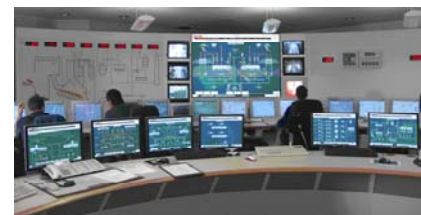


Industrial^{IT} System 800xA for Enel's Torrevaldaliga Nord (Civitavecchia) Power Station



The Plant

The Enel's power station in Torrevaldaliga Nord (Civitavecchia) is the most important clean coal plant being built in Italy at the moment. With three 660 megawatt units, which will start to operate at the end of 2008, it will replace a previous oil plant. Emission control will be ensured by high-efficiency devices, among which denitration and desulphurisation systems and bag filters to dampen the particulate, as well as completely closed-in coal unloading, transfer and storage systems.



ABB

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Scope of Supply

ABB is Enel's partner in this construction, which is an important step forward on the road to re-balancing the mix of fuels used by the company's installed power stations. The order assigned to ABB in December 2005 regards the supply of the DCS (Distributed Control System). The order includes design, supply, erection and commissioning of the components and the automation instrumentation, as well as the supervision and control system of the whole plant.

The project in fact is an ensemble of packages. The basic order regards the automation system of the whole power production part from Enel. The supply includes the Emergency Shut Down systems based on the proven ABB's Plantguard TMR technology which ensures safe and reliable operation of the most safety critical parts of the plant.

Various other orders are added to this. ABB is carrying out the automation of the super-critical type boilers, including the burner, blowing, denitration and ammonia treatment systems for Ansaldo Caldaie.

For Mitsubishi, ABB supplies the automation of the desulphurisation plant of the power station, and for Magaldi the automation of the ash discharging system. Furthermore ABB is responsible for the automation part of the temperature regulation and methane gas pressure control station.

For the electrical systems ABB supplies the protection relays, the connection SCADA and the parallel changeover systems with busbars. The medium voltage switchgear (350 UniGear panels) for all the compartments is rated at 6 kV, 3,600 A, 50 kA, internal arcproof 0.5".

Among the large companies which reached the last stage of the tender, only ABB could boast an engineering structure located in Italy, able to follow up development of the entire project locally, and this factor was certainly taken into account by a customer like Enel. Economically advantageous, ABB's proposal represents state-of-the-art automation of power stations from the technical viewpoint.

In the designing of the DCS, ABB aimed at widely experimented technologies but with a new combination, offering maximum guarantees. For the "heart" of the automation system we opted for the Industrial^{IT} System 800xA with controller AC 870P and the S800 modules for I/O acquisition.



System 800xA allows extensive use of field-bus technology and it is employed in Torrealvaldliga project to connect over 500 field components, used for critical process automation and controls, furthermore all hardware I/O's are acquired through S800 remote I/O's modules connected on fieldbus.

ABB's experience is not limited to putting the automation system into service. We are also able to give the customer concrete support in starting up the whole power station and in carrying out sophisticated adjustments of the environmental protection systems.

The work is at present going ahead according to plan: procurement of the materials is at an advanced stage and software configuration of the system for the first units has started. By the end of 2006, the major part of the engineering and construction work for this unit will be completed. All the functional commissioning will be carried out at the ABB facilities in Genoa.



Redundant controller AC 870P (top right) and Remote I/O of System 800xA (below)

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The control system is made using the "System 800xA" technology. It therefore consists of System 800xA Operation operator stations (also called Process Portal A) and of AC870P controllers.

Here are some figures:

- 55,000 Hardware Input/Output
- 50,000 Software Input/Output
- 105 Controllers
- 2,300 Instruments, including pressure level & flow transmitters and temperature transmitters
- 500 Profibus users
- 500 Cabinets



Aerial view of Torrevaldaliga Nord

Going into greater detail, the following components of the system are found:

Aspect Server

It is the "heart" of the System 800xA. It contains all the information needed to work the operator interface, organised into the "Aspect Directory" according to the modern modelling approach for "Aspect Object". This approach allows you to have all the information perfectly integrated, easily accessible and changeable.

Connectivity Server

It allows access in real time to the AC870 P controllers or to other data sources (PLC Connectivity).

