

# Southeastern Ethanol Plant Reduces Plant Downtime and Overall Energy, Water, and Treatment Costs

## BACKGROUND

A joint effort between ChemTreat and its customer resulted in significant plant savings from reducing plant downtime and improving the plant's water management programs. ChemTreat began servicing the 110 MM GPY ICM facility in 2009. The plant had just come out of start up and was having several operational challenges.

## PROBLEM SUMMARY

- Steam purity issues were negatively affecting alcohol production rates.
- Water treatment systems were not operating at peak efficiencies.
- Plant personnel were growing increasingly dissatisfied over the lack of technical support and service they were receiving.
- On-site service consisted of running tests and reporting out-of-spec chemistries.

## CUSTOMER OBJECTIVES

ChemTreat's approach was to implement a true water and energy management program by providing experienced representatives committed to helping the plant reduce operating costs.

## RESULTS

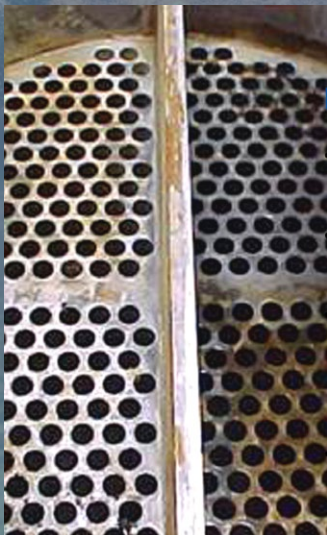
Upon taking over the plant's water treatment service responsibilities, our onsite representatives put together a service plan that was tailored to the customer's needs in order to address the following:

### **IMPROVE STEAM PURITY ISSUES**

Since carryover was causing deposit problems on the plant's steam control valves, this was deemed a top priority. The plant had to be taken down on a regular basis to clean the steam side of the control valve. Several recommendations were made to change the way the plant fed and controlled the boiler water treatment chemicals as well as increased operator training and the use of a boiler antifoam. The improvements were significant in eliminating ~ 1% downtime, which led directly to increased alcohol production (~\$2 MM/year savings).

### **IMPROVE RO TREATMENT PROGRAMS**

The RO system consists of a single 200 gpm Itasca RO. New low fouling membranes were ordered to replace the current membranes that were rejecting less than 90% of the incoming TDS  $\mu$ mhos. The RO recoveries were also increased from 70 to 80%. The overall impact was the improved RO permeate quality of 98%+ rejection while operating at a higher recovery rate. The plant spends less on water and treatment cost when operating the RO.



## RO TREATMENT PROGRAM IMPROVEMENTS

<b>BEFORE</b>		<b>AFTER</b>	
	<b>Flow (gpm)</b>		<b>Flow (gpm)</b>
RO Feed	230	RO Feed	202
RO Permeate	161	RO Permeate	162
RO Concentrate	68	RO Concentrate	42
Recovery	70%	Recovery	80%
Rejection rates	< 90%	Rejection rates	> 98%

### ***INCREASE BOILER AND COOLING TOWER CYCLES***

Both the boiler and tower chemistries were operating comfortably based on the level of dissolved solids (impurities). By working together, system control was improved which allowed the facility to raise system limits in order to reduce the amount of water and treatment that was required. The average boiler cycles of concentration was increased from 40 to 75, which saved over \$60,000/year.

The cooling tower cycles were increased from 4.4 to 8.3 which saved \$50,000/year on water and treatment costs.

### ***BENEFITS***

The overall improvement in the plant's water management programs helped to eliminate concerns with the plant's outfall limit, which was set at 128 gpm during start up. Today, the average outfall flow rate is 70 gpm which is a 45% reduction in outfall flows. The current water balance is well within the design limits submitted in their construction permit.

### ***CONCLUSION***

A successful water treatment program can often be traced back to following the on-site experience and leadership of the service representative. A true water and energy management program may show a return on investment that helps to offset the cost of treatment chemicals. The annual ChemTreat costs were a small percent to the overall joint savings that were achieved. This helps to establish a long term partnership— something that ChemTreat strives to achieve. If we can be of any assistance or if you have any specific questions on how ChemTreat can help you with your water treatment systems, please contact us at 804-935-2000.

*A 1% reduction in plant downtime saves 1.1 million gallons of ethanol per year.*

*At \$2.50 per gallon, the ethanol value is \$2.75 million dollars per year.*