

Utilities

Water

Glenelg Waste Water Treatment Plant

Client United Water International

Location Glenelg, South Australia

Value \$900,000

Duration February – November 2002

Project Background

SA Water Corporation is responsible for South Australia's water and wastewater services. It has contracted United Water to manage, maintain and operate water and wastewater systems in metropolitan Adelaide.

Under the terms of its contract, United Water is required to upgrade the operations of the four metropolitan wastewater treatment plants, including Glenelg, to increase the quality and volume of water available for reuse.

United Water awarded Nilsen Electrical the electrical works contract for the upgrade the Glenelg WWTP. In February 2002, Nilsen sub-contracted SAGE Automation to design and introduce a new control system to enable effluent flows to be synchronised throughout the upgraded plant.

The \$7 million contract to upgrade the Glenelg WWTP involved the decommissioning of the 70-year-old reactor A, which had reached the end of its useful life, the fit out and upgrading of reactors B and C and the construction of a new reactor D.

Project Overview

During treatment, effluent moves through a number of processes within the reactors to finally produce treated wastewater and bio-solids. The activity of specific microbes is fundamental in the activated sludge process with the concentration and growth of microbes directly related to the suspended solids concentration. Because these microbes rely on constant aeration and effluent flow to survive, the plant must be operational 24-hour a day. Without aeration, the microbes would quickly die and the plant would be unable to operate.

Two new aeration blowers were installed as part of the upgrade to act as the duty aeration blower facility with the four existing units becoming standby blowers. SAGE Automation was required to design a system that would automatically adjust oxygen levels by controlling the air flow into the effluent holding tanks and recirculate effluent through the plant.

This was achieved by the installation of cascaded PID loops to accurately control oxygen concentrations and variable frequency converters to manage the pumps that transfer the effluent.

Closed-loop PID algorithms control the pumps.

The plant's energy is largely derived from three 600kW engine-driven generators fuelled by digester or natural gas. Digester gas is the preferred fuel source, with natural gas generally used for top-up.

As part of the project, the existing co-generation plant was upgraded and incorporated into the power control system, which includes one 11kV MV control switchboard and two 415V LV control switchboards.

"SAGE Automation performed well on the job and left us with a robust system"

United Water International – Bob Pearce

Customer Outcomes

"SAGE Automation performed well on the job. It was a complex task involving the integration of the new plant into the existing facility, but they completed it on time and without having to rework things.

They satisfied the operators requirements relatively easily and left us with a robust system."

Bob Pearce, Engineering Manager, United Water International.

