

## Combined Cycle Power Plant with Regasification Facility Realizes Stable Power Supply/BBE and BBG Plants

### BBE & BBG

**Location:** Bilbao, Spain  
**Order date:** 2001 (BBE & BBG)  
**Completion:** 2003 (BBE & BBG)  
**Industry:** Power and LNG

#### Background of the Project

In Spain, the demand for electricity and imported natural gas has been rapidly increasing, a trend that is anticipated to continue for years to come. To augment the country's energy supply, several new LNG regasification plants as well as combined cycle gas turbine plants have been constructed in Spain.

#### About the Bahia de Bizkaia Plant - BBE and BBG

To achieve a stable supply of gas and electricity for the country, the Spanish government decided to build the Bahia de Bizkaia Plant. Located in Bilbao, this plant consists of Bahia de Bizkaia Electricidad (BBE), an 800 MW gas fired combined cycle power station, and Bahia de Bizkaia Gas (BBG), a regasification facility with regasifiers having a total capacity of 2.7 billion cubic meters.

The Bahia de Bizkaia Plant is one of the most significant power projects to be carried out in this region. The project has been led and financed by Ente Vasco de la Energia, Repsol-YPF, British Petroleum, and Iberdrola S.A., with the total investment coming to approximately 600 million euros.

#### The Challenges and Results

**1. High availability (BBE and BBG)**

Both facilities aim to have high availability. The field-proven CENTUM CS 3000 distributed control system (DCS) ensures this by enabling the control and monitoring of the entire BBE power station. The BBG regasification facility is designed to operate 24 hours a day, 365 days a year without having to be shut down for maintenance. Yokogawa's highly reliable CENTUM CS 3000 DCS offers a high degree of redundancy that contributes to the entire plant's high availability.

**2. Unified operation of multivender control systems (BBE)**

At the BBE power station, General Electric Company gas and steam turbines have been installed and are controlled by the company's own turbine control system. The electrical equipment of the power station is controlled by another vendor's system. With its Unified Operator Interface (UOI), Yokogawa's CENTUM CS 3000 enables the seamless operation of each of these control systems. With the UOI solution, all of the actions required for the operation, management, and maintenance of turbines, the heat recovery steam generator (HRSG), and the balance of plant and electrical controls can be carried out from a single operator interface. The UOI also eliminates the requirement for operators to master the operation of multiple systems.

**3. (3) Flexible operation and reduced start-up time (BBE)**

The BBE power station is capable of working both at base load and at partial loads, which provides flexibility in the plant operation. In addition, to reduce the start-up time, 100-percent-flow by-passes were designed to start the gas turbine and the HRSG individually without starting up the steam turbine. The Yokogawa DCS for which the Spanish engineering company Siemsa Notre S.A. (SIEMSA) fully implemented the above operation logic has steadfastly supported the safe plant operation and smooth startup.

## Customer Satisfaction

The SIEMSA engineer commented, "We appreciate CENTUM CS 3000's operability and system reliability. With the UOI solution, the DCS controls use the same HMI system as the turbine and electrical control system, and there is no need for a dedicated communication gateway and separate screens. This significantly reduces the engineering time and costs."

**System:** CENTUM CS 3000/UOI (BBE); CENTUM CS 3000 (BBG)

**System configuration:** 4 x operator stations  
(BBE) 1 x engineering workstation  
2 x UOI (Cimplicity) servers  
4 x field control stations  
2,600 inputs/outputs  
1,800 Communication Signals

**System configuration:** 1 x Engineering Stations  
(BBG) 6 x Operator Stations  
4 x Control Stations  
1,500 Inputs/outputs  
2,500 Communication Signals  
1 x OPC Server

---

Yokogawa Electric Corporation

YOKOGAWA ELECTRIC CORPORATION

World Headquarters

9-32 Nakagyo 2-chome, Musashino-shi, Tokyo 180-8750, Japan

<http://www.yokogawa.com/>

Subject to change without notice

All Rights Reserved, Copyright © 2022, by Yokogawa Electric Corporation