



# Gas turbine power plants

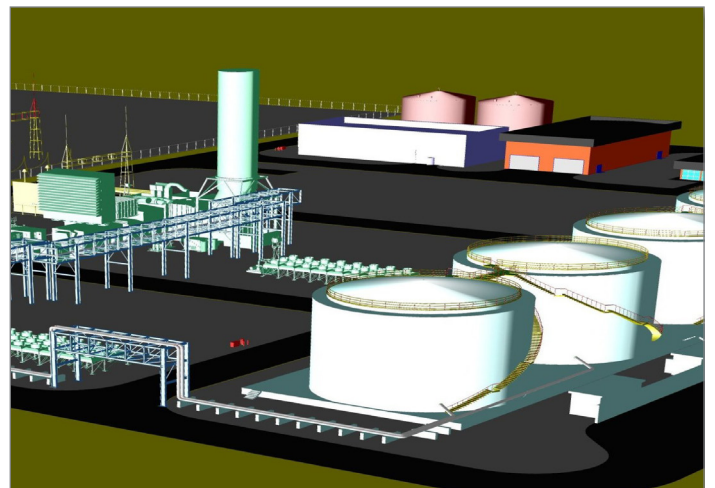
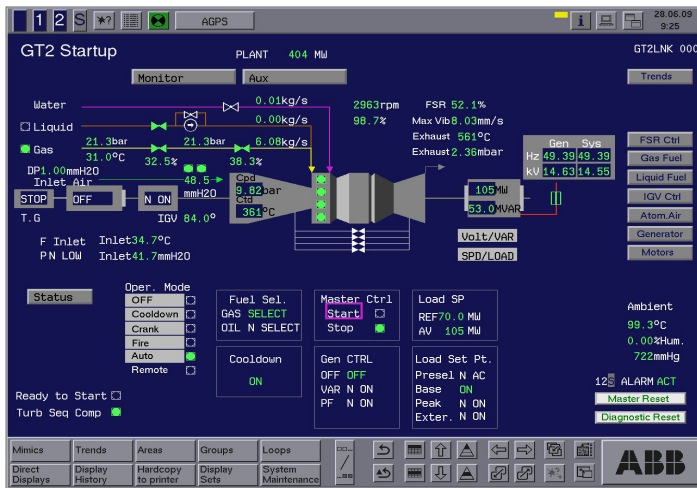
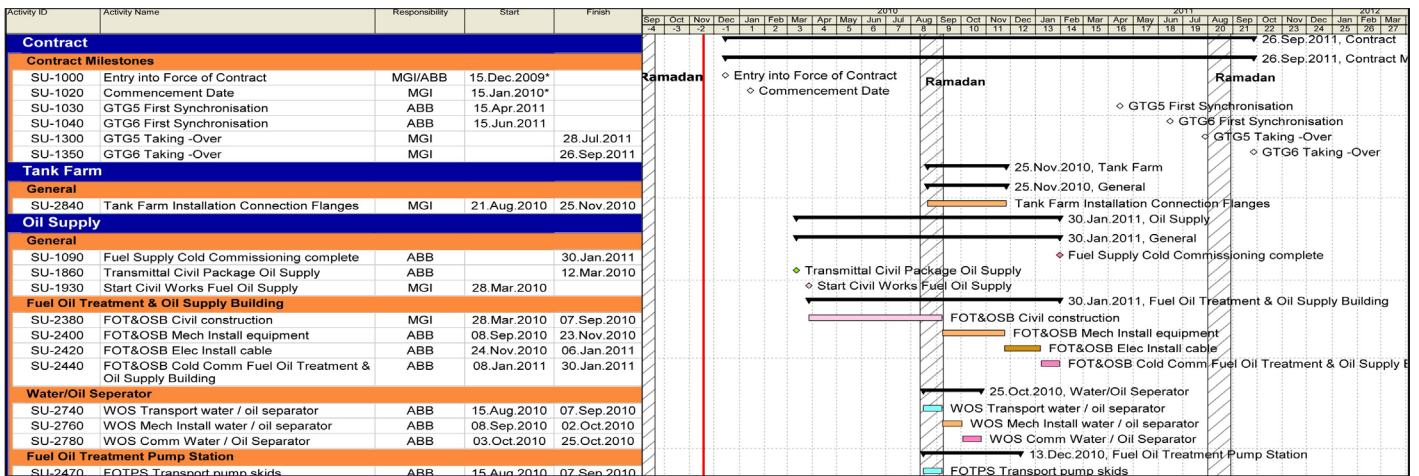
# Gas turbine power plants



