Sydney Airport Recycled Water Treatment Plant, Australia

Application: Combination of MBR and RO for wastewater recycling

Capacity: 0.75MLD

Location: Sydney, Australia

Commissioning: 2008

Challenge

The region of Sydney, Australia has experienced water supply issues that have led to a rise in costs for potable water supplies. This coupled with environmental concerns, has led to the region’s government to implement water quality regulations and drive reuse initiatives.

In order to meet continued pressures being placed on commercial and government organisations to conserve fresh water supplies, Sydney International Airport, Terminal 1 (T1), created an environmental planning strategy to design and construct a water treatment plant in order to recycle its wastewater and reduce its dependency on fresh water.

Solution

Housed within an architecturally designed commercial facility at Sydney International Airport, the Recycled Water Treatment Plant is designed to recycle the airport’s wastewater for non-potable use including toilet flushing within the terminal and cooling towers around the terminal.

As part of its new wastewater treatment plant design, Sydney Airport Corporation selected a GE solution that combined a Membrane Bioreactor (MBR) system and Reverse Osmosis (RO) system.

The MBR system is used to treat (recycle and re-use) domestic/airport sewerage and allow that treated water to be used in the flushing of the airport’s toilet system.

At the core of the MBR system is GE’s ZeeWeed 500 membrane; an advanced filtration technology that separates particles, bacteria and viruses from wastewater. GE’s ZeeWeed 500 membranes are reinforced, hollow-fibres that have been proven in more than two decades of wastewater treatment and water reuse.

The RO system implemented into the design, GE’s PRO Series RO system, will desalinate the treated sewerage/effluent to feed the cooling tower, which requires a pure water quality.

The PRO platform is a range of pre-engineered RO machines with their supporting components including multi-media filters, carbon filters, water softeners, chemical feed systems, tanks, and pumps for the building blocks of a full-scale configurable water system.
Results

By implementing the combination of products from GE, Sydney Airport Corporation was able to generate the quality of treated water required by the Department of Water & Energy (DWE). Additionally, the water used for the cooling tower also meets the additional requirements for low calcium and magnesium recycled water at all times.

Levels are measured each month to ensure compliance to these requirements.

Sydney Airport Corporation was also able to realize a 55-60% cost savings on potable water costs. By also not having to send their sewerage out as industrial waste, there are additional savings, bringing the total approximate costs savings for water coming into, and out of, the facility to over $500,000 annually.