Application

Monitoring and Control of Bilge Water Dumping

GPS data recording in the shipbuilding industry

Bilge water treatment – why is this process so important?

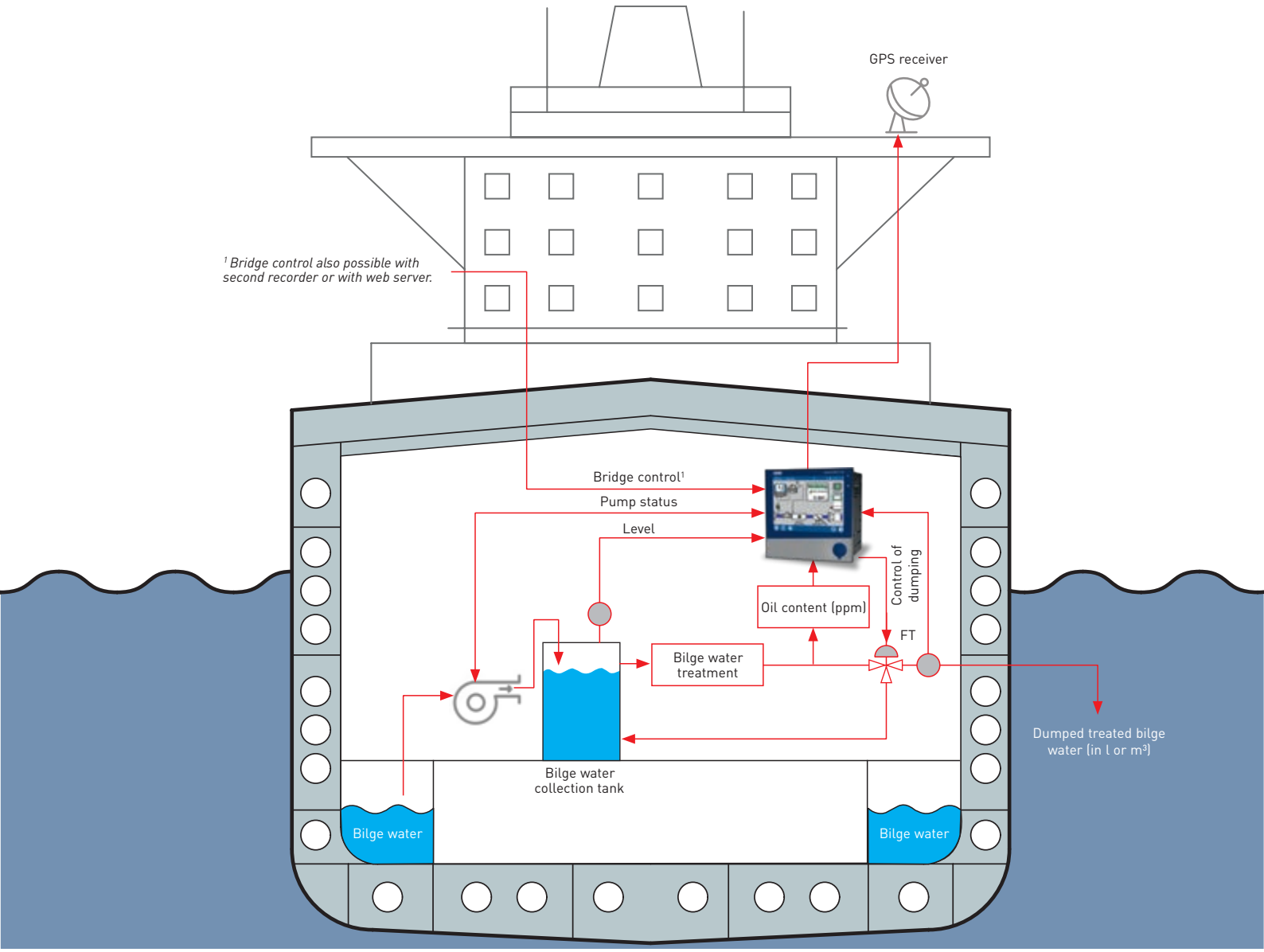
No other waste product on a ship is as closely associated with heavy fines and imprisonment as bilge water. Bilge water is wastewater that is generated in the engine room or in the so-called bilge shafts that is often contaminated by oil and other substances. It forms for a variety of reasons including tank overflows, cleaning and maintenance operations, drains, and leaks. Overflowing of the bilge shafts can pose a danger to the engine room and lead to accidents as well as emergency situations. To avoid these risks, the bilge water is pumped out of the bilge shafts at regular intervals.

