INDUSTRY: Renewable Energy

Company: RK Powergen

Product: EurothermSuite and IOM DCS

www.RK Powergen Pvt. Ltd

Diverse challenges

The plant had to be designed as a sustainable environmental system adhering to constraints imposed by operating costs, securing proper environmental monitoring, and ensuring plant safety.

RK Powergen needed systems that integrate process parameters from different units for monitoring and controlling the entire plant processes

We help to make a new 20 MW Biomass Power Plant a success in India

Our client RK Powergen planned the building of a new plant designed to utilise local waste as biomass fuels such as the rampant wasteland shrub Prosopis Juliflora, Coconut Residues, bark, eucalyptus lops & tops, ground nut husk, paddy husk, fig stalk, betel nut husk, sunflower stalks, and tamarind husk.

The demand in urban, industrial and commercial sectors of the economy in India for energy far outstrips its availability.

The industrial sector today consumes approximately 35% of total electricity generated in the country. As fossil fuels are limited and have adverse environmental impact, use of non-conventional energy sources such as Biomass energy plants are on the increase.

The unique feature of this project is that it also employs an air cooled condenser instead of water cooling towers.

Hence, this project directly contributes to reduce Greenhouse Gas emissions which arise from burning fossil fuels. This project also helps reduce specific water consumption by using air cooling instead of water cooling and reduce specific solid waste generation by burning the solid waste. Also, with Invensys Eurotherm, appropriate environmental performance monitoring and control systems have been installed.

This power plant uses Biomass as fuel to generate power. Local waste such as a local wasteland tree, Prosopis Juliflora and other waste such as the husks of locally harvested nuts , lops and tops of the eucalyptus tree and sunflower stalks are used as fuel to generate steam in the Boiler of 100TPH capacity.

The Control System comprises our powerful Eurotherm Suite Distributed Control System, Eurotherm T940 Process Supervisor and 2500 I/0 units and Eurotherm T640 Integrated Loop

INDUSTRY: Renewable Energy

Company: RK Powergen

Product: EurothermSuite and IOM DCS

www.RK Powergen Pvt. Ltd



Typical waste reused as Biomass fuel—Betel nut husks, the tops and lops of the eucalyptus tree, sunflower stalks ,

processors.
The T940 Process Supervisor controls the entire plant by acquiring data through Eurotherm subsystems. Eurotherm Suite stations monitor the complete plant and provide live data to operators.
Besides monitoring the plant data, the Eurotherm Suite Development station is also used for configuration, development, database building and maintenance.
These stations communicate to the powerful Eurotherm Process Supervisors over a high-speed network. The Process Supervisors are configurable strategy engines performing both closed loop and sequential control.
The system integrates process data from different instrumentation devices and provides one source of integrated information.

Objectives

- To create new rural income resulting from the sales of biomass fuels
- Availability of power in the region of the project is expected to improve, leading to enhanced local agricultural and industrial activities.
- At a national level, use of surplus biomass for generation of grid quality power reduces the need to import fossil fuels to meet the country's growing energy demand.
- To enable environmental monitoring and control of plant data. This can then be used for best configuration of the systems
- The automation of the boilers and tank farm for a biomass power plant to increase efficiency and productivity optimization.
- Accurate analysis of problems immediately enhancing maintenance productivity and reducing downtime
- Ongoing historical database building to continually improve production throughput.

Challenges

Diverse operating challenges because of involvement of variety of units, including processes for power generation, steam production, and chilled water distribution.

- The plant meeting sustainable environmental system adhering to constraints imposed by operating costs, securing proper environmental monitoring, and ensuring plant safety.
- Finding systems that integrate process parameters from different units for monitoring and controlling the entire plant processes

Scope of Supply

- Eurotherm Suite Distributed Control System
- DCS I/Os Over 204 AIs, 30 AOs, 352 DIs, 232 DOs
- Eurotherm T940 Process Supervisor
- Eurotherm T640 Integrated Loop Processors 4 Nos.
- Eurotherm 2500 Data Acquisition Units 14 Nos.

Customer Benefits

- Plant wide view for operators enabling accurate analysis of all processes
- Accurate drum level control of boiler resulting in consistent, quality steam output optimizing the fuel consumption

INDUSTRY: Renewable Energy

Company: RK Powergen

Product: EurothermSuite and IOM DCS

www.RK Powergen Pvt. Ltd

the wasteland shrub Prosopis Juliflora, rice husks from the paddy fields and betel nut leaves & fruit

- Decrease in air pollution due to better combustion control
- Efficient management of tank farm resulting in better and more effective utilization of manpower

Solution

Control Loops implemented:

- Drum level control
- Furnace pressure control
- Superheater (SH) temperature control
- Combustion control
- Over Fire Air (OFA) fan pressure control
- Soot blower steam pressure control
- Dearator pressure, level and overflow controls
- CEP minimum recirculation control
- Hotwell level control
- Auxiliary steam pressure & temperature control
- Turbine bypass control
- Air- cooled condenser pressure control

Process Mimics implemented:

- Boiler
- Turbine
- Condensate system
- Feed water system
- Flue gas system
- Steam system
- Cooling water system
- Fuel and Air system

Invensys Operations Management Eurotherm Suite DCS solution

Operations Server and Viewer are supplied as part of the Eurotherm Suite Distributed Control System. Operations Server provides server connectivity between the control network and the plant network. Operations Viewer provides a defined interface using Wonderware InTouch and allows data distribution across geographical and organizational boundaries.