## What makes gas turbines so attractive for power generation?

ABB has a longstanding tradition and extensive experience in erecting gas turbine plants and applying gas turbine technology. The 4MW, Emergency Power Plant<sup>1</sup> built by BBC for the Swiss town of Neuchâtel in 1938 is generally considered a milestone in the commercial use of gas turbines for power generation. Since that time, gas turbine technology has developed rapidly and has become more flexible in terms of its utilization in power generation.

ABB has erected numerous gas turbine units, making use of its longstanding expertise and knowledge in the area of gas turbine technology. Today, tailored solutions fitting to the needs of fast and demand-oriented power generation are of paramount importance to both investors and plant owners. Extremely short installation times, low investment costs and an enormously growing volatility in the electrical distribution have been the primary driving forces in applying this technology in order to achieve higher levels of reliability in the power grid. Current studies and analyses carried out by recognized professional associations unanimously emphasize the significance of a reliable minimum of power output from the conventional power plant fleet in order to assure stability in transmission grids that are increasingly fed through the power generated from renewable decentralized energy sources.



### Tight schedule

The ambitious goal of investors and plant owners is to minimize the implementation times of the projects and to start commercial operation of the plants as soon as possible. This is especially the case with simple cycle power plants, since they are primarily used for covering strategic demands, as in the event of power shortages or for peak load demands. On the customer side, a number of prerequisites need to be fulfilled, for instance: provision of primary energy, along with the specification data, and the availability of water resources, e.g. for fire fighting purposes. Of similar importance are ecologically safe waste-water treatment facilities and an adequate power purchase agreement. Thanks to its global presence and its local partners all over the world, ABB's global 'Footprint' can help to set up the jobsites quickly and implement the projects successfully and on schedule.

### Standards

ABB can draw on many decades of practical experience in erecting such reference power plants and can use its standards, both in the technical and in the administrative fields, to create the necessary basic and prerequisite conditions. The best standards and tools, however, are worthless if you do not have the experts and experienced engineers who can handle them. In addition to its full-scale plant solutions, ABB can offer solutions for the various BoP systems (Balance of Plant) designed to extend and upgrade existing gas turbine systems. Such solutions can comprise involving all disciplines, i.e. civil engineering, mechanical and electrical engineering, as well as the necessary automation competencies.

# Gas turbine power plants in power generation



## Expertise

Process expertise and overall plant expertise are the key to a successful development of gas turbine projects. Already in the offering stage, it is important for the Customers to know that high-quality consulting support based on coherent and cost-effective concepts are available. Specialized expertise is vitally important in all technical disciplines (construction, process engineering, mechanical engineering, electrical engineering and automation engineering) throughout the entire value-added chain – from sales to project management and engineering up to the installation and commissioning of the plant, including the site management activities. Special attention has to be paid to a consistently high level of quality and a professional concept in order to comply with the high requirements of the provision of occupational health & safety and the environmental requirements applicable to the construction sites. The entire offer capability is complemented by a field-proven service portfolio, thus providing optimal protection of the investments made and a high level of operational availability for the plant, and last but not least, thanks also to tool-based maintenance concepts, stock-keeping of essential spare parts, and customized service agreements.

## Solutions

Besides the gas turbine, which is the main component of the gas turbine power plant, a number of auxiliary and ancillary systems are essential for the function of the plant, for example:

- Fuel supply systems
- Fire protection and fire-fighting systems, including hydrants and supply lines
- Water supply and treatment systems
- Electrical systems for energy output and substations
- Automation systems
- Emergency power systems
- Lighting systems
- Lightning protection and earthing systems

ABB can offer proven and tailored solutions for all of these components and systems. By seamlessly integrating the numerous individual components and systems, a safe and high availability of the overall plant is implemented and also defined operating properties which can satisfy the expectations of investors and final plant operators.

