Lifting capacity without the cost at the Wollongong Sewerage Treatment Plant

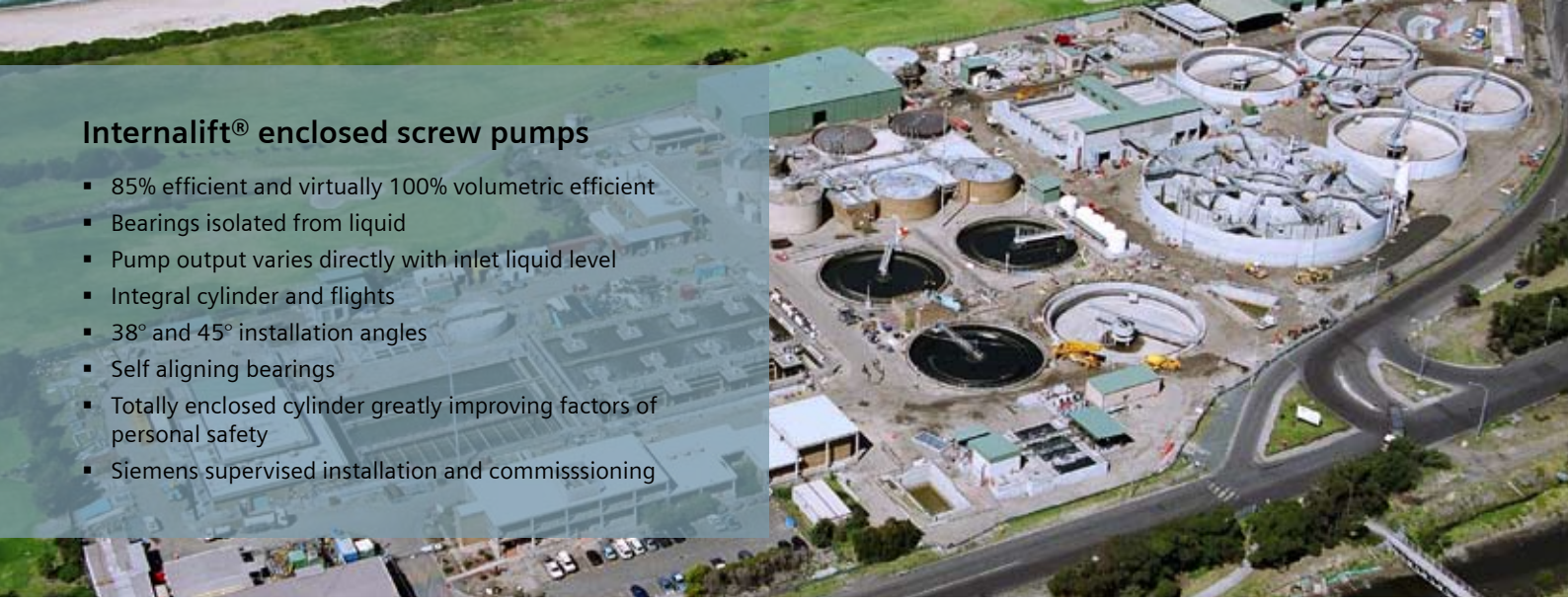
Sydney Water provides essential water services for the Sydney, Illawarra and Blue Mountains regions, focusing on recycling and desalination as well as community education on water efficiency. As Australia's largest water utility, Sydney Water provides drinking water, recycled water, wastewater services and some stormwater services to more than four million people. Sydney Water's Wollongong Sewage Treatment Plant is part of the larger Illawarra Wastewater Strategy which is expected to save up to 7.3 billion litres of fresh water each year. The Wollongong plant will contribute to this strategy by producing up to 20 million litres of recycled water each day for BlueScope Steel and is currently using Siemens Memcor® microfiltration and reverse osmosis.

The challenge

The Wollongong Sewage Treatment Plant currently receives an average of 40 million litres per day of incoming flow in the current dry climate. Wastewater collected from the Wollongong, Bellambi and Port Kembla catchments is pumped to the plant each day for tertiary treatment and recycling. In very wet weather, the Bellambi and Port Kembla treatment plants store wastewater which is then pumped back to the Wollongong plant when flows subside.

In 1985, two Internalift® enclosed screw pumps, otherwise known as RAS pumps, were installed at the Wollongong plant. These pumps are used as return activated sludge lift pumps, transporting activated sludge from secondary clarifiers to the aeration tanks. After 23 years of reliable, virtually maintenance free service, one of the screw pumps finally required upgrading, especially with increased inflowing capacities forecasted for the future.

Sydney Water and the Wollongong Sewage Treatment Plant operators are very pleased with the performance, reliability and energy savings of the Internalift® screw pumps. The sustained high efficiency and cost economies experienced from these pumps prompted Sydney Water to upgrade the Internalift® enclosed pump, rather than to source another supplier.



Internalift® enclosed screw pumps

- 85% efficient and virtually 100% volumetric efficient
- Bearings isolated from liquid
- Pump output varies directly with inlet liquid level
- Integral cylinder and flights
- 38° and 45° installation angles
- Self aligning bearings
- Totally enclosed cylinder greatly improving factors of personal safety
- Siemens supervised installation and commisssioning

The solution

Siemens provided an advanced Internalift® screw pump for Sydney Water to replace the existing pump. Siemens Internalift® enclosed screw pumps provide efficient and reliable means of lifting large flows of liquid and liquid-solid mixtures with pump efficiencies as high as 85 percent and volumetric efficiencies approaching 100 percent. Pumps can be installed at incline angles up to 45 degrees and can be used for vertical lift heights to 18 metres. Flow rates of up to 5224 cubic metres per hour (m^3/hr) can be achieved.

The replacement pump was re-engineered for added capacity without jeopardising its service life. One significant enhancement was the incorporation of a high efficiency Siemens motor and gearbox assembly ensuring minimum energy consumption and maximum gear train power. To maintain efficient operation, an adjustable, automatic oil lubrication system was provided. The oil system introduces oil at the wear ring to roller interface and monitors the oil flow.

Adding to this, a Siemens specialist was flown to the site to complete the start-up and commissioning of the pump. This enabled the installation and commissioning process to be completed in just five days with minimal disruption to the plant's operations. The swift installation process also included a comprehensive testing stage, which then enabled the pumps to be back in full operation.

The outcome

With the renewed and upgraded pump installed, Sydney Water can now continue to enjoy minimal power costs and simplified maintenance. Downtime is also minimised as shutdowns are not required for lubrication and jamming as well as sun arching. Furthermore, shelter requirement is eliminated.

Sydney Water can now expect this new pump to endure another 20 to 30 years, as did the previous model. With such an efficient and long lasting product, Sydney Water is now considering upgrading the secondary pump to this same model in the near future.

The Wollongong Sewage Treatment Plant will continue to produce water for surrounding industries, easing pressure off the region's drinking water reserves. Sydney Water is now planning for stage three of the Wollongong Recycled Water Scheme, which would provide even more recycled water for industrial customers in the area.

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