SULZER

CASE STUDY

Flood-proof irrigation pump station simplifies design, construction and maintenance

Located in the centre of Tasmania, Australia, the Milford project comprises a river water extraction pumping station that harvests water to a holding dam for off-season irrigation use. The project was completed in 2013.

"By providing a submersible option, we saved hundreds of thousands of dollars compared to the specified inclined turbine pumps – and we were able to offer the same level of pumping efficiency."

Elliot Booth, Senior Project Manager, Andrew Walter Constructions Pty Ltd.

The challenge

The river has a high one-hundred-year flood level, so the designers of the project originally specified inclined turbine pumps as the most appropriate and efficient pumps for the task. The design brief depicted several inclined turbines running nearly 30 meters down an embankment to the river with a large pump station and control building at the top - a large, complex piece of infrastructure.

The solution

Sulzer developed a plan to install four large submersible pumps, which saved on infrastructure and meant that the contractor only had to build a typical submersible pump station at the river's edge. It also meant that in times of flooding, the pumps would not be affected. The only building required was a small steel shed to house the controls above the flood level. By using Sulzer pumps the contractor was also able to provide a better hydraulic efficiency than even by the turbine pumps.

Customer benefit

Compared with inclined turbine pumps, submersible sewage pumps are simpler to install and maintain and have lower capital cost whilst maintaining similar, if not better efficiency. Apart from the capital cost of the pumps, there were significant savings in the surrounding earthworks and associated civil construction.

The impeller hydraulic design is a two-vane closed channel type. Channel impellers have high efficiency and are suited to systems where free solids passage is important, but the risk of soft blockage is low, like in this river water application.

Wear will be minimal pumping the clear water of Tasmania, but when this eventually occurs the pumps' wear rings can be replaced, restoring factory efficiency.

The Sulzer difference

- Applying tried-and-tested sewage pumping best-practice to fresh-water pumping applications create simple, robust and cost-effective solutions.
- Using submerible pumps, the installation is more compact, less unsightly and quieter than traditional inclined turbine pump solutions.
- Significant savings in capital costs as well as earthworks and civil construction.

Lowering the submersible sewage pump

Product data

The station is equipped with four Sulzer submersible sewage pumps type ABS XFP 301M-CH2 PE2500/4, for a total duty of 2’100 l/s @ 36 metres.

Milford pump station - XFP301M CH2 PE2500/4	
Flowrate	525 l/s
Head	36.5 m
Discharge diameter	300 mm
Motor power	250 kW
Hydraulic efficiency	81.60%

The pumps are fitted with cooling jackets, EMC cable, three water ingress probes and thermal monitoring for the bearings and stator.

The station is remote and personnel are rarely on site, so the pumps are fitted with sensors that through the switchboard telemetry remotely warn the owners of any potential problems before they unexpectedly shut down the station or cause damage to the pumps.

Closed-circuit glycol-filled cooling jackets are also fitted as the varying river level means the motors are not submerged all the time. Without the cooling jackets, the motors could overheat at low river levels when water is needed most.

The EMC shielded power cables prevent electromagnetic disturbances generated from the variable speed drives from interfering with other sensitive electronic equipment located nearby.

For any inquiries please contact

kevin.sparkes@sulzer.com

sulzer.com