SULZER

CASE STUDY

Rental pumps in action at the Kaiserschleuse lock in Bremerhaven

The lock “Kaiserschleuse” connects the Weser river with the part of the international port in Bremerhaven that is independent of the tides. Much of the German automobile trade passes through this lock and two shipyards are located behind it. It was built in 1892-96 and was the largest lock worldwide, 223.2 m long and 28 m wide, at the time. Since then, the lock has been extended to 305 m and widened to 55 m. Each of the three floodgates weighs 2’200 tons (57 m long, 23 m high, 9 m wide). The extended Kaiserschleuse is now as wide as the new locks of the Panama Canal, and was completed in 2016.

“The whole operation was extremely challenging because of the weather conditions and the time pressure. The ground in front of the lock and in the lock basin was severely silted and we needed additional equipment to keep the sludge pumpable.”

Michael Sasse, Sulzer Project Leader, Isernhagen, Germany

The challenge

During an inspection of the installation in October 2014, massive damage was discovered on the undercarriage rails of the floodgates and their mountings. Strong deformation of the railheads over the complete length of the rails and some break-outs of concrete from the rail anchorage were stated. The repair costs were estimated to be 2-3 MEUR.

The entire working area is normally under water. Therefore, the contractor, Bremenports, needed a reliable pump supplier and service provider with extensive expertise in project planning and implementation, and one that had direct access to sufficient and appropriate pumping equipment.

The solution

To renew the rails, the outside bulkhead had to be drained. The lock chambers had to be locked and continuously emptied of sea and harbour water. To achieve this, the gates had to be removed and mobile gates brought into position by using ships. The mobile gates were to be pushed against the lock construction by the high tide and the water flow in the harbour. After this the sealed area was to be dewatered as fast as possible.

The construction work could be done only at a low water level and weak wind. The first attempt to bring the mobile gates into position with the help of ships was not successful. It was not possible to seal the chambers properly because the ground was severely silted. It had to be cleaned of vast quantities of sludge as fast as possible to reach the solid stands for the temporary gates. With additional pump technology (rental pumps) and overtime work, the temporary sealing of the Kaiserschleuse was achieved two low tides later.

Customer benefit

- Thorough planning and consultation on site
- Project planning by and in cooperation between Sulzer and the rental partner Duwe KG, Leipzig
- Complete offering, including rental pumps and services, by Sulzer through Duwe KG
- Complete dewatering incl. service and required equipment (pumps, pipes, such as 6x50 m flanged pipe DN 350 and DN 400 etc.)

Rental pumps in the lock chamber: parallel installation of six flange pipes

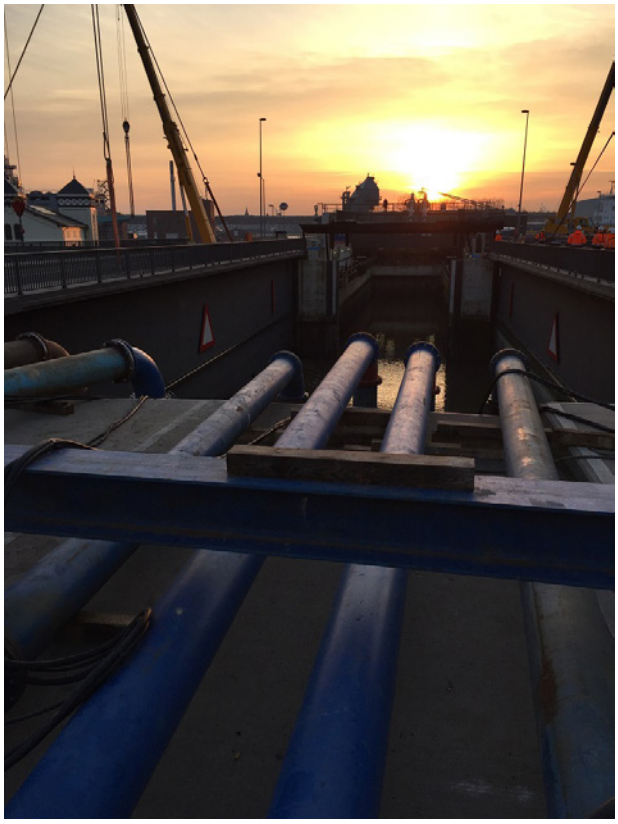
The Sulzer difference

- Rental pumps, expert advice, and flexible labor from Sulzer contributed substantially to the successful repair.
- In Germany alone, Sulzer has over 620 rental pumps for dirty water, sludge and municipal wastewater
- The rental pumps and related equipment are fully prepped before each use and are made available to customers at more than 30 locations in Germany.
- Comprehensive consultation, design, and service for the products complete the offerings.
- Sulzer cooperates with the fastest carriers and the most reliable and experienced complete service providers.

Scope of delivery

In addition to consulting, design, and project planning Sulzer delivered:

- Four rental drainage pumps J 604 ND for permanent water drainage (drainage of lock chamber).
- Two rental drainage pumps J 205 as supply pumps for sludge dilution.
- Calculated pump capacity ca. 2’000 l/s.



Emptied lock chamber at daybreak: mobile flange pipes DN 350 and DN 400

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