# Erbil, 1000MW



## Scope of deliveries and services

Site:	Erbil, Northern Iraq
Type of power plant:	1000MW gas-fueled power plant
Gas turbines:	General Electric Frame 9E
Completion stage I:	500MW in 2008
Completion stage II:	500MW in 2011

### Output data at 30°C

- Base load 114.8MW / GT (ISO 125MW)
- Gas heating value 45,134kJ/kg (38°C)

Project Management, complete engineering and design, factory testing, installation and commissioning.

Complete construction planning, incl. turbine basements and foundations, infrastructure, structural steelwork for tank farm, discharge station, buildings, manholes and channels.

### Mechanical systems

- Diesel oil system, incl. piping, oil discharge facility
- Tank farm 20,000 m<sup>3</sup>
- Gas supply, gas purification, gas reduction and gas control facilities, and flare
- Water management for supply of fire-fighting water, compressor cleaning, and building water supply
- Fire protection measures, fire-fighting and fire alarm systems, incl. pipe system, hydrants and spray systems

### Electrical systems

- 132kV high-voltage outdoor substation
- Unit transformer, a variety of transformers
- Generator lead, incl. generator breaker
- Various substations, medium and low voltage, DC voltage
- Earthing, lightning protection, lighting systems

Control equipment, incl. human system interface, telecontrol transmission station and camera monitoring system

# Sulaymaniyah II und III, 500MW



## Scope of deliveries and services

Site: Sulaymaniyah, Northern Iraq

Type of power plant: 500MW gas-fueled power plant

Gas turbines: General Electric Frame 9E

Completion stage II: 250MW in 2011

Completion stage III: 250MW in 2012

Output data at 30°C

- Base load 114.8MW / GT (ISO 125MW)
- Gas heating value 45,134kJ/kg (38°C)

Project management, complete engineering and design, factory testing, installation and commissioning.

Complete construction planning, incl. turbine basements and foundations, infrastructure, buildings, manholes and channels.

Mechanical systems

- Extension of diesel oil system, incl. piping
- Gas supply, gas purification, gas reduction and control
- Extension of the water supply facilities for fire fighting, compressor cleaning, and building water supply
- Extension of the fire protection measures, fire-fighting and fire alarm systems, incl. pipe system, hydrants and spray systems

Electrical systems

- 132kV high-voltage outdoor substation
- Unit transformer, a variety of transformers
- Generator lead, generator breaker
- Various substations, medium and low voltage, DC voltage
- Earthing, lightning protection, lighting system

# Dohuk, 500MW



## Scope of deliveries and services

Site:	Dohuk, Northern Iraq
Type of power plant:	500MW gas-fueled power plant
Gas turbines:	General Electric Frame 9E
Completion stage:	500MW in 2011

### Output data at 30°C

- Base load 114.8MW / GT (ISO 125MW)
- Gas heating value 45,134kJ/kg (38°C)

Project management, complete engineering and design, factory testing, installation and commissioning.

Complete construction planning, incl. turbine basements and foundations, infrastructure, discharge station, buildings, man-holes and channels.

### Mechanical systems

- Diesel oil system, incl. piping, oil discharge facility
- Gas supply, gas purification, gas reduction and control systems, flare
- Water supply management for fire-fighting water, compressor cleaning, and building water supply
- Fire protection measures, fire-fighting and fire alarm systems, incl. pipe system, hydrants and spray systems

### Electrical systems

- 132kV high-voltage outdoor substation
- Unit transformer, a variety of transformers
- Generator lead, incl. generator breaker
- Various substations, medium and low voltage, DC voltage
- Earthing, lightning protection and lighting systems

Control equipment, incl. human system interface, telecontrol transmission station and camera monitoring system

# Contact us

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