

TANK MANAGEMENT WITH SAFETY

Reducing complexity on board and increasing efficiency

Market conditions are forcing shipping companies and ship owners to achieve greater efficiency with a reduced crew on board. A safe and reliable controller and monitoring system are therefore essential. Wilhelm Sander Fertigung (WSF) has developed SANSYS and the associated SANVISU operator interface, a new integrated valve control and tank management system for ships that was type tested and certified by GL. In the event of a disconnection or a failure of the main components, SANSYS provides universal redundancy and network redundancy. The system is made up of solutions from the portfolio of Bachmann electronic.

WSFSANDER AUTOMATION SYSTEMS

The trading company was founded in 1926 and Wilhelm Sander has had its own production since 1984. The Bremen-based company initially concentrated on valves and drives and is now a system supplier of remote control systems for ship valves for the shipbuilding and offshore sector.

The system is what WSF GmbH calls its 'Task Carrier': It gives the user complete control of the entire tank management of the ship or installation. SANSYS supplies reliable information about tanks – whether they are filled or discharged – as well about valves and pumps – whether they are working precisely. It also supplies the crew or the owner with information about the tank contents, temperatures and pressures.

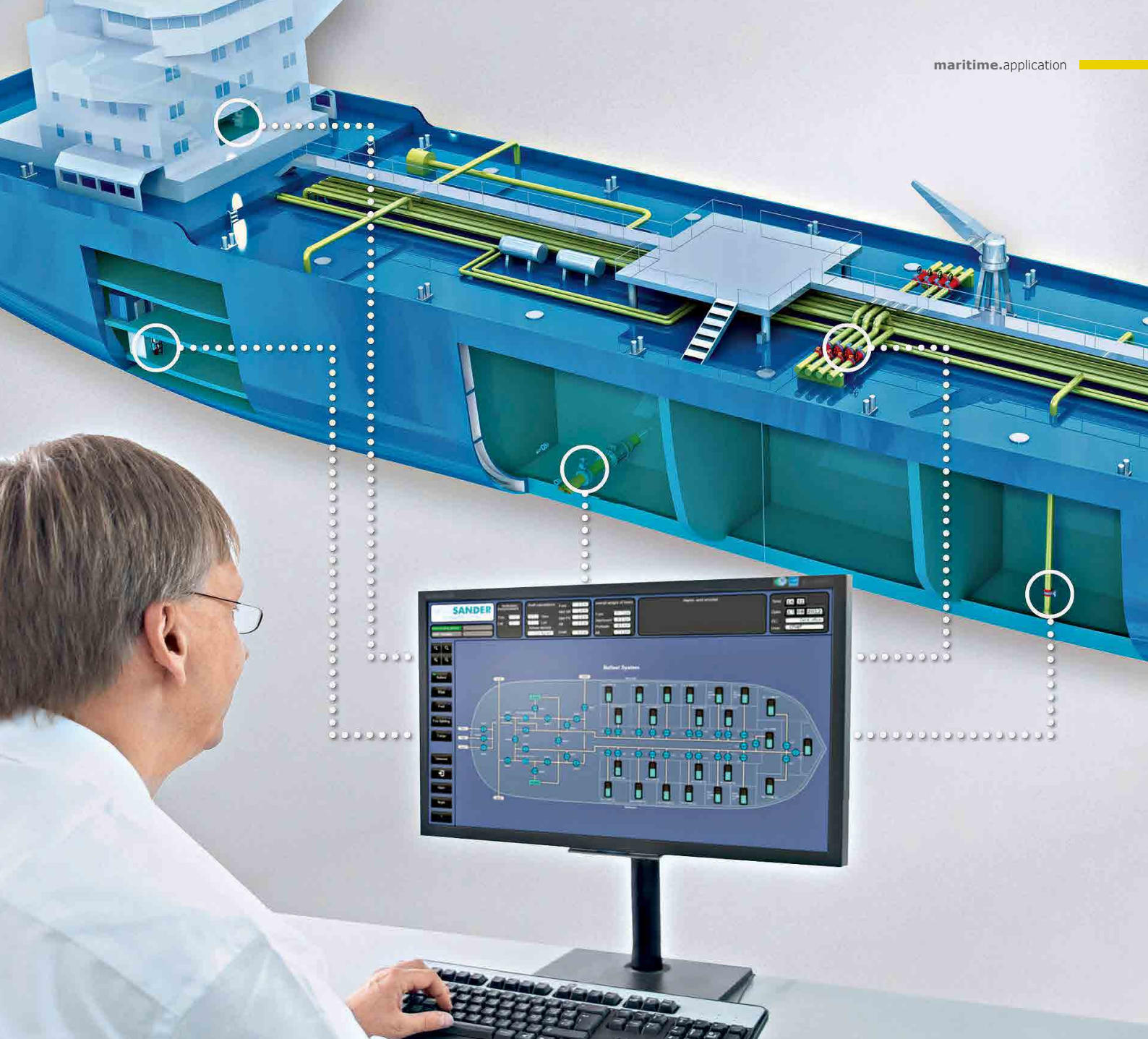
Single or redundant controller configuration