The International Convention for the Prevention of Pollution from Ships (MARPOL) states that bilge water must not be directly disposed of into the ocean. The exception here is when doing so saves lives while at sea. Bilge water has to therefore first be treated to reduce the oil suspensions to below 15 ppm. This process needs to be documented in a verifiable manner. The ship owner is required to ensure that the limit values have been observed. Furthermore, the position of the ship and the quantity that has been dumped overboard must be recorded. The JUMO LOGOSCREEN 700 paperless recorder is exactly the right product for this high standard of reliable process data recording.

Monitoring and control of bilge water treatment

The process:

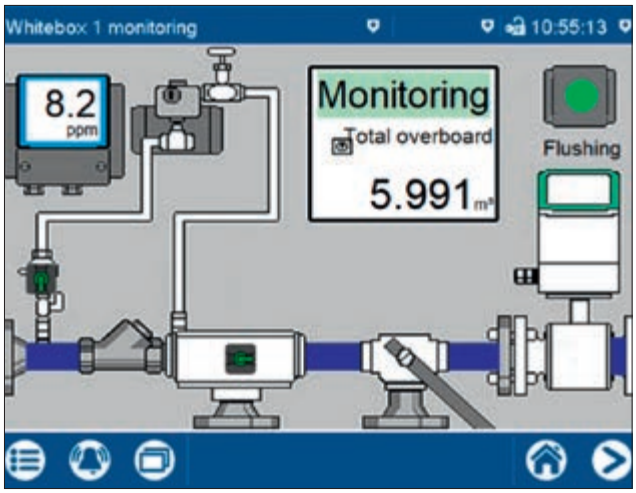
The wastewater collected in the bilge shafts is pumped into bilge water collection tanks. There, it is treated using a special purification system to reduce the oil content to below 15 ppm. The so-called OMS (Oil Measurement System) continuously measures the oil content in the bilge water and transmits the measured values to the JUMO LOGOSCREEN 700. It fully automatically controls the dumping of the treated bilge water by opening the three-way valve for overboard disposal in a manner that corresponds to the system status. Of course, in addition to the control tasks, the JUMO LOGOSCREEN 700 also handles the complete recording of process-related GPS data, events, and alarms as well as the recording of the oil content and the dumped quantity of purified bilge water in m³ and liters. In addition to visualization on the device itself, process data visualization via web server is a possible option. The web server can be customized to meet individual customer needs upon request.

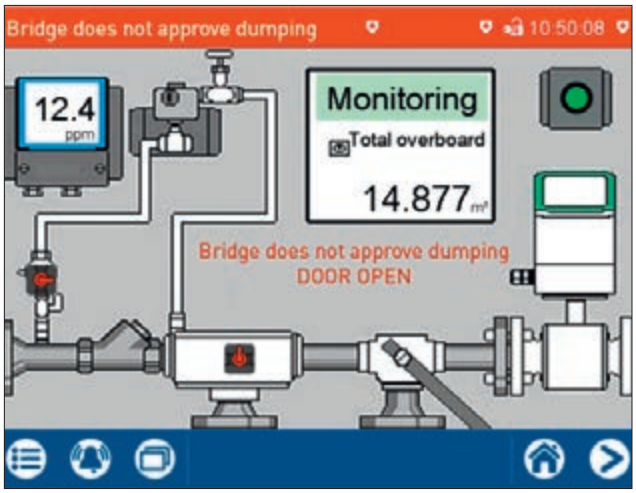


Process sequence of bilge water treatment

Process monitoring at a glance

In addition to curve diagrams, bar graphs, and text images, 10 customizable process screens are also available. System monitoring made simple is the motto here. You can see all process-related data at a glance, examples of which include the oil content of the bilge water in ppm and the quantity of bilge water dumped overboard in the respective unit required (l or m^3). You can also see all states of the process-related sensors and the position of the controlled three-way valve. Basically, dumping overboard is differentiated between active, permitted dumping and prohibited dumping.





Permitted overboard dumping:
You can quickly recognize that active dumping is pending by the blue-colored lines and the three-way valve being switched in the direction of flow. The ppm content as well as the amount already dumped can also be determined immediately. The alarm bar is not active. The system is in the go-state.

