



# 3D TRASAR™ Technology improves cooling water efficiency resulting in financial, operational and environmental improvements at a petrochemical plant



## BACKGROUND

Safe operations, reliable processes and controlling costs were key goals of this plant. However, the plant's ability to meet those goals was being compromised by an inadequate water treatment program. This led to heavy fouling of a critical heat exchanger. To maintain the required heat transfer efficiency, this critical exchanger required cleaning and/or replacement every year. Even with these actions, the exchanger's U coefficient dropped quickly, 2 months after cleaning or replacement. The plant knew something had to change and Nalco was asked to survey the site.

## SOLUTION

The Nalco team completed a mechanical, operational and chemical survey of plant operations. All parameters were analyzed to fully understand the factors contributing to the fouling problem. It was

determined that the competitor's phosphate-based program was not designed to provide adequate protection at the heat exchanger's design skin temperatures of 120°F. The supplier's controller did not allow for adjustments in chemical feed due to changing conditions, nor did it track or trend data. The plant felt it would be advantageous to understand the effects of operational and production changes on their system. Knowing what events are causing performance changes provides more information, which in turn would help the team facilitate sound operational decision, resulting in reliable and efficient operations.

The Nalco team completely redesigned the water treatment program and implemented best practices to ensure system performance. With the goals of increasing heat exchanger performance and reducing operation costs, the plant converted from the competitive program to Nalco's

### CUSTOMER IMPACT



### ECONOMIC RESULTS

Extended cooler life at least 2 years and increased operation uptime due to less cleaning and equipment replacement



This results in \$560,000 per year of cleaning and replacement savings

Saved 13 million gallons

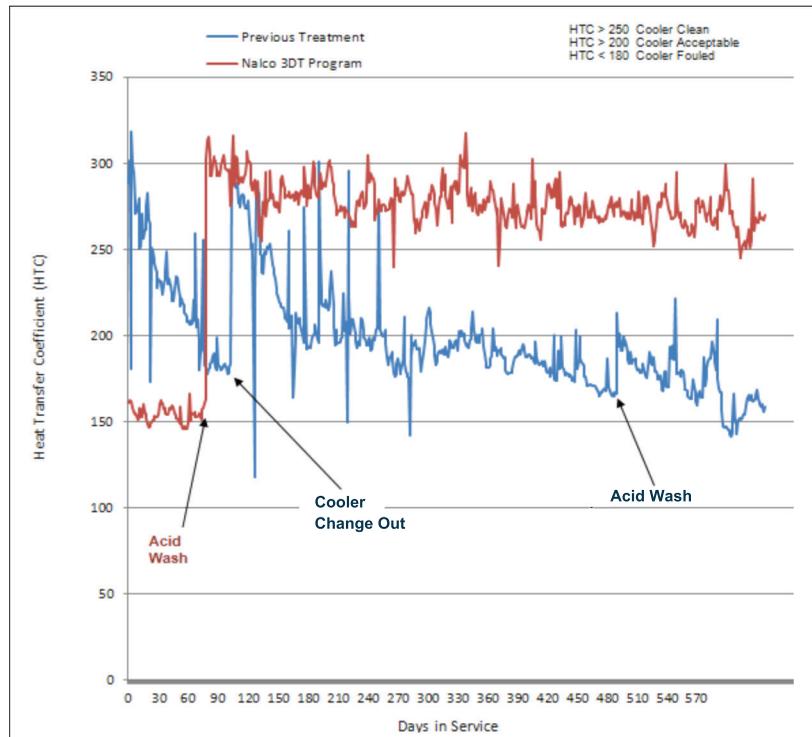


Recognized cost savings of \$27,500

*eROI is our exponential value: the combined outcomes of improved performance, operational efficiency and sustainable impact delivered through our services and programs.*

patented 3D TRASAR technology. 3D TRASAR technology is a unique combination of innovative chemistry, monitoring and automated control that allows for continuous and direct measurement of the leading indicators of scale, corrosion and fouling. It detects upset conditions and takes appropriate correction actions before they become problematic. It also utilized Nalco's patented PSO chemistry, which provides cathodic corrosion protection without the concerns of reversion to orthophosphate.

Once the program was implemented, exchanger fouling was significantly reduced. Plant heat exchanger U coefficient data confirmed this and is shown in Figure 1. The new program demonstrates better control in critical heat exchangers. Using Nalco's sophisticated computer modeling and real time system monitoring and control, the team was also able to safely increase the cycles of concentration providing the plant with significant water savings. Once 3D TRASAR automation was installed new, otherwise unknown information became evident. By trending changes in the circulating water turbidity it was determined the side-stream filter was not working properly contributing to high circulating water turbidity. The filter was repaired and the problem was corrected.



**Figure 1** - Nalco 3D TRASAR technology ensures reliable operation of critical cooling systems with a 38% improvement in U coefficient.

### THEIR SUCCESS

Plant run length has significantly increased. It has been two years since the exchangers were cleaned or replaced due to loss of heat transfer efficiency. This has resulted in \$560,000 annual maintenance savings and capital cost savings. Improved tower performance reduced annual water use by 13 million gallons, and has provided additional water cost savings.

Nalco System Assurance Center further ensures systems are performing as expected. Proactive alarm response and documentation has given this plant peace of mind that their system is performing reliability and cost effectively 24/7/365.

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