CUSTOMER CASE STUDY

System Platform Ensures Environmental Success at Branston

Branston - www.branston.com
Food and Beverage

Goals

- Provide a water saving solution to meet environmental, cost and competitive requirements
- Provide a geographically disposed solution for monitoring architecture Wonderware Solution

Challenges

- Overcome geographical spread of business with a single solution
- Ensure that water treatment consistently meets regulatory framework

Solution

- System Platform
- InTouch® HMI
- Historian
- Information Server

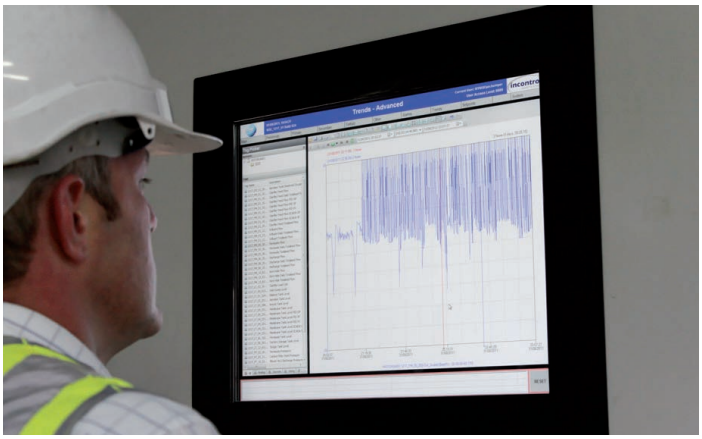
Results

- High availability of water in a closed system for product washing
- Water cost reduction
- High benefit to surrounding environment

Seavington, Somerset, United Kingdom — Branston proudly says that “Potatoes are our business” and has been in the supply of high quality potatoes since 1968. They have sites in Lincoln, Scotland and the South West, and they work with some of the country’s most progressive growers to make sure they always bring Britain’s best potato crop to their customers. This has made them a leader in this market. Their South West site is at Seavington near Ilminster, and it is here that a radical new method of water treatment has produced both operational savings and delivered enhanced environmental credentials with many beneficiaries. The project was undertaken by Derbyshire based MSE Systems in conjunction with InControl Systems using manufacturing automation software products from Wonderware.

On the face of it, cleaning and packaging potatoes for retail sale is a simple operation. However, water usage has significant economic and environmental issues. In today’s markets all aspects of processing are placed under scrutiny and Branston knew that their water usage needed to be improved, not only for their own benefit but for the stringent requirements of supplying a major retailer.

Water in large volumes is needed to process the potatoes and this was causing significant cost and environmental concerns to Branston. They have a borehole on site, with water abstraction undertaken with a regulated license from the Environmental agency. Mains water is also available to the site but with some supply restrictions. Branston needed a safe method to recycle the water rather than continuously drawing water and contacted MSE Systems, a company specialized in the design, construction and installation of complete waste water treatment plants, for a solution.



Membrane BioReactor

MSE Systems supplied a complete water treatment plant, which more properly is a Membrane BioReactor (MBR), which has achieved the customer’s requirements. MBRs combine activated sludge treatment with a membrane liquid-solid separation process. The membrane component uses low pressure microfiltration and eliminates the need for conventional clarification techniques and tertiary filtration.

The process of recycling the washing water is complex as the water has to be purged not only of the inevitable soil content but also of the nitrogen and phosphorus within it from fertilizers and from organic contamination. Other aspects of repeated water use such as chemical build up were anticipated and these were dealt with through granulated activated carbon absorption. The filtering and treatment process includes solids separation, aeration, carbonaceous oxidation and nitrification, final membrane filtering, granulated activated carbon absorption, ultra-violet treatment and chilling to 10°C for reuse. Branston has laboratory equipment to monitor the system and to analyze the water which confirms environmental compliance and provides data to operate the plant. This equipment is located at Branston’s South West site where the analysis for this site and the Lincoln site is carried out. Up to 90% of water at the South West site is now recycled, with any waste being safe to return to the public system.

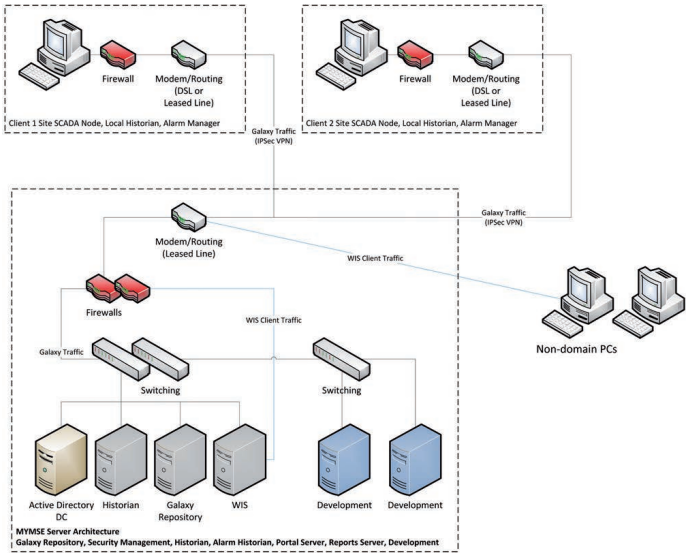
The MBR system is in delicate balance because the anoxic tank has zero oxygen, or anoxic conditions, being neither anaerobic nor aerobic. Nitrates within the suspension are converted to gaseous Nitrogen and discharged to the atmosphere. Organic elements are also completely removed by the process. The resulting 'clean' solid sludge is deposited to a trailer for distribution to local farms.

