Siwertell has designed a complete modernisation concept for a total replacement of an electrical system for a ship unloader. On the back cover you will find a case story of a replacement and modernisation of an electrical system for a customer in the United States.
Contact

Siwertell works closely together with representatives on all continents. Please contact our head office below and we will direct you to your local Siwertell contact.

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The Siwertell product portfolio includes ship unloaders, mobile ship unloaders, ship loaders, horizontal and vertical screw conveyors as well as complete dry bulk terminal solutions. Virtually any dry bulk cargo can be handled and all Siwertell solutions are designed to ensure sustainable, efficient and safe cargo operations. Siwertell is part of Cargotec Corporation.

Benefits

With a new electrical system it is easier to source spare parts which will result in shorter delivery times and better prices. A modernisation of the electrical system, also opens up the possibility of using a range of modern performance-enhancing software such as:

- reduced time for trouble-shooting
- display of key parameters
- analysing tools for problem solving
- maintenance instructions and log
- book on screen including drawings, alarm and performance data base
- anti-collision systems

You can also control critical forces applied to the Siwertell structure, optimise the capacity and manoeuvring of the unloader, improve the control and capacity of the inlet device and allow for extended working range in certain situations. By installing a new automatic system that matches the slewing and travelling speeds against the set capacity, the overall operation is optimised.

Scope of supply

The electrical system concept consists of:

- electrical design
- programming and factory design
- mechanical design for installation of the container on the unloader.
- PLC-system with UPS
- PLC software according to IEC-1131.
- PC-based HMI (SIMON-system)
- vertical arm tension meter system
- CAD-drawings for electrical systems frequency converters
- DTC-Regulated motions for travelling and slewing
- new cables from new container to junction boxes
- communication to shore via wireless LAN
- new external switches/sensors
- new external lighting units
- all technical documentation in electronic format inside the SIMON-system
- UL-approved switchgear
Case study - Replacement and modernisation of an electrical system.

SIWERTELL Shipunloader built and delivered 1981. The picture shows the unloader before the rebuilding of the electrical system was started.

The new electrical container is installed alongside the main beam. Ladders and gangways have been partly rebuilt and adapted for the container installation. The container construction itself is self-supported and covered with metal plating on the outside. The length of container is 9m (20`). The inner area of the container is separated in two zones, power circuit area and control system area. The inside container area is temperature regulated via air-condition (split-unit).

The switchgear is built in an UL-approved performance, with integrated frequency converters for speed controls of vertical conveyor, inlet feeder and motion control for slewing, luffing and travelling. All motions are DTC-controlled (torque regulation). If the mechanical forces are excessive during motion, the DTC-system will adapt the speed to preserve the machine structure. All frequency converters and the switchgear are linked to the PLC-system via fieldbus (Device-net).

In the electrical rebuilding concept a remote control system for wireless control is included. It communicates with the PLC-system via a fieldbus system (Device-net). In the front panel of the transmitter box an integrated LED-display shows alarm status and other running data like weight capacities, current values etc.

The PLC-system is decentralised with field mounted I/O-units, connected together with Device-net, fieldbus system. The use of a digital fieldbus system, makes it possible to remove a lot of the old installed signal cables. The PC-based SIMON-system’s graphics for advanced diagnosis allow and alarm detection, providing a detailed overview of all system parameters. A second PC-work station is installed on shore and communicates with the unloader via wireless LAN. All manuals, CAD-drawings, electrical drawings and handbooks are stored and available in the SIMON- system.

The PLC- and PC compartments are installed in a special compartment inside the container. Having a physical separation of the control system from the electrical power circuits, means operators in the container use to expose for electro-magnetic field is reduced. Also all the control systems are better protected when installed away from the power circuits.