CASE STUDY

TITAN360™ Provides Superior Corrosion Protection

Background

A Northeastern power plant was experiencing difficulty determining the effectiveness of their boiler treatment program. The 225 MW combined cycle power plant only operates at peak times of the year, specifically when electricity demands were high during the hot summers and cold winters. The boiler system consisted of 2 gas turbines, 2 HRSG units, and 2 steam turbines that produced 78 ton/h of steam. Each HRSG had an HP drum that produced 240K#/hr of steam at 1,450 psig.

The condensate return was close to 90% when one unit was online, but dropped to 50-60% with both units online. Intermittent operations posed a challenge for this system, because as the boilers sat idle, they were subject to oxygen attack.

To address this corrosion issue, the plant fed a filming amine treatment to provide additional protection during times of shut down. However, without a means to monitor and control feed, performance of the treatment was difficult to determine without a physical inspection. During one instance of a startup, a level transmitter was plugged up with iron, which indicated that the treatment was not working well.

Solution

TITAN360 was a perfect candidate for this intermittently operating boiler with a high condensate return of 50-60%. The superior filming amine in TITAN360 was expected to provide better corrosion inhibition, which would decrease iron throw during times of startup.

In addition, TITAN360 would offer buffering action to keep the pH of the system consistent. With the TITAN360 test kit, proper dosage could be measured and monitored with ease.

Results

Within a few weeks, TITAN360 began to dramatically decrease iron levels and easily stabilize the pH of the system to 9.0- 9.6 without additional intervention. Additionally, with the simple test kit, the operators were able to consistently maintain and measure a residual. This was a considerable improvement over the previous treatment, which lacked the means of monitoring the proper dosage. The presence of residual or “free” filming amine with TITAN360 indicated there was sufficient protection of the metal surface.efficiency of the boiler, with a blowdown reduction of 75%.

Results are examples only. They are not guaranteed. Actual results may vary.

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Figure 1: Deaerator dome and spray nozzles with water droplet accumulation.

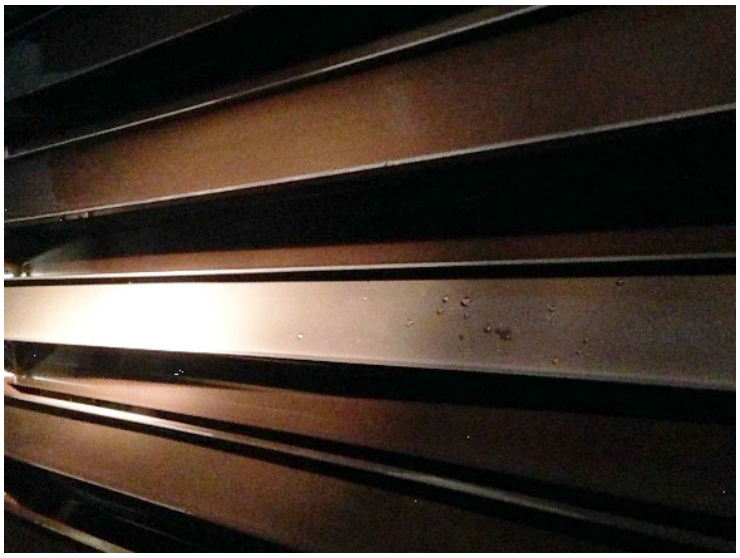

Figure 2: Deaerator trays with non-wetted surface and beaded water droplets

A boiler inspection revealed that TITAN360 formed a protective film in the early sections of the cycle. The most prominent filming was prevalent up through the deaerator. This was evident by the non-wetted metal surfaces and presence of beaded water droplets, which can be seen in Figures 1 and 2. The deaerators had an excellent surface oxide passivation for all visible areas and there was no sign of any active corrosion or flow accelerated corrosion on any surface or internal component.