Composer Server

It is the engineering station for configuring and uploading the AC870P controllers.

Config Server

It receives the configuration of the AC870P controllers carried out by means of the Composer and sees to configuring the Connectivity Server and the Aspect Server in a congruent way. The Config Server acts in a fully "transparent" way for the user, i.e. no manual action by the user is needed to download the configuration to the Connectivity and Aspect Servers.

PGIM Server

It is delegated to making the historical archives of the data received from the Connectivity Servers.

Operator Workplace

It is the operator station of the System 800xA which allows you to act on and monitor the controlled system. The Operator Workplace accesses the data made available by the Aspect Server by the Connectivity Server (e.g. the dynamic values of a display) and by the PGIM Server (logs or trend files) in a totally transparent way for the operator.

Engineering Workplace

It is the work station dedicated to configuration of the System 800xA. The Engineering Workplace accesses the data made available by the Aspect Server and allows their modification according to the configurable user profiles.

AC870P Controllers

These are process controllers of proven sturdiness and reliability. The controller is fitted with CPU of Intel Pentium Mobile type at 333 MHz, with 64 MByte of SDRAM.



Modern power plant control room based on System 800xA

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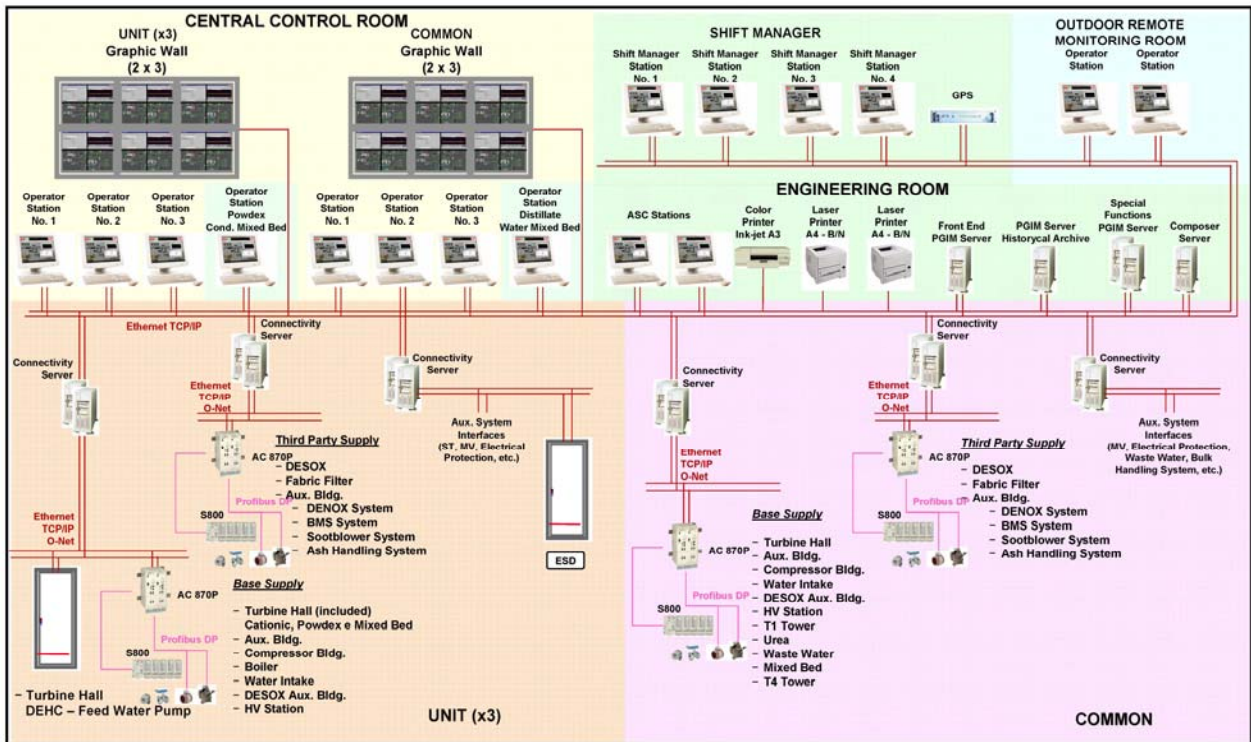


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