

Case note

Innovation for South Australian water pumping station

Barossa Valley vineyards, almond, citrus and stone fruit orchards benefit

Paringa is a small town in the Riverland area of South Australia famous for its vineyards, almond, citrus and stone fruit orchards. The area lies north of the Barossa Valley region – one of Australia's most famous wine regions.

Water is a vital resource in the Riverland area where summers are dominated by hot dry days. Over the last five years, the region has been subject to strict water restrictions imposed by drought conditions. Water is pumped out of the nearby Murray River to irrigate the area. Actions to achieve water use efficiency are paramount in this region, while pumped water is subject to stringent restrictions imposed by local authorities.

ABB value provider GH Electrical based in Mildura have been working with local authorities to engineer a suitable solution for the Paringa pumping station, which provides water to this region. Additional pumps have been installed, major upgrades have been implemented including installation of dual pumps and improved control systems, contributing to overall improvement of pump station capacity.

The most energy efficient and cost effective solution was to install a special application on two pumps.

Rather than using a traditional solution of two frequency drives for the two pumps, just one frequency drive was designed together with a synchronous by-pass. The synchronous bypass uses one frequency drive to control one pump up to speed - putting that pump directly on line – allowing the frequency converter to control the second pump.



Overall, the application drives a sizeable 300 kW pump motor. An ABB single drive and two pump motors regulate the flow pressure. The synchronizing unit is coupled together using ABB smart electronics, low voltage components and a PLC unit which takes care of the special starting phase.

The ABB variable frequency drive ramps all the motors up to speed at a controlled rate, minimizing the inrush current required by each motor at startup.

The variable frequency drive ensures that the two units are operated at the desired speed, thus avoiding over compensation from the network or more than one unit carrying more than its design load level - which would adversely affect harmonic levels on the local network.

Since this pumping station is close to a residential area, there was also need to reduce noise and electrical energy interference issues that had occurred over the years when the huge pumps were started. To reduce electrical noise, the team at GH Electrical applied ABB harmonic filtering. This solution also adheres to stringent requirements from the local power supply authority with regard to starting currents, harmonic levels and possible voltage drops on the network.

GH Electrical have plenty of experience with pumping stations and irrigation systems. Their specialist knowledge and expertise has provided an ABB solution that is not only acceptable to local authorities but also to the many residents who rely on energy and water in this rural environment. An environment close to the Barossa Valley famous for it a major wine producing area and tourism destination.

Fact file

- 1 x ABB drive ACS800-01-205 160 kw 254 Amp
- 1 x ABB RSYC-0 synchronising module
- 2 x 150kw 4pole motors driving 2 x Kelly & Lewis pumps into common manifold with 20m rising main plus 5.6 km pipeline at approximately 600 kpa
- 1 x ABB PLC AC500-eCo
- 1 x passive harmonic filter



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