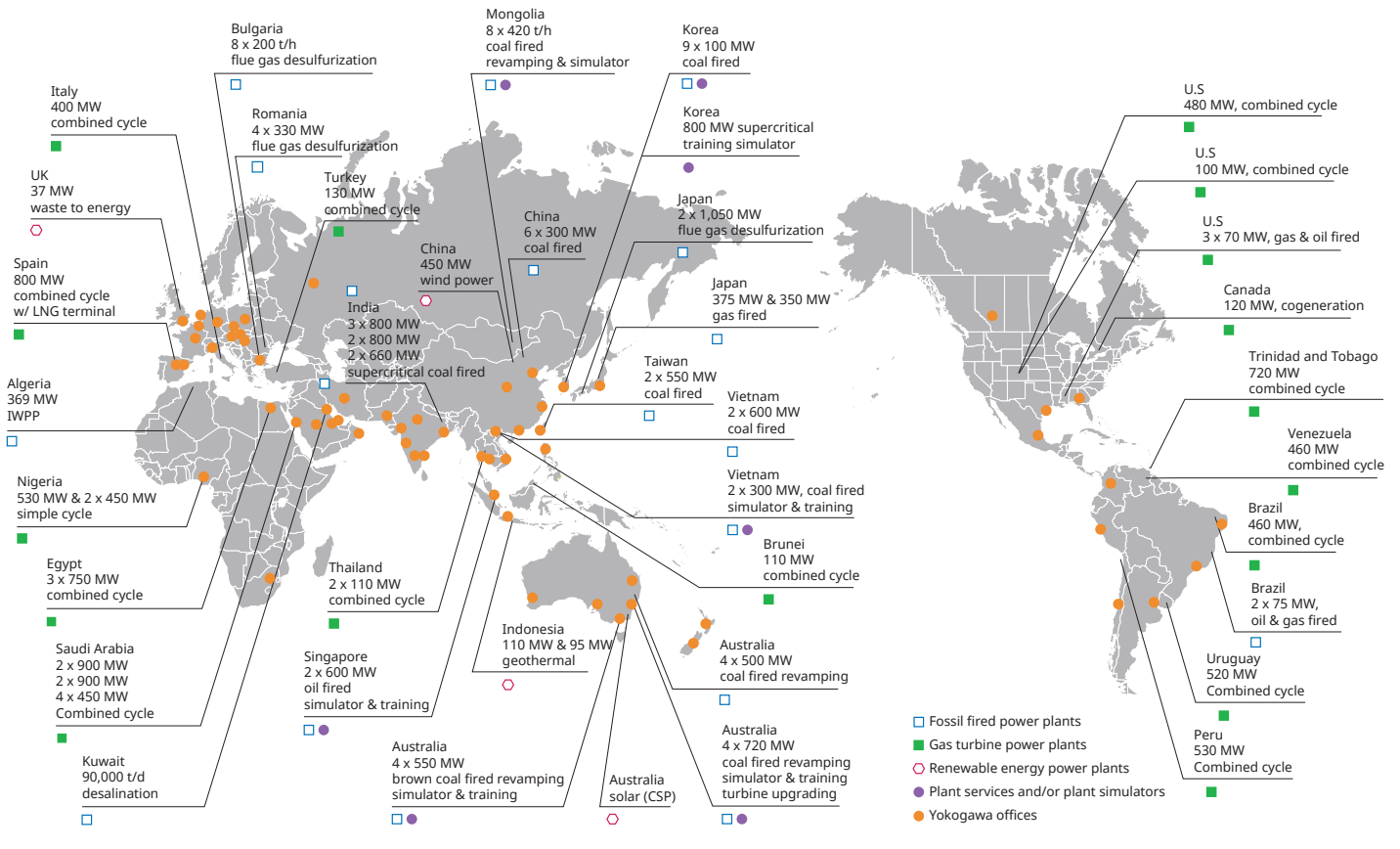
Utilizing a full replica simulator, our engineering team and Yokogawa fully tested the new logic and control configurations before they were loaded on the actual plant. This significantly reduced the time needed for site commissioning, and avoided plant trips during commissioning. Being thoroughly trained on the new screen-based control system training simulator, our operators were well prepared for the new control scheme in time for plant commissioning. This assisted in ensuring an uneventful, smooth return to service.”

“Supported by the high-level operational and maintenance diagnostics, together with strong local support from Yokogawa, we are sure that Eraring Power Station will secure high plant availability for a further 20 years.”



Let's co-innovate your business!

Yokogawa's representative power projects



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