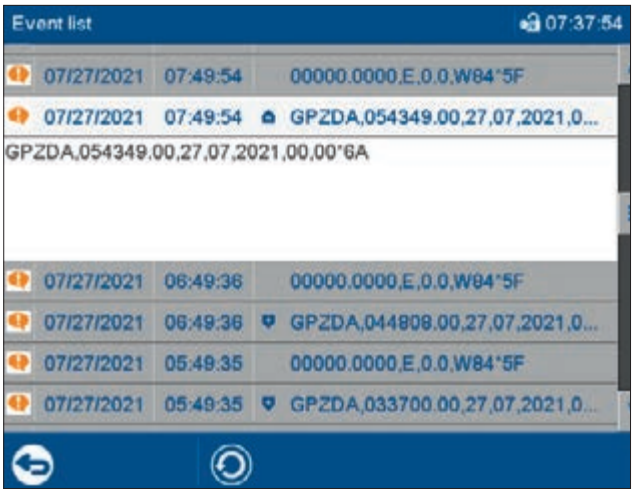
Prohibited overboard dumping:
The system state "dumping prohibited" can be displayed via the red colored alarm bar. The alarm bar displays the pending alarm message. It signals to the operator which alarm in the system has triggered a stop for dumping. Compared to the left process screen, the line is no longer colored blue. The three-way valve, which controls the dumping, is automatically in the locked position when an alarm is pending.

As you can see by comparing the 2 images, the user can easily get the current system information from the process screen. Here, a process screen that can be individually adapted to customer requirements offers a high degree of flexibility for every customer solution.

Recording of GPS data

An extra feature of the JUMO LOGOSCREEN 700

The serial interface of the JUMO LOGOSCREEN 700 can be used to receive and record GPS data from GPS receivers in NMEA 0183 data format. GPS data is automatically stored in the event list of the device at an adjustable time interval (60 sec. to 60 min.). In addition to the position, 2 other GPS data sets can be recorded. Depending on the GPS receiver, the time, the speed of the ship, or even the course can be logged. Furthermore, the stored data can be forwarded to higher-level controllers via Modbus or PROFINET.

