

Sievers* InnovOx On-Line TOC Analyzer chosen by chlor-alkali production facility

challenge

Chlor-alkali manufacturing plants use saturated brine and electricity with advanced membrane technology to produce chlorine for a variety of products such as pure bleach, caustic soda, and other chlorine-related products. Excess organic contamination of the brine can reduce membrane systems efficiency, leading to membrane fouling and equipment downtime. Thus, improved organics monitoring of ultra-pure brine streams in manufacturing is vital to equipment protection and production uptime.

A chlor-alkali production facility in Northern California utilized laboratory Total Organic Carbon (TOC) analysis to monitor organics in its ultra-pure 30% brine for protection of its advanced membrane technologies. However, its laboratory TOC instrument relied on high-temperature combustion oxidation and could not meet the requirements of continuous operation. This prompted the lab manager to initiate a search for an online monitoring solution that could be used to control production processes while meeting reliability, robustness, and uptime requirements.

solution

A Sievers* InnovOx On-Line TOC Analyzer demonstration unit was provided for field testing. The Sievers InnovOx On-Line is designed for continuous, accurate measurement of organic carbon in water streams ranging from brine solutions to steam condensate and wastewater.

This chlor-alkali facility installed the Sievers InnovOx On-Line to monitor the brine supply going from the brine ion exchange unit to the ultrapure brine storage (**Figure 1**). This provides continuous data about the brine composition which allows data-driven process decisions to protect the membrane systems.

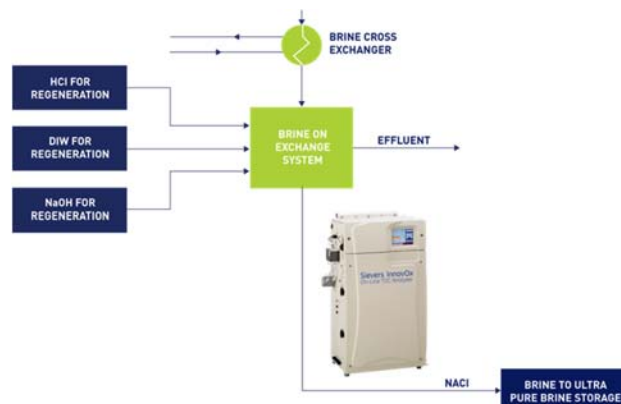


Figure 1. Placement of the Sievers InnovOx On-Line TOC Analyzer to monitor brine supply from the brine ion exchanger to the ultrapure brine storage

This solution included a NEMA 4X enclosure with a Vortex Cooler. The slightly pressurized enclosure served a dual purpose by cooling and purging the chamber to prevent the ingress of corrosive gases. After several months of testing, the Sievers InnovOx On-Line solution was adopted and a new unit was installed. Now, the facility obtains TOC measurements from both lab and on-line for comparison and verification of performance. Typical measurements are around 2 ppm TOC (**Figure 2**) and are validated with a 5 ppm carbon sucrose standard.

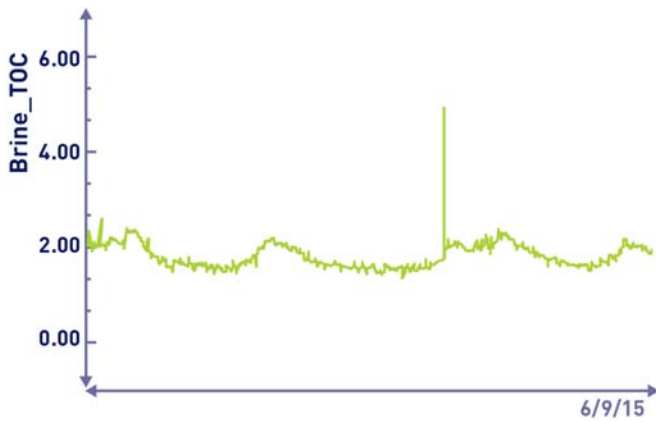


Figure 2. TOC measurements obtained using Siever’s InnovOx On-Line TOC Analyzer to monitor brine supply at chlor-alkali plant

A preventive maintenance schedule (**Table 1**) was developed to minimize the risk of unscheduled downtime during critical operation. The maintenance requirements for the Sievers InnovOx On-Line can be further reduced by implementing the standard, two-stream capability for automated fresh water rinses.

Table 1. Preventative maintenance schedule for the Sievers InnovOx On-Line TOC Analyzer

Frequency	Duration	Actions
Weekly	10 minutes	<ul style="list-style-type: none"> Inspect Replace water in GLS
Monthly	30 minutes	<ul style="list-style-type: none"> Replace acid Replace dilution water Replace 5 ppm check standard Replace oxidizer Replace reactor seals Replace tubing

results

The company purchased the Sievers InnovOx On-Line following evaluation and is very satisfied with the online monitoring solution.

Key decision-making criteria included:

- Data precision and uptime
- Improved data and advanced knowledge of contamination to the membranes

Even for challenging applications such as in the chlor-alkali industry, the Sievers InnovOx On-Line enhances performance and uptime.

With application-specific sample preparation, robust sample handling, and industry-leading Supercritical Water Oxidation (SCWO) technology, the Sievers InnovOx TOC Analyzers provide accurate and reliable TOC measurements. Continuous data provided by the Sievers InnovOx On-Line allows manufacturing plants to make confident decisions that protect equipment and maximize production.