CASE STUDY

CITY OF CHARLES STURT

Charles Sturt plans wisely for stormy days ahead

Beachfront with storm water pipe outlet at low tide

The City of Charles Sturt stretches from the City of Adelaide westwards to the coast. It covers an area of 5,474 hectares and has a population of 104,000, making it one of the state's largest councils. Founded on the first day of January 1997, the city offers a wide range of opportunities for housing, business, sport and leisure.

The council is responsible for the maintenance of 640 km of roads, 12 storm water pump stations and 12 km of coastline. The storm water pump stations were inherited from the previous council with some pump stations being up to fifty years old.

The pump stations need to work reliably when there are storms, because the area is mostly flat and without storm water control there is high risk of flooding. Long periods of dry weather also allow the build up of pine needles and other vegetation, which can choke the network pumps and pipes.

Fresh look at an old network

The civil maintenance department of the council is responsible for a wide range of civil issues, with pump stations a small part of the overall picture. In the nine years since the new council began, pump station problems have been addressed as they occurred and there has been little preventative maintenance.

In 2002, Paul Minks took over as pump management team leader in the civil maintenance department and began to look into the issues of long-term maintenance and planning. As part of the overall civil maintenance program an audit was conducted to look at the status of the pump network.

The existing network had 12 storm water pump stations. Some operated as booster stations and others pumped storm water into the river or the sea. Most stations were at least 30 years of age with pumps ranging from 400 litres/sec up to 1,500 litres/sec.

An installed dial up system on some pump stations, covered three basic faults – high water, pump failure and power failure, so when a phone call was received somebody had to go out at any time of the day or night to see what the actual problem was.

"We've had occasions where pumps ran constantly for a month without us knowing. A sonic monitoring system in one station was ghosting and picking up well water rising to high levels, when nothing was really happening."

Paul Minks

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Results are in

The audit demonstrated the existing system was not effective or efficient. Only half the pump stations were on the dial up system. The existing system was unable to meet current monitoring requirements and totally inadequate for future maintenance, upgrade and planning needs.

The department needed to be able to monitor pump station activity to save on call outs and to instigate an effective preventative maintenance program

These and similar issues are not unusual in Australia. One Queensland water authority made 2,300 site visits in a year just to reset pumps, with wasted hours costing well over $500,000. Even for a small council, wasted hours for site visits can still run into ten of thousands of dollars.

As a result of the audit, the civil maintenance department decided to see what SCADA systems were available for monitoring pump status and controlling pump operations. An existing council supplier was using MultiTrode SCADA products in other parts of South Australia and recommended the department look at the new MultiTrode PumpView system.

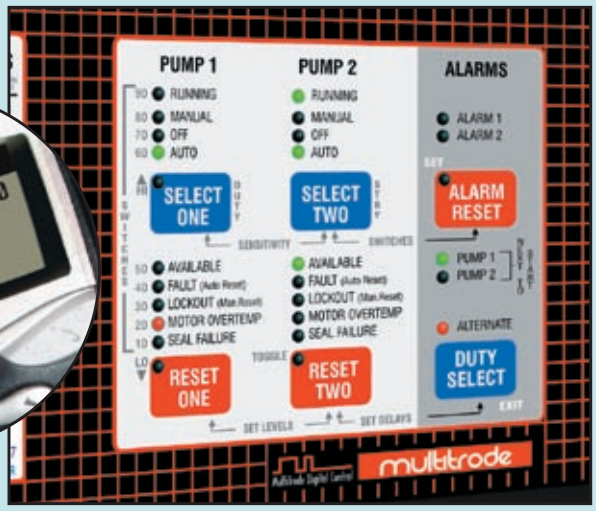
MultiTrode is a leader in pump station management systems. The company designs and manufactures level sensors, pump station controllers, pump station supervisors, SCADA software and web-based monitoring - PumpView.

PumpView allows monitoring and control of pump station faults and problems over the Internet. If a problem occurs, specific alarm notification is sent via mobile phone SMS messaging or e-mail to each user on the alarm list in turn, until the alarm is acknowledged. Most problems can be addressed over the Internet from home or office PC or laptop.