The company, which is based in Bremen, Germany, uses the powerful MPC240 and MC200 controllers from Bachmann for the implementation. This can be designed either as a single or a redundant system. The use of a redundant control system for the WSF application can be designed for both network and CPU hot standby redundancy. The implementation is also straightforward since the hardware components and the application software are identical for a single and redundant system. With

CPU hot standby redundancy, both masters run synchronously. Bumpless switching is executed and updates can be carried out whilst the system is running. The software hot standby redundancy consists of an automatic system comparison as well as a time synchronization and automatic failover. Network redundancy provides protection from failures in the communication structure with a switchover time that is shorter than a PLC cycle. It features an integrated diagnostic function for the status and quality of the network connection and can be used for both cyclical and acyclical communication.

Maximum safety for customers

The controller is used together with the robust input and output system (IO system) consisting of densely packed I/O modules that are a match for the harshest environmental conditions in the offshore sector. "Bachmann supplies a redundant system with standard components that offer our customers maximum safety," says Klaus Milde, technical manager



at Wilhelm Sander Fertigung. The on board power supply is also redundant in order to prevent failures and can be switched to manual or automatic. All devices are also protected from overvoltage.

Further options for more functionality

SANSY can communicate with other systems such as a loading PC or an alarm and monitoring system (AMS) using the interfaces provided and those established in shipbuilding. Remote maintenance is carried out using secure Internet connections or with a local update of the application using a memory card (PC, CF) or standard USB stick. Several applications can be run in parallel and autonomously using the

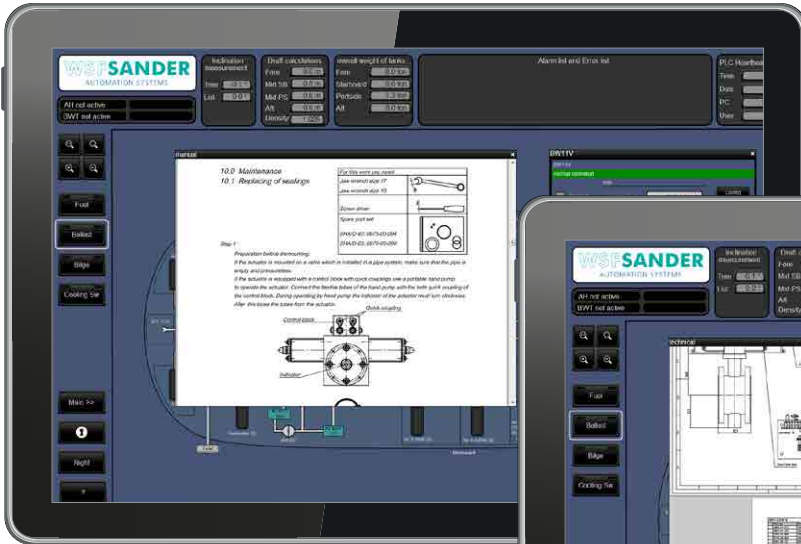
Bachmann controller. Water ingress detection and/or condition monitoring can be added as an option to standard applications such as valve control, anti-heeling, tank content measuring, pump control, simulation, deck lighting and fan cooling if required.

Condition monitoring, for example, can be used to give early warning of wear on actuating elements such as valves (flaps) and pumps. "Thanks to the extensions possible, we are well equipped for the future and can expand our portfolio without having to change the existing application," says Klaus Milde.

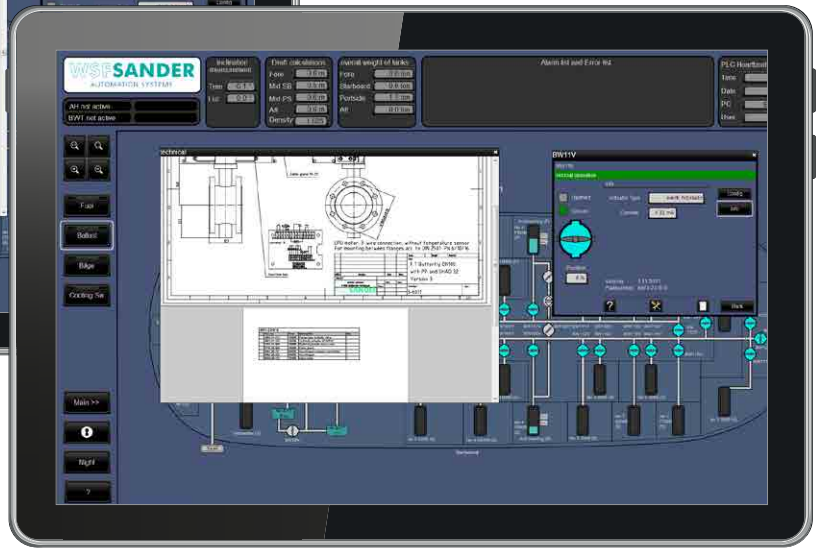
Simple handling thanks to the Project Manager

