

## Energy for the Island

### Malta power plant system solution with dynamic load shedding

#### ■ The company

Enemalta, the state-owned utility of Malta, holds a monopoly position on the Mediterranean island. The power supply region covers the entire 320 square km island, which lies 90 km south of Sicily, 290 km north of Africa, and almost exactly equidistant from Gibraltar and Alexandria in the middle of the countries bordering the Mediterranean Sea.

After a colorful history, Malta achieved formal independence in 1964 and final independence in 1979, when the last British troops withdrew.

In a referendum, the Maltese decided to join the European Union in May 2004.

The island of Malta is making many investments to prepare for its new role in the European Union – including its role as the bridge to North Africa.

#### ■ The starting situation

Since Malta currently still does not have any connections to the mainland and is supplied by only two power stations, it is an island power systems in the truest sense of the word.

Because the summer of 2003 was extraordinarily hot, Enemalta was not always able to ensure a steady power supply. The utility needs to expand its capacities and improve operational reliability and availability of the Marsa power station.

Malta is made up of stony ground and has few natural groundwater resources that could store precipitation, which is meager anyway. As a result, the growing need for drinking water can be met predominantly through desalination plants. These vitally important stations account for a major part of energy needs. Other major loads are airconditioners in the tourism industry and in Maltese homes, shipyards, harbors, and fish processing plants.

Relying on two power stations, Delimara and Marsa, Malta's power engineering is in a weak position. If one generator fails during peak loads, serious network disturbances may occur.



Fig. 1 Traditional transportation still exists in Malta, but it is mainly for tourists.

#### ■ The concept

As Enemalta makes necessary investments, the first step in strengthening the Marsa power plant should be to modernize the generator protection with synchronization and to modernize the two associated primary distribution switchgear for power distribution with appropriate power system protection and busbar protection.

Enemalta places great importance on the availability of the power-engineering parts of the power plant. In addition to a reliable protection concept, which includes a redundant station communications bus, redundant master units should also be provided. In the case a generator fails, then load shedding, prioritized in advance, must dynamically balance the decrease in electrical energy to ensure the stability of the power system.

Siemens was able to successfully win out over its competition through its overall technological solution.

■ *The special advantages*

Siemens was awarded the contract for several reasons, including fulfillment of the specification, the favorable cost/performance ratio, and our partnership with the customer. However, the integration of all protection components for the generators, busbars, lines, and transformers plus the network into a complete system was also very important. What also helped was great teamwork with our colleagues from our Medium-Voltage division from the time the bid was prepared until the contract was awarded. The Siemens solution integrates components for primary distribution switchgear, generator protection (7UM62), busbar protection (7SS52), power system protection (7SJ63 and 7UT612/13), and dynamic load shedding into a complete system.

■ *New dynamic load shedding concept*

Ultimately, the decisive factor for the awarding of the contract was PTD PA's plan to implement a completely new dynamic load shedding concept in a power station for the first time. The combination of distributed logic in the SIPROTEC 4 protection and master units and the new calculation procedure before any fault event makes it possible to have response times of less than 50 ms for dynamic load shedding.

■ *Partnership to success*

During the project launch meeting in March 2004, the customer and the Siemens project managers discussed open items together and clarified them on site by mutual agreement. Together they agreed on the new parts and the parts to be expanded in the power station.

The launch meeting also included a project organization chart with responsibilities and contacts, as well as a mutually determined schedule with fixed milestones for Siemens and the customer, thus laying the basis for successful project implementation.

■ *Conclusion*

By modernizing the Marsa power station, Siemens is making an important contribution toward improving the power-engineering infrastructure of new EU member state, Malta, which is on the right path to becoming the hub of the Mediterranean.

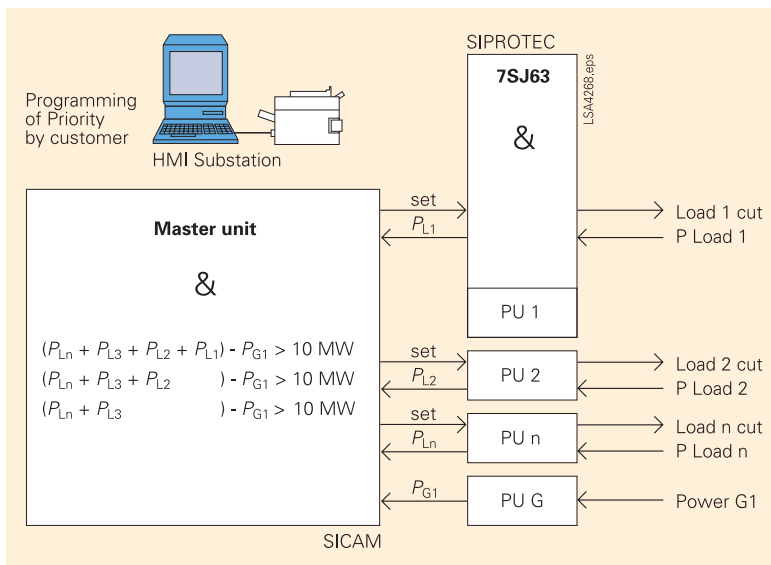


Fig. 2 Dynamic load shedding concept