

# Nalco Water System Reliability Consulting Program Saves Customer Over \$645K by Optimizing Cleaning Schedules and Prolonging Heat Exchanger Life

## CASE STUDY

### ► INTRODUCTION

Reliable heat exchanger operations are critical to ensuring a plant's profitability, minimizing downtime and better planning for turnarounds. The Nalco Water System Reliability Consulting Program is a comprehensive program for the monitoring, visualization and analysis of

heat exchanger performance. HEAT is a digital platform, viewed on ECOLAB3D, which provides unparalleled visibility into the process exchanger network, enabling improved asset reliability.

### ► BACKGROUND

A Gulf Coast petrochemical plant was faced with significant cooling water heat exchanger fouling concerns during a previous turnaround. Due to a lack of visibility into heat exchanger performance, the customer had an arbitrary maintenance plan in place. As such, heat exchangers were being cleaned when they didn't need to, or being cleaned too late, causing an interference in cooling water

operations — leading to production losses, increased labor costs and unnecessary exposure to hazardous operations. Multiple heat exchangers saw significant pitting corrosion due to low water flow-rates caused by fouling. The customer previously did not have a baseline for flow and temperature performance to understand degradation over time.

### ► SOLUTION

There was an opportunity post-turnaround to begin building a database of heat exchanger survey data. Quarterly surveys enabled the customer to trend heat exchanger stress and performance metrics like water velocity, heat flux, and skin temperature and to see the effects of chip scale and other foulants over time. By utilizing this survey data and Nalco Water recommendations, the customer made informed decisions to optimize upcoming maintenance operations.

With the introduction of the HEAT digital platform, the customer was able to create a historic survey database, quickly trend data, display high-level summaries for management, and identify problem exchangers. It also provided users the capability to sort the data by sub-unit, promoting accountability for each of the processing areas. Now managers, supervisors and engineers can quickly view all exchangers within each unit to assess and understand the most at-risk pieces of equipment.



#### ANNUAL SAVINGS



**ASSET PROTECTION**

**\$520,000**

Approx. savings on heat exchanger life



**COSTS**

**\$120,000**

Increased savings on cleanings



**PRODUCTIVITY**

**30 hours**

Saved on hazardous labor

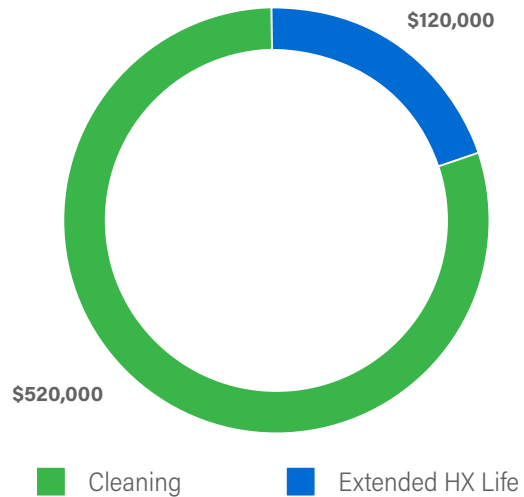


**TOTAL VALUE DELIVERED**

**\$640,000**

## ▶ RESULTS

During the winter cleanings, the survey data allowed operations to prioritize the most at-risk exchangers. By doing this, six exchangers were removed from the cleaning list after showing good performance, thereby preventing unnecessary cleanings that would have cost approximately \$120,000. It also helped identify six other exchangers for cleaning that were not previously on the list. The plant determined that three exchanger bundle replacements could be postponed given that they didn't show a decline in performance, translating to \$520,000 in additional savings. In total, prioritization stemming from the System Reliability Consulting Program saved the site \$640,000 in unnecessary cleaning and bundle replacement costs. Additionally, the intuitive user interface of the HEAT web application facilitated performance transparency throughout the site, raising awareness and facilitating proactive solutions.



**FIGURE 1:** HEAT Exchanger (HX) Maintenance Savings

## ▶ CONCLUSION

After seeing a sharp decline in heat exchanger performance and reliability during a previous turnaround, Nalco Water representatives proposed the implementation of the System Reliability Consulting Program which provided better visibility into the system's performance. The survey data, along with Nalco Water expertise, enabled the customer to increase system performance and reliability, while decreasing overall maintenance costs.

This technology has delivered more than \$640,000 in annual savings by avoiding unnecessary asset replacements and optimizing cleaning schedules. The Nalco Water System Reliability Consulting Program is now an established service at the site, and the plant expects to continue realizing yearly savings through this program as Nalco Water further optimizes heat exchanger reliability and maintenance operations.