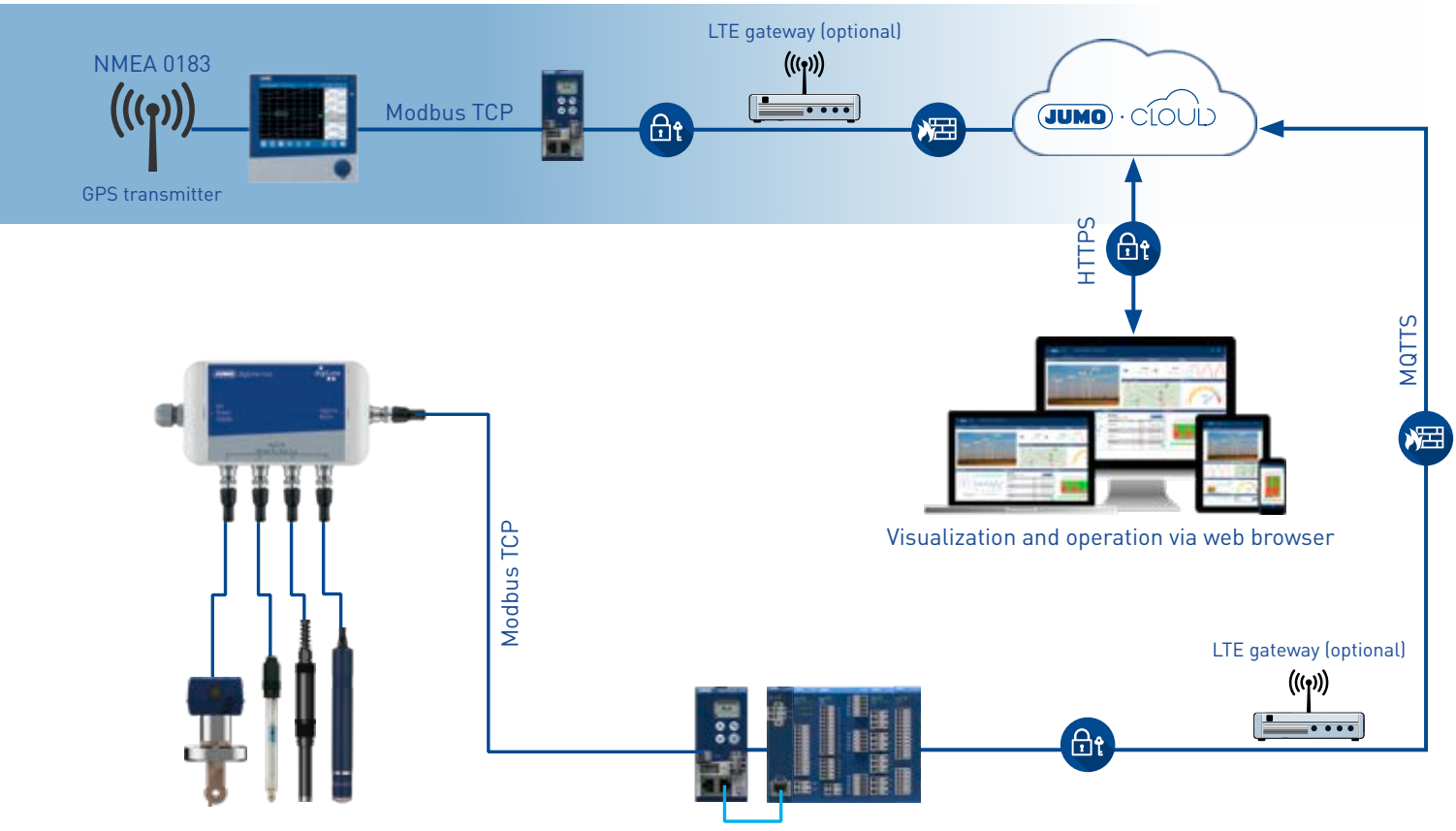


Automatically archive and export data

The optional PC communication software (PCC) and the optional PC evaluation software (PCA3000) from JUMO can be used to fully automatically extract and archive the measurement data recorded by the JUMO LOGOSCREEN 700. The software package also offers you the option of exporting the extracted data fully automatically to a file format of your choice (e.g. PDF or Excel) or to print it out.

JUMO Cloud – IoT for secure process visualization

The IoT platform for process visualization as well as for data acquisition, evaluation, and archiving enables worldwide access to measurement data using common web browsers. Among the distinguishing features of the JUMO Cloud are its high degree of security as well as its valuable visualization, alarm, and planning functions. Leave the data storage to JUMO – including backups. Here you can rely on the highest safety standards. This way, you reduce the effort involved in data management so that you can fully concentrate on your processes. In addition, extensive trend and reporting features help you create reports and optimize your plants.

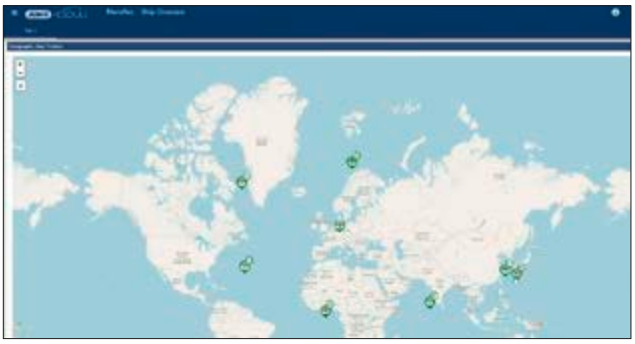


Using JUMO variTRON 300, the important process data that is recorded in the JUMO LOGOSCREEN 700 for bilge water treatment and dumping can be securely transferred to the Cloud, where it is stored (see part with blue background). In addition, other sensors as well as digital input and output modules can, of course, be connected to the JUMO variTRON 300.

From the sensor in the JUMO Cloud

All ships at a glance

The JUMO variTRON automation system converts the stored GPS coordinates from the JUMO LOGOSCREEN into dynamic longitude and latitude coordinates. These are then used to determine the location in the JUMO Cloud. A selectable icon shows the live location on the map. The cloud allows you to see all the ships that pertain to you on this map. This ability is a great advantage. Hovering over the individual ships also allows you to view important process data such as the amount dumped overboard or the oil content of the bilge water. By clicking on a ship, you jump directly to the associated, personalized dashboard of that vessel.

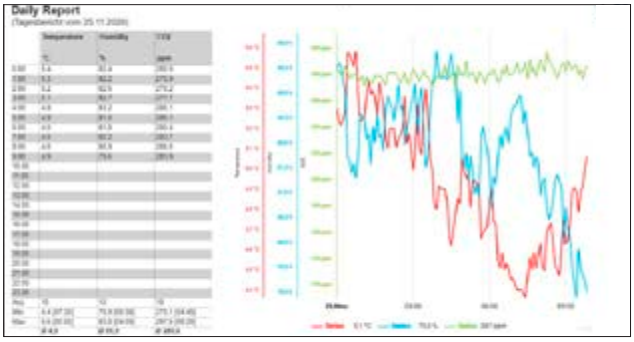


Dashboard of a ship

In the personalized dashboard of your ship you are free to design the widgets. In addition to a process screen visualization as well as alarm and system information, it is also possible to evaluate the stored measurement data such as the oil content of the bilge water over the last days and months. The dashboard allows you to conveniently compare the dumped quantity of the previous days with the current daily quantity. As a result you quickly get an overview of your complete process.

Reports for critical data

The critical process data that requires verification can be presented in clear daily, weekly, monthly, or annual reports. If required, these reports can be easily printed out.



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