A particular technology which is deployed in the system is membrane filtering. The membrane tank is approximately 2.5m long x 2.5m wide is sized to house one membrane tower comprising four modules. High area ratio gives low hydraulic flux rates thus maximizing membrane life. The plant has a current throughput of 160m3/day. MSE Systems utilized Mitsubishi Sterapore™ SUR hollow fibre membrane units which are designed to provide biological treatment in abattoirs, beverage production, chemical industry, food processing, municipal wastewater, pharmaceutical and tank cleaning applications. In particular the fully oxidized and zero solids permeate allows for clean effluents which can be reused.

Visualization and Automation

The control and automation of the plant was undertaken by InControl Systems, provider of turnkey solutions for process control, automation and information systems using Wonderware technology. The Seavington site was already using Wonderware InTouch SCADA and data collection, with PLC control using a Rockwell CompactLogix.

The automation system had 25 closed loops and 50 analogue monitoring points. The InTouch SCADA which visualizes the entire system was used in plant tuning as well as continuous monitoring of plant operation. However, this system was already applied at the Lincoln site so the South West site was integrated to the county-wide automation architecture which uses a centralized system (located at InControl Systems) and thereby keeps the IT infrastructure requirement at 'client sites' to a minimum.



An Integrated Information Service

MSE Systems knew that their MBR water treatment installations would require monitoring for optimum performance and in particular to ensure that the membrane filter system was running to specification. This requirement, as well as numerous other monitoring and remote access requirements, was integrated by InControl Systems to produce the 'MyMSE' Server Architecture.

MyMSE is based upon System Platform technology which has allowed master objects to be developed for such applications. In use, these well developed and tested objects are simply deployed repeatedly to produce the particular application. This has the effect of project development and commissioning time being reduced owing to thorough master object development and subsequent use of multiple instances of each object. PLC programming is also pre-specified by each master object, bringing standards to bear at the PLC level and the two aspects of PLC control and Supervision becoming tightly integrated.

The centralized system provides historization of data from all sites using Wonderware Historian and subsequent information dissemination by Wonderware Information Server, access control which is managed by Microsoft Active Directory.

Detailed trend displays are available to all users, centrally, at client site, and remotely via 'zero-touch' web browsers. The trends offer particular insight to the process and have been of particular use both in process tuning and in on-going monitoring. Any event on the plant can readily be ana lysed using these trends to determine fault root cause. Further development of the system has produced a report of the ten most frequent alarms which is ideal for prioritizing engineering effort. This centralized / client site architecture, especially with remote access to the plant, has streamlined development and is stated to have reduced engineering call-outs by 90%, the effect being that Branston can run the plant themselves.

Geo-SCADA

The use of System Platform creates a library of tested master template objects which are held centrally within the 'System Platform Galaxy Repository'. Instances of these templates are deployed to each site as required. Additional clients and their site deployment are thus readily facilitated. This also helps with Continuous Improvement as master template objects can be updated and the resultant changes deployed remotely.

A further development of the core central system will allow extended Geo-SCADA functionality. This will display each client site on a map with an instant indication of status and of any alarms. This feature will ensure that any problems are dealt with immediately. MSE and InControl will also be able to respond to any client site plant and control problem by instantly being aware of an issue and also by periodically monitoring particular aspects of the plant from a long term view of availability.

Jan Hemper, InControl Systems, said, "System Platform was the ideal solution for this geographically spread project owing to its functionality and also to its efficiency in application development engineering."

Customer Benefit

Branston's General Manager at the South West site, Ian Wait, said, "The system provided by MSE and the information technology from InControl takes care of management expectations for the water treatment plant." Ian added that he has web access to the system at any time and from any location. Remote access information has been augmented by the use of advanced diagnostics developed by InControl which utilize Wonderware Information Server 'Web Parts' in conjunction with Microsoft SharePoint: this allows authorized users to automatically obtain their required selection of reports by email.

The system also records use of the site's borehole water abstraction and produces reports and readings that used to ensure that the site is within their Environmental Agency's license. Furthermore a complete overview of water inputs and outputs to the site, which is measured by flow meters, is automatically maintained in the site's history and corresponding trend displays.

The project was overseen by Branston's Development Project Manager, Heiko Gramsch, who said the system met with all requirements and that it delivered significant business benefits in utility saving, in meeting retailer's environmental expectations and in the smooth running of the site. The company has announced, "By working with several local agencies, we have successfully created a water recycling unit which, after just a few months of being up and running, is reducing our mains water usage by an incredible 52%."