Applications can be deployed across the network and, simple-to-implement distribution features eliminate the need to duplicate data.

To simplify configuration and testing, a fully engineered and tested Eurotherm Suite application is supplied including operator displays, trending, alarming and user-centric security.

Process Supervisor

- Powerful controller with large application capacity
- Redundant processor option with automatic and seamless changeover
- Open I/O network with simultaneous support for Profibus and Modbus
- Supports Ethernet, ARCnet and serial control network architecture
- Powerful strategy engine for closed loop and sequential control
- Redundant I/O communication support
- Peer-to-peer control network for node and supervisory communication
- Reduced wiring cost with distributed I/O
- Flexible architecture
- Hot swappable automatic initiation

T940 Process Supervisor is a powerful and configurable strategy engine capable of performing both continuous and sequential control. The optional redundancy of processor modules provides high availability solutions for process control and the live replacement of processor modules prevents any interruption of the process.

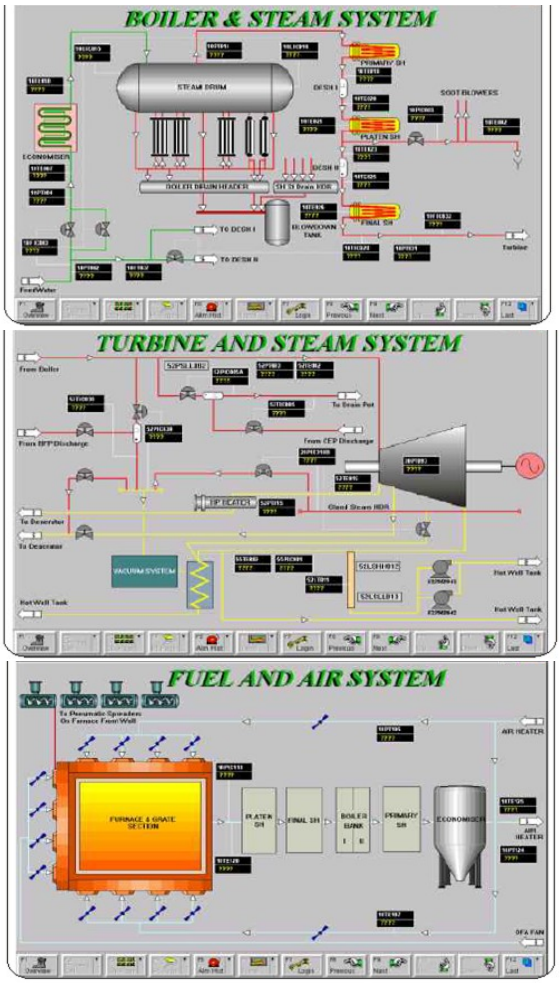
The Process supervisor provides an open I/O network with support for Profibus, Modbus. The advanced peer-to-peer communications

INDUSTRY: Renewable Energy

Company: RK Powergen

Product: EurothermSuite and IOM DCS

www.RK Powergen Pvt. Ltd



on ALIN, together with the open I/O network delivers a distributable system.

2500 Data Acquisition & Multi Loop Control Unit

- Advanced PID Control
- Single loop integrity
- Physical distribution
- Local processing
- Direct interface to temperature sensors
- Plug-in modules
- Expandable
- Hot swappable
- Accurate control independent of PLC Scan
- Greater fault tolerance. Simple fault finding
- Reduces wiring cost
- Modbus / Profibus communications
- Only pay for the I/O required
- More accuracy less cost
- Low ownership cost

T640 Loop Processor

- Micro DCS configurable controller
- Supports continuous and sequential functionality
- Large range of standard applications
- High level process I/O - thermocouple I/O
- IP65 panel mounting seal
- Supports multiple networking for easy integration
- Secure access to engineering settings
- The T640 Loop processor is in itself a range of controllers.

In its simplest form, M006, the controller is supplied with a suite of pre-configured, documented, single and dual loop control structures which only require parameterization. In its most advanced form, M004, it is a multipurpose four-loop controller configured for continuous control using a powerful set of function blocks supported by SFC for applications requiring sequential or state dependent control.
The block structure architecture supported by graphical configuration tools, makes complex continuous control strategies easy to develop and maintain.

*Authorised by Dr S Arumugam, Company Director | Agreement to use as approved
● Written story ● Verbal Reference ● Website story ● Press Release ● Advertising ● Company Name
Written by Kate Merrick Invensys Eurotherm Global marketing communications. Email: kate.merrick@invensys.com