Due to their convenient geo-strategic locations, Portuguese ports are the gates to Europe and the world. Such is the case of the deepwater port of Sines, which dedicates an area of more than 2,000 ha to industry and logistics, has a container handling capacity of approximately 1 million TEUs (twenty-foot equivalent units, or standard containers), and thus is the largest port for general freight and containers on the Iberian Peninsula. Container shipments are booming in Sines: its growth rate of 32 percent last year was the second-largest in Europe, exceeded only by Gdansk.

**Gradual modernization with IDS**

Port operator PSA Sines commissioned Siemens to modernize the automation, drive, and monitoring technology as well as the management systems of the current ship-to-shore (STS) cranes at Terminal XXI. The modernization is being carried out in several stages of expansion. In the first stage, the container cranes STS 1 and STS 2 were equipped with rugged AC motors, Masterdrive converters, and Simatic S7-400 controllers with the Simocrane CMS monitoring software. During the second stage, PSA purchased three new cranes equipped with Integrated Drive Systems (IDS), which combine Simotics motors, Sinamics S120 converters, and fail-safe Simatic S7-300F PLC. Simocrane monitors and controls these cranes as well. In the third stage, which will be completed in 2015, three more cranes have been equipped with IDS, and the Simocrane system has been supplemented with further technology modules. The systems prevent the cranes from swaying, position the containers in semiautomatic mode, and perform remote monitoring.

**Energy-saving and efficient**

The customer required the modernization to result in safer and more efficient cargo handling with lower energy consumption. In order to achieve this, the project team tailored many of the parameters of the automation and drive technology as well as the monitoring systems to the customer’s specific needs. Thus, motors and converters were configured in such a way that they can perform at full power when used together without overloading the individual components. By using regenerative Sinamics S120 converters, PSA Sines has also been able to reduce its carbon dioxide (CO₂) emis-
When we refer to Integrated Drive Systems, we are not only talking about the hardware, with perfect interaction among the drive components and their integration into the automation environment; we are also referring to the broad range of services offered for the entire product lifecycle of a plant. Services for Integrated Drive Systems offer perfectly matched services for all drivetrain components, while integrated services such as permanent condition monitoring, planned maintenance measures, and optimized spare parts management increase the plant availability.

Retrofit for Integrated Drive Systems offers another way to increase the availability and energy efficiency of machines and plants. Siemens provides comprehensive retrofit options with the perfect solution for every requirement. Thus, a retrofit that involves duplicating the original motor 1:1 is a good option when drivetrains have been in service for a very long time. In many cases, it is possible to replace the component with a standard product from Siemens’ extensive product range. From a technical point of view, upgrading to the latest technology is the ideal solution because migrating to variable modern speed drives, AC motors, and gearless drives sustainably lowers operating costs.

The managers of an Israeli potash conveying plant chose to retrofit the drive system. The plan was to retrofit both brushless synchronous motors with frequency converters. The project team chose Sinamics S120 because these converters could be easily adapted to the motors that were already in use. Another advantage: the new converters could be installed, and to some extent tested, during operation. This minimized costly plant standstills and the time-consuming transport of potash by road. Thus, the customer was highly satisfied with the result, not only from the technical but also from the logistical point of view.

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