

beverage plant optimizes operations

a customer reduces plant water consumption and reduces operational costs through the Lifecycle Services Agreement

Application: Prefiltration for beverage industry

Design Capacity: 0.756 MGD (2862 m³/day)

Location: Ontario, Canada

Date Commissioned: 2002

Date of Analysis: December 2012

challenge

A food and beverage plant located in Ontario, Canada produces bottled beverages and has a strong focus on product quality and consistency. The plant utilizes high purity water as a primary ingredient in its products and uses ultrafiltration (UF) membranes and reverse osmosis (RO) treatment, followed by activated carbon filter and ozone disinfection. Aside from maintaining and improving product quality, the company also puts a strong emphasis on environmental sustainability.

As part of the facility's 2013 Resource Conservation program, engineers hoped to reduce the plant's water use ratio (WUR) and decrease yearly process water consumption by 5 million gallons. Due to the sophisticated design and nature of high purity water systems, a good understanding of equipment and processes is crucial for troubleshooting and carrying out continuous improvement strategies. Since 2002, the facility has had a partnership with SUEZ as part of the Lifecycle Services Agreement. The Lifecycle Services Agreement is SUEZ's single-source, multi-faceted service package that combines necessary technical and consumable material supports for the customer. As part of the agreement, the plant had a single source for all the expert and collaborative technical support, and a customized portfolio of services all under one fixed monthly fee.

solution

Through the Lifecycle Services Agreement, the SUEZ team worked in close collaboration with the engineers and operations team at the plant to take the necessary steps to achieve their resource conservation goals. The SUEZ team carried out a three-week process audit on the RO system, UF trains, and the backwashes at the plant and investigated areas for improvement. After carrying out a root cause analysis on the different sources of water consumption, the backwash interval for the UF train was identified as a good starting point to reduce the WUR in the plant. The different services under the Lifecycle Services Agreement collaboratively helped the customer achieve their water usage reduction goals.

plant audits and onsite technical support

In partnership with the plant operations team, the SUEZ onsite support team carried out a comprehensive review of the process, mechanical, and controls operations of the plant. As a result of the audit, the plant operation teams identified key areas for improvement to reduce water consumption and decided to target the frequency of backwash intervals for the UF trains.

Subsequently, as the backwash parameters were changed, SUEZ field service representatives (FSRs) made frequent visits to the site to monitor the general performance of the membranes and understand the effects of the reduction of backwash intervals on the system. As the backwash interval changes were made, the FSRs were required to carry out programming and controls changes, which included set point changes on the human machine interface (HMI).

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InSight Pro and offsite technical support

The plant was equipped with InSight*, SUEZ’s remote monitoring and diagnostics platform. As part of the InSight Pro service, the customer was paired with a SUEZ process analyst who worked collaboratively with the plant’s operations team to provide recommendations and technical support to improve plant performance. The process analyst was able to remotely access plant and water usage data to make recommendations to reduce water consumption.

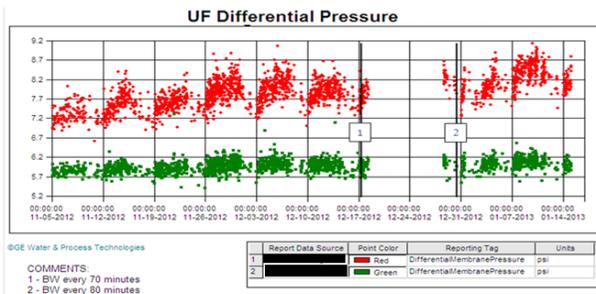


Figure 1: InSight platform shows that transmembrane pressure did not change once the backwash intervals were reduced

While the performance data was being analyzed and the reduction in backwash intervals for the UF train were being recommended, the SUEZ process analyst remotely monitored the key performance indicators to ensure that transmembrane pressure (TMP) was maintained and water quality did not deteriorate. As a result, the process analyst worked with the plant operations team to reduce the number of backwash cycles and significantly decrease annual water consumption (see Figure 1).

results

In collaboration with the SUEZ services team, the customer was able to reduce the frequency of their backwashes by increasing the intervals between cycles from hourly to every 100 minutes. As a result, the customer reduced water consumption in the UF train by 40% and saved more than \$32,000 annually.

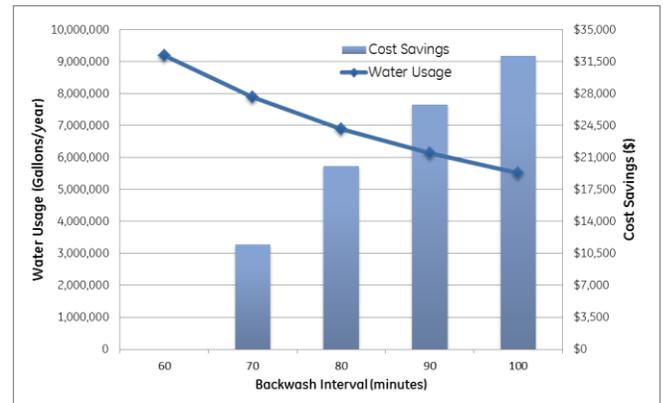


Figure 2: Cost saving increased as a result of reduced water usage

By surpassing the goals initially set in the project, the plant tied the reduction of water usage into a Six Sigma project through the DMAIC (Define, Measure, Analyze, Improve and Control) improvement strategy. The plant could potentially use these results to take the necessary steps and implement these changes in the different plants across North America. The various company plants in North America could further benefit from the operational cost savings and reduced water consumption as a result of execution of this project on a larger scale. SUEZ’s Lifecycle Services Agreement helps provide customers with the highest level of service and expertise through their 30 years of experience in designing, operating and maintaining beverage ingredient water systems.