

# Refinery Saves \$238,000 Annually With TITAN<sub>360</sub><sup>TM</sup>

## Background

A refinery was experiencing high levels of corrosion in its carbon oxide (CO) boiler for several years. The boiler system consisted of a 507-psig boiler that produced 78 ton/h of steam with demineralized water as the makeup, a condensate return of 60%, and two turbines. The boiler was being treated with a traditional program based on phosphates/oxygen scavenger. This refinery's ongoing corrosion problem caused unplanned and expensive boiler shut downs. Additionally, the operators were unable to maintain control of the fluctuating pH and high iron levels. These issues, compounded by a dramatic increase in blowdown, were having a large impact on the operating efficiency of the boiler.



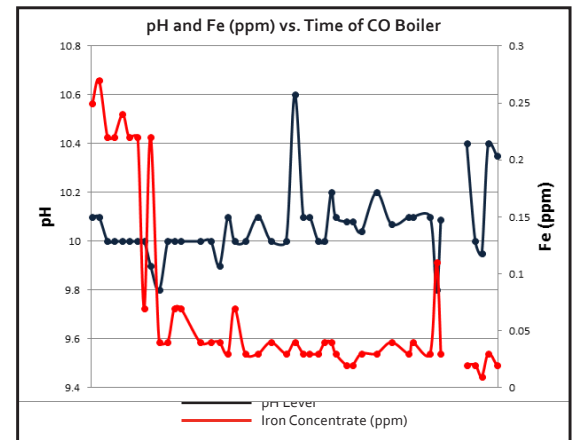
## Solution

This boiler, with a high condensate return of 60% and demineralized water as the makeup was a perfect candidate for TITAN<sub>360</sub><sup>TM</sup>. The superior filming amine in TITAN<sub>360</sub><sup>TM</sup> was also expected to decrease the iron levels and reduce the amount of boiler shut downs. A trial with TITAN<sub>360</sub><sup>TM</sup> was initiated and the following parameters were monitored for four months: pH and iron concentration, blow down volume and leakage volume.

## Results

Within several weeks, TITAN<sub>360</sub><sup>TM</sup> began to dramatically decrease corrosion rates and iron levels. In the CO boiler, the iron concentration dropped 80% from more than 0.25 ppm to less than 0.05 ppm. Additionally, the pH, which had a tendency to fluctuate from 9.8 to 10.1, stabilized to a consistent value above 10. Figure 1 summarizes the iron concentration reduction and pH stabilization during the trial. TITAN<sub>360</sub><sup>TM</sup> also increased the operating efficiency of the boiler, with a blowdown reduction of 75%.

Figure 1: Iron Concentration (ppm) and pH Values of CO Boiler Over Time



## Summary

The implementation of TITAN<sub>360</sub><sup>TM</sup> resulted in less boiler shut downs and increased its boiler efficiency significantly. While the annual water treatment savings annualized to \$238,000, the plant also realized further savings in a reduction of energy and maintenance costs.

