

RO System Eliminates Caustic Chemicals and Saves \$150k for Leading Wax Manufacturer

Challenge

For more than 50 years, industries worldwide have commended the undeviating quality of The International Group, Inc. (IGI), a manufacturer of petroleum wax based products. Also known for its commitment to saving the environment, IGI has established many high level technical projects to address the problems of waste utilization and the impact of products on the environment.

William (Bill) McQuade, Plant Manager, recently set an objective to improve the plant's pre-treatment of incoming city water, which feeds the company's steam boiler system. The existing ion exchange systems used concentrated sulphuric acid and sodium hydroxide, chemicals that posed significant safety concerns when stored onsite. Furthermore, the chemicals caused dramatic swings in the plant's effluent pH as they were sent to drain, making it difficult to maintain a neutral pH in the plant's final effluent.

Bill wanted to discontinue the use of sulphuric acid and sodium hydroxide for the ion exchange systems in the boiler room and improve on the steam boiler system's efficiency, as a cost savings measure. Since IGI's steam plant produces approximately 1.5 million pounds of steam per day, 7 days per week, 360 days per year, it was apparent that the cost savings could potentially be dramatic.

Ultimately, IGI needed a reliable system that would reduce operating costs, make the boiler room a safer place to work, and, most importantly, reduce the amount of chemicals the company was using in the boiler room and sending to the sewer each year.

Solution

GE Infrastructure Water & Process Technologies designed a 150 GPM Reverse Osmosis (RO) system. The system pretreats the incoming city water, prior to the water being fed to the steam boiler system. The RO rejects 98% of the dissolved minerals within the city water, allowing the steam boilers to operate at 100



cycles of concentration versus 10 cycles with the old ion exchange systems. In addition, GE chemically treats the steam boilers, various cooling water systems, the closed systems, and certain process streams within the refinery.

Results

The GE RO system has been an unmitigated success. Not only has it reduced IGI's boiler system operating costs by over \$150,000/yr by increasing steam boiler's efficiency over 3%, but it has also totally eliminated the use of sulphuric acid and caustic in the boiler room. Additionally, it has reduced the amount of boiler blowdown by 10% and reduced the salt discharged to the sanitary sewer by the steam plant water softeners by 70 times its previous amount.



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