

St Andrews takes control over sewage pumping and safeguards the home of golf

MultiSmart™ reduces call-outs and cuts energy costs by more than 23%

After installing Flygt MultiSmart™ Intelligent Pump Station Manager (iPMS) at its existing terminal pump station, the historic town of St Andrews in Scotland reduced energy costs by more than 23%, eliminated weeks of man-hours spent on nuisance call-outs and minimized both operational and capital expenditures.

Background

With its sandy beaches, famous university and world-class golf course, St Andrews holds legendary status in Scottish history. Sometimes called “the home of golf,” its lush green links date back to 1754 and are located on the dramatic Fife coast, north of Edinburgh. The town’s sewage pump station is also located in the harbor, meaning that any overflow ends up in this harbor and onto the adjacent beaches, which presently have Blue Flag bathing standard status.

The original installation consisted of three 50kW pumps using variable speed drives (VSDs) in a duty / assist / standby configuration. Control of the pumps was handled by a programmable local control (PLC) receiving level signals from an ultrasonic sensor. Backup pump control was ensured using float switches.

“The result has been a considerable drop in the number of call-outs by operation staff. The call-outs are now only for genuine problems.”

The challenge

The real challenge for St Andrews was erratic supply voltage fluctuations that resulted in constant call-outs of operational staff for pump resets. The fluctuations also damaged the VSDs, causing one unit to be replaced every year, in addition to other repair costs. It was not uncommon to have several pump cut-outs per month due to voltage fluctuations outside preset limits. During a two-week period alone, St Andrews sustained 164 voltage fluctuations, many of which would have required manual resets, data later showed.



St Andrews is situated on the Fife coast, Scotland and is world famous for golf.

Customer:	St Andrews, Scotland, UK.
Challenge:	Overflows, mains voltage fluctuations, call-outs, energy consumption.
Solution:	Flygt MultiSmart™ iPSM, current transformers.
Results:	23% energy reduction and 5-10 fewer call-outs per week.

The solution

Tired of tying up staff for hundreds of hours to remedy basic call-outs with simple resets, the local water company management decided to take full control over their pump station with a Flygt MultiSmart Intelligent Pump Station Manager (iPSM) solution.

The unit was installed in a spare compartment in the motor control center (MCC). Current transformers were also installed for each phase of the three drives and wired back to the MultiSmart unit. Great care was taken to ensure that the control inputs and outputs did not interfere with the existing control system so that redundancy was built into the system. During the installation period, two pumps were always available for control, and the backup control from the float switches was left in place.

The final retrofit consisted of MultiSmart as the primary control, with information being fed to it using existing instrumentation and the additional current transformers. The existing PLC system served as the backup, with the float switches acting as the emergency system.

The result

MultiSmart virtually eliminated nuisance call-outs due to mains voltage fluctuations. An examination of the integrated event and fault logs showed that, on average, four events per week during the trial were detected and resolved by MultiSmart.

By glancing at the easy-to-read user interface, operations staff could easily see when a fault occurred and what events preceded it. This allowed them to focus on genuine problems such as physical blockages that really did require hands-on intervention. As it happens, the first summer with MultiSmart was the first time there were no major incidents that might have affected the Blue Flag status of the beaches.

Energy savings was another benefit, since MultiSmart was configured to automatically alternate pumping in favor of the most energy-efficient pump. This was determined by calculating the volume of the wet well to measure the flow and correlated against energy consumption to define the specific energy of each pump in L/kWh. The result was a 12% reduction in energy usage, despite a 15% increase in inflow - a total of 23.5% energy cost savings during the trial period.

Despite frequent storms and heavy rainfall, the results were very favorable and St Andrews is looking into future improvements, such as preventive maintenance and network management. In the meantime, the home of golf is preserved.



The intuitive MultiSmart interface displays real-time event and fault logs showing when a fault occurs and what events preceded it.



With a total of seven courses, including the world-famous Old Course, St Andrews holds iconic status in the world of golf - meaning that sewage overflows in the harbor are out of the question.