



CASE STUDIES

HIMOINSA
A **YANMAR** COMPANY

Energy for the largest port in the Black Sea | Port of Constanța (Romania)

HIMOINSA supplies generator sets for the cranes that load and unload the containers



SUMMARY:

Location: Port of Constanța (Romania)

Installed power: 2X458 kVA in PRP

Generator sets: 2 HW-400 T6 units

Special configuration: Gensets specially configured for port applications, synchronized with the on-board systems of the cranes and able to withstand major load variations and sub-zero temperatures.

Client: PACECO España

Covering an area of almost 40km², the Port of Constanța, in Romania, is the largest port in the Black Sea. It is able to handle 100 million tons of cargo per year. In addition to its privileged location, the Port is also connected to two pan-European transportation corridors that link Europe to Central Asia. Each day, some 200 containers are transported from the Port of Constanța through the Danube to countries in Central and Eastern Europe such as Bulgaria, Serbia, Hungary, Austria or Germany.

HIMOINSA generator sets supply power to two Rubber Tyred Transtainer® (RTG) cranes of PACECO España, a company that designs, manufactures and develops container handling equipment. The cranes have been designed with state-of-the-art technology to optimize container handling in the port's terminals, to ensure operational safety at all times and to enable all operations to be automated in the future.



OBJECTIVE SOLUTION

To supply continuous power to the Transtainer® RTG cranes that load and unload containers in the port, machines designed to work 24 hours a day, 365 days a year, with very brief stops for maintenance and continuous container loading and unloading cycles. The generator sets must be perfectly synchronized with the cranes' on-board systems.

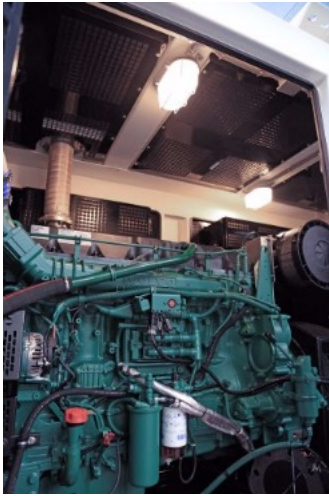
The HIMOINSA Engineering team, together with PACECO, has designed the gensets to tailor them to the specific needs of RTG applications. Both generators are ready to work very hard, with very large peaks in demand for power. To cope with these abrupt load variations and to minimize running costs, the design incorporates engine speed control and cooling optimization solutions, intended to reduce fuel consumption, resulting in an improvement of approximately 20%.



Technical specifications:

To meet the needs of a seaport market that is increasingly demanding as far as noise is concerned, the gensets are housed in a **soundproofed canopy** and its brackets and anchor points to the main crane chassis have been designed to withstand the force exerted on all three axes as a result of motion during the transportation of the crane and when it is loading or unloading containers.

As they are installed in moving vehicles, the **fuel tanks**, with sufficient capacity for a full day's work, incorporate air chambers that prevent the fuel from swaying to and fro, which might otherwise cause errors when reading the sensors not to mention the premature mechanical fatigue of the tank itself and its components.



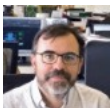
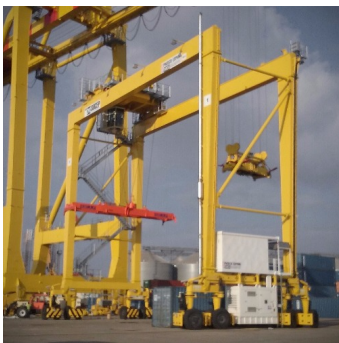
On the other hand, their design has been adapted to make it possible to carry out **maintenance** work on the generator set on the actual crane itself. Coolant changes are carried out from the side of the generator set by means of an electric pump, thereby removing the need to access the interior. Lighting has been added to the control panel and in the interior of the genset to facilitate supervision and control tasks.

As the application requires the equipment to cope with very abrupt load variations, an oversized **alternator** was included in the genset with a non-standard voltage controller, which provides the dynamic response that PACECO España was looking for.

The gensets' **control unit** communicates with the crane's PLC while the units have been fully integrated with each crane's SCADA and on-board systems. This ensures a smooth operation and makes it possible to foresee how the genset will be used and to schedule maintenance. According to Fernando Monje, Engineering Director at PACECO España, "as equipment designers and manufacturers, PACECO looks for the best possible integration between systems and on-board subsystems. Close collaboration between the engineering teams of both companies has made it possible to achieve the desired level of integration, both in mechanical and electric and electronic terms."

Sub-zero temperatures:

Given the climatic conditions of the Port of Constanța, the genset is prepared to work at temperatures as low as **20 degrees below zero**. To make this possible, a heater has been included for the fuel tank, lubricant and coolant, and a system has been installed to prevent condensation in the alternator and the ice formation.



Fernando Monje, Engineering Director, PACECO España.

"HIMOINSA has designed a solution in line with the requirements of PACECO España. We worked in close collaboration to introduce a series of improvements in this new generation of generator sets for our RTGs, making them truly cutting-edge".

