



ABB service in water

Provision of eBOP service to world's largest covered wastewater treatment plant

JOSEPH QUEK – The award-winning Changi water reclamation plant (CWRP) in Singapore is the world's largest covered wastewater treatment plant. This exceptional construction is equipped with a wide range of ABB products. ABB have now been awarded a complete service package at Changi and thus will continue to contribute engineering know-how to what is regarded as one of the world's most innovative and visionary water projects.



The Changi water reclamation plant → 1 is one of the largest water reclamation facilities in the world. The CWRP and Deep Tunnel Sewerage System (DTSS) in Singapore will collect, treat and purify every drop of waste water produced by the city-state over the next 100 years, replacing all existing local plants in Singapore. Located at the eastern edge of Singapore, the plant is mainly underground and is built in a stacked arrangement, thus occupying a land area less than one third of a conventional layout. The plant produces clean water to the highest international standards, suitable for deep sea discharge in the Straits of Singapore. On the rooftop, CWRP incorporates the fifth operational facility (NEWater) in Singapore capable of reclaiming potable water which is fit for human consumption or for high-requirement industrial use.

The project was crowned the Water Project of the Year at the prestigious Global Water Awards 2009 in Switzerland.

Title picture

The Changi Water Reclamation Plant is fed by a mammoth 48-km tunnel sewer running up to 55 metres below ground. The picture shows just some of the pipework which handles the huge inflow.

Powering Singapore's water superhighway

Amounting to a project cost of US\$3 billion, the CWRP uses the most advanced technology available to treat two-thirds of the 1.3 million cubic meters of wastewater Singapore generates daily. The plant is being extended to a daily maximum capacity of 2,400,000 cubic meters – sufficient to accommodate the entire needs of Singapore.

Building the CWRP threw up many technological challenges and ABB played a prominent role in its construction by providing advanced power and automation expertise and products such as high-efficiency motors and medium-voltage drives that enable critical parts of the process to operate at the highest levels of energy efficiency and reliability. In fact, throughout the entire Changi water treatment process ABB products and systems power, monitor, measure and speed-control crucial process equipment in the liquid and solids treatment modules, sludge drying systems, centrifuges and turbine generators, and effluent pumping station.

Water service to CWRP

ABB is no stranger to the global water industry, having supplied electrical, automation and service solutions for more than five decades. It has one of the largest installed bases in this industry, as well as market and technology leadership in power and automation technologies, unrivalled application know-how

The three-year, \$2 million service contract is for the electrical Balance of Plant (eBop) which will help ensure reliable and efficient operations of CWRP.

2 The service package covers such items as motors and drives, distribution boards, transformers, switchgear, and so on



and process expertise in all application areas of the water cycle. These include water transfer systems, distribution and irrigation networks, pumping stations, desalination plants, as well as urban and industrial wastewater treatment and re-use plants.

A key driver for ABB is to deliver energy efficient and lifecycle cost-optimized solutions. And the company's worldwide service capability and lifecycle manage-

ment expertise enables plants to keep running optimally throughout their entire operational life.

With its wide range of products, systems and services, ABB follows the whole lifecycle of Changi Water Reclamation Plant, from engineering to construction to, now, service and maintenance. ABB supports CWRP in identifying the best solutions for their specific needs, including maintenance and asset optimization.

The service contract from the Public Utilities Board, valued at just under US\$2 million, is a three-year service and main-

tenance agreement for the electrical Balance of Plant (eBop) which will help ensure reliable and efficient operations of CWRP. The service package includes the vital maintenance of critical

equipment such as 21 units of medium-voltage, high-efficiency motors and water-cooled, medium-voltage drives that power and control the huge pumps at exceptional levels of energy efficiency. Also covered are high-voltage distribution boards and transformers; medium-voltage switchgear, motors and drives; both low- and medium-voltage transformers; and low-voltage switchboards, switchgear, motors and drives → 2.

Under the service contract, ABB provides, 24/7, certified standby engineers and response to site within four hours for critical equipment. A key engineer is

assigned to support the CWRP and internally coordinate various service groups to establish a single contact point. Through this contact, ABB helps CWRP to plan and execute regular maintenance.

Other value-added aspects of this full service contract include providing Parts Online Access, maintaining the failure log book and supplying basic training and refreshers for ABB equipment operation. With ABB's Logistic Center Asia (LCA) located in Singapore, local, fast response on spare parts is available, thus allowing CWRP to minimize their spare parts inventory. Last but not least, and viewed by the customer as very important, are the local drive service workshops and Motor service workshops led by ABB factory certified personnel.

Key success factors in service

Despite the wide range of ABB equipment involved in the service contract, the customer perceives just one ABB entity. This exceptionally easy interface makes it simple for CWRP to run and maintain their equipment. The CWRP maintenance team has peace of mind as ABB personnel will always be there to support and resolve any of their issues in all the critical equipment. For full clarity, the customer has easy access to ABB's sales and service engineers via a clear and simple contact chart.

Changi Water Reclamation Plant has recognized how ABB's service can help increase the reliability and efficiency of their operations:

"We thank ABB for the service provided so far, and also for assigning proficient and efficient engineers to support CWRP. ABB engineers have been very responsive, accommodating and helpful to our maintenance team. For that, we are very grateful and appreciate their efforts and diligence in keeping our critical equipment in good working order," complimented Mr. Lim Swee Sen of Public Utilities Board.

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After the Changi Water Reclamation Plant went into full operation in June 2009, ABB were following up with the customer when it was noticed that he had a demand for a complete service package. The customer had contact with various ABB departments regarding service requirements so ABB co-ordinated a response across several of its divisions and created a single comprehensive service contract offering.