PumpView generates web pages showing status of the whole network. Alarms are highlighted and a user can check pump station levels, view fault status, reset pumps and alarms.

The system also delivers a broad range of historical data that can forewarn of impending problems with pump motors, electrical supply or potential blockages and serve as the basis for a proactive maintenance program.

Alarms are sent automatically to the web and to any nominated mobile phone via SMS



Detail of alarm on the pump controller

Single pump station trial

A demonstration of the newly available PumpView system led to a trial in one of the council pump stations. PumpView was chosen because of its ease of operation, and comprehensive pump station monitoring and control.

"The PumpView system was installed and we were able to look at faults, reports, monitor levels, pump starts, hours, alarms, high levels…everything all remotely.

The big advantage was being able to respond to an SMS message, see what the problem is and fix it any time of day or night, from work, my laptop or from my PC at home.

The manager thought it was great. Ideally we want to put all pump stations onto the new system. This will save us money on new equipment as well as savings on call outs and other false responses that used to cause us problems."

Paul Minks

Any PC with an internet connection can be used to monitor and control the network

More pump stations upgraded

Following the trial another three pump stations were upgraded to the new system. All four sites are now complete, and were fully operational at the end of only a one day commissioning period.

Inspection of the pump reports during training the next day indicated a problem at one site, with the pumps recording a large number of starts for no obvious reason.

Visiting the site proved that the level device was faulty and the pumps were being started dry. As a result, the MonitorPro tripped the pumps after a short period on undercurrent. Had PumpView not been installed, the fault would have gone unnoticed until the 30 kw pumps burnt-out resulting in an expensive repair bill.

Easy to use

Pump stations can be monitored and controlled without costly investment in technology. This is especially useful to smaller authorities that can't afford expensive consultants, continual IT expansion, software upgrades and documentation.

The new MultiTrode PumpView system lets users view and control a pump station from anywhere in the world via the Internet. It uses a private and secure web page based control system that is easy for anyone to use.

"The system is very sophisticated but not complicated. I'm not an electrician but I can run the system with no problems.

It's a great tool for showing people what's going on. We have shown some of the councillors and others how storm water is managed and they could see for themselves. It's a great educational tool."

Alan Chesters – Workgroup Leader

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Planning for the future

Used as a management tool, PumpView can reduce staff overtime, wasted calls outs and help provide enough information for preventative maintenance scheduling and planning for future upgrades and expansion.

With 14 kilometres of coastline and sandy beaches attracting hundreds of thousands of tourists the council can't allow pump stations to come on any time they want. Pump out times have to be appropriate to visitor needs with properly planned cycles.

"Because we pump out onto the beach we need to do it when the tide is high so that dirty water gets carried away, not onto the beach at low tide.

The system allows for routine maintenance checks that match the workload of each pump. Sometimes a pump will only have run for a few hours so it doesn't need to be taken out for maintenance."

Alan Chesters

PumpView delivers daily reports, with all history kept in an on-line database, so managers can look at trends. Comparisons of seasons, and month by month pump station performance allows planning for different cycles and settings that are most appropriate.

"This means we will be able to save on power cost and call outs as well as planning for maintenance. We've already saved money by stopping pumps running when they shouldn't have been.

Ideally we want to put all pump stations onto the new system. We plan to add another 4 or 5 in 2005 with the rest to follow. I reckon PumpView is a great tool."

Paul Minks

Alan Turner & John Nagel (Treliving Engineering) with Alan Chesters (Charles Sturt City Council) conducting a pit inspection.

PumpView for all

SCADA is no longer something that only large water authorities can afford to implement. The PumpView system eliminates most of the unknowns, allowing engineers, electricians or other personnel to fix many problems remotely.

This means that skilled personnel can be best used where they are needed. And archived data and trends offer the necessary resource for planning and maintenance.

The benefits experienced by authorities such as City of Charles Sturt can now be enjoyed by authorities of all sizes wherever they may be located.

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