The PLC programs required are created by

▲ The SANSYS can also be controlled and the on board settings accessed from a remote workstation far away from the ship.



▲ The dialog window manual valve system dialog shows the operating instructions for the selected valve, when clicking on the tool icon. This shows the maintenance personnel how to change the modules.



▼ The dialog window parts list system dialog displays the drawing of the selected device and the spare parts list, and enables the crew to order the correct spare part quickly and in a targeted way.

project designers and service technicians using the Project Manager of Bachmann's Maritime & Offshore Essentials (MOE). "The Project Manager enables us to automatically generate our PLC software error-free in a short space of time," Klaus Milde, technical manager at WSF, highlights and adds: "Objects such as valves, pumps and tanks can thus be created in a library and automatically linked with the PLC variables." Frequently used valve movements with activation sequences, delay times and the activation of the required pumps can be defined so that the ship's crew can call them up and start them. This application offers greater

convenience and safety. "Thanks to the Valve Editor we can meet customer requirements right up to shortly before shipment," says Klaus Milde and adds: "All project-related data can be parameterized. No reprogramming is required for individual fine tuning." An OT200 operator terminal is installed in the control cabinet door in the machine room to allow local operation. All Bachmann products come with the necessary shipping approvals such as Germanischer Lloyd (GL), Lloyd's Register of Shipping (LR), Det Norske Veritas (DNV), American Bureau of Shipping (ABS) and Bureau Veritas (BV), as well as the SANSYS and SANVISU systems.

Visualization – location-independent and scalable

The associated SANVISU visualization system provides the operator interface for controlling and managing all SANSYS functions. Here also, the Bremen based company relies on a product from Bachmann and uses the atvise SCADA system. "The innovative and scalable visualization system and a browser, or if required Apple and Android apps, enable me to have my alarms, tank content data and more instantly in view," Klaus Milde says. From the bridge or from the ship's office, I can access the web application with a standard browser from any location and from any device. The installation of any additional software is unnecessary. Thanks to the vector graphics (SVG) used, the application is scalable without any loss and can

»Several applications can be run in parallel on the Bachmann controller. We are thus well equipped for the future and can add condition monitoring, deck lighting and water ingress detection to our portfolio without having to change the existing application.«

Klaus Milde,
Technical manager,
Wilhelm Sander Fertigung GmbH

be adapted to any screen size – regardless of whether this is for a laptop, a tablet or a smart-phone. The zooming of the details of all ship areas can be carried out without any problem. The SANSYS dialog windows provide operators and maintenance personnel with a particularly convenient multi-lingual feature. The SanSys manual system dialog explains the user interface, enabling new crew members to familiarize themselves with the system. Clicking the icon in the manual valve system dialog shows the operating instructions for the selected valve. This shows the maintenance personnel how to change the modules. Clicking the information icon displays the drawing of the selected device and the spare parts list (parts list system dialog). The crew can order the correct spare part quickly and in a targeted way. The relevant documentation is always provided at the correct point, thus preventing panic and misunderstanding on board in the event of a fault.

Convenient tank content measurement

Tank measuring with SANSYS is carried out as follows: Geometric data for the tanks as well as other ship-related parameters from the tank list of the shipyard, the so-called sounding list, are read in by the Bachmann controller in the form of a CSV file. The auto configuration of the individual tanks through the read operation is a key element in the standardization of the application program. Changes to the PLC source code thus become unnecessary since any adaption is carried out by inputs via the operator interface of the visualization. The reading in of a file containing the tank data saves any labor-intensive and error-prone editing of tank lists during commissioning in the shipyard. Data from the fuel system can for example be transferred to the ship owner's cell phone. The systems from WSF also come with a type approval from the well-known shipping classification societies such as GL, DNV and LR. Wilhelm Sander Fertigung offers its customers a service for remotely monitoring systems by its qualified personnel in order to suggest targeted measures in response to changes. For this the system status is transferred to the Bremerhaven company for analysis. In recent years, the company has produced a number of innovations and further developments. From the former trading company, WSF, with its engineering, service and consulting portfolio, has grown to become a system supplier for ship building and the offshore industry.

▼ Integrated tank management

