

System 800xA Power Management System (PMS) Energy efficiencies for Thailand's largest gas group



A country in charge of its energy resources is a country in control of its future.

To this end, Thailand embarked on harnessing natural gas to produce energy for its growing industries and reduce the country's dependence on imported crude oil. Since 1981, when it first produced natural gas, the country has built five natural gas separation plants to extract from natural gas other gaseous elements to be used as feedstock in the petrochemical industry.

Fast forward to today, PTT has built the new Gas Separation Plant Unit 6 and Ethane Separation Plant (GSP6/ESP) at its Rayong facility. It was commissioned in Q3 2010.

However, PTT looked beyond mere energy creation. PTT looked to technology that will manage the plant's energy supply and consumption. It contracted ABB to provide a System 800xA-based Power Management System (PMS) for this new plant.

About PTT Public Company

PTT is a fully integrated natural gas company in Thailand that conducts upstream petroleum exploration and production activities, procurement, natural gas transmission, separation and marketing. Exploration and production are undertaken by PTT Exploration and Production Public Co. Ltd. (PTTEP), which plays a vital role in natural gas exploration and production activities in Thailand.

The PTT Gas Business Group is tasked with natural gas procurement, transmission, distribution of natural gas and products from gas separation plants.

PTT Gas is efficiently harnessing precious hydrocarbons with the use of ABB's System 800xA-based Power Management System.

Rationale for the project

PTT was keen to procure for the plant a common platform for process control, safety, power generation, utility control and power management. PTT's requirement was a solution that will enhance its existing services while enabling it to integrate new technology that will improve efficiencies and productivity. The challenge posed was the provision and integration of the solution fast enough and profitably.

Product solution

ABB's System 800xA-based PMS is designed specifically for the most energy-intensive sectors, including natural gas processing. It provides a common automation architecture for integrated system solutions that include safety, instrumentation, electrical and analytic systems.

The PMS solution controls and supervises PTT's power generation and supply to ensure a stable and optimized electrical network. The PMS solution allows for contingency-based fast load shedding, power control and SCADA functionality for the plant's electrical system, among others.

Its fast load shedding functionality (40 to 150 microseconds, depending on the configuration), based on fast network determination and energy balance calculations, ensures availability and continuous supply of power to mission- and safety-critical operations during blackouts or loss of power supply. Conversely, when demand exceeds power supply or import thresholds, load shedding actions can be invoked on a pre-set priority basis.

The Power Control function allows the sharing of active and reactive power between the different generators, reactors and tie-lines, ensuring that they operate within their specification limits.

Specifically, the PMS system for PTT has the following functions:

- Load Sharing and Load shedding
- Power Restoration
- Mode Control
- Synchronization
- Intelligent Motor Control System (IMCS)
- Event and Alarm handling
- Communication (OPC) with MicroSCADA system
- MODBUS communication with generator and turbine

ABB's solution is based on 14 redundant AC 800M controllers and has 3,000 S800 I/O channels. The System 800xA is connected to MicroSCADA via OPC and to the generator and turbine via MODBUS.

The PMS system for this new plant monitors the following primary equipment:

- 115 kV
- 33 kV
- 11 kV
- 0.4 kV
- 5 gas turbines with generators (GTGs)



PTT is the first company to introduce natural gas as a main fuel of production process and supporting processing units.

“ABB's PMS solution is very unique. Furthermore, ABB has a lot of references. Of particular importance was one made by Thai Oil PLC, a subsidiary of PTT.”

Rattikool Piyavongwanich
Project Manager
PTT Thailand

Energy savings

In an energy-hungry industry such as gas processing, energy management is vital. The volatility of energy costs, growing environmental consciousness and more stringent legislation are some of the push factors for improved energy generation, usage and management.

However, even without these regulatory and environmental pressures, an energy management solution wins the dollars-and-cents argument. With PMS, PTT is now able to locate savings potentials, obtain information on the status of the plant and the degree of utilization, draw conclusions on the power behavior trends of different operating units and ultimately adjust the parameters in which these run.

PMS: A deep history in the oil and gas space

ABB's System 800xA-based PMS solution within the Oil and Gas space has a track record of successful implementations, including offshore platforms, floating production, storage and offloading vessels (FPSOs), refineries, LNG complexes, and large petrochemical complexes.

PTT selected ABB's solution not only for its features, but also for its long reference list. "ABB's solution is very unique. Furthermore, it has a lot of references. Of particular importance is Thai Oil PLC, a subsidiary of PTT," said Mr. Rattikool Piyavongwanich, PTT's project manager.

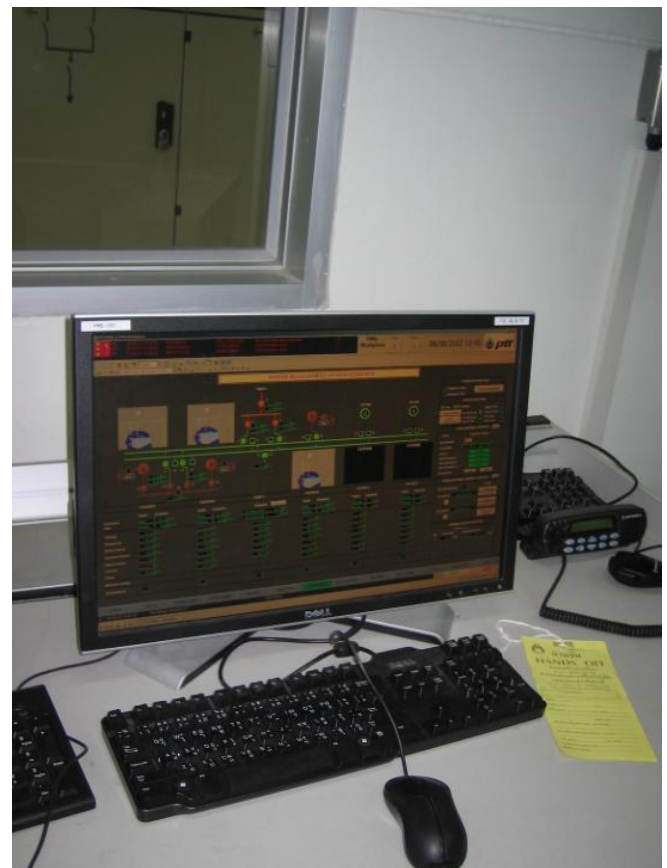
ABB, with its long-standing history of providing advanced automation and power solutions, products and services to the oil and gas, petroleum and chemical industries, has gained profound understanding of these industries' requirements and demands.

In the 1980s, ABB began crafting an energy and power management solution that addresses the unique and specific needs of these enterprises.

The result is System 800xA-based Power Management Solution — the culmination of ABB's knowledge and application of automation and power technology in these domains.

More than control and management capabilities, the PMS solution provides integration of diverse sets of functions in industrial plants.

With System 800xA as the backbone, ABB offers a full suite of automation and IT solutions for the hydrocarbon industry, enabling oil and gas customers to operate their assets in an efficient and secure way.



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