Ilva Steelworks: Smart investment to ensure continual processes

Reconditioning spiral heat exchangers **Case story**

Alfa Laval spiral heat exchangers help produce the coke at Ilva Steelworks in Taranto, Italy.

Ilva Steelworks is part of the Italian steel corporation the Riva Group, one of the world's largest steel producers with net sales of 9.5 billion euro.

The coastal city of Taranto lies on the inner heel of the Italian boot and is the home of various production facilities for Ilva Steelworks. Here Ilva produces hot- and cold-rolled coils, quarto plates, pipes and pipe coating for the packaging and other industries.

The Taranto Steelworks has Alfa Laval spiral heat exchangers to cool coke gases when producing coke used for steelmaking. The heat exchangers are equipped with titanium plates to handle aggressive media due to the use of seawater as the cooling medium.

After more than 20 years of satisfactory service at Taranto Steelworks, twenty Alfa Laval spiral heat exchangers (SHE) required maintenance service that was long overdue. Ilva asked Alfa Laval to conduct total reconditioning.

Appearances are what initially prompted Ilva's interest in reconditioning the spiral heat exchangers. Due to the plant's proximity to the Taranto Sea, many of the units' outer parts made of carbon steel showed signs of heavy corrosion.

Cost-effective reconditioning expertise

The reconditioning of spiral heat exchangers has proven to be a financially valid decision. The cost of reconditioning has been of about 30% less than purchasing new units.

Scope of work

At the Alfa Laval Service Centers, the spiral heat exchangers underwent general visual inspection of all carbon steel parts, integrity testing to determine the presence of any leakage, high pressure cleaning and chemical cleaning of the titanium plates in specially formulated Alfa Laval chemical solutions, and subsequent repair of internal leakage.

As mentioned, heavy corrosion was visible on the carbon steel covers, flanges, bolts and spiral supports. By employing sandblasting techniques, Alfa Laval was able to restore clean, rust-free surfaces to components that were not severely corroded. Parts that were too badly damaged by corrosion were replaced with new ones, in some cases, using stainless steel rather than carbon steel to enhance corrosion resistance. Existing carbon steel flanges were replaced with titanium flanges according to Alfa Laval's recommendations.

To remove the coke deposits that can build up on heat transfer surfaces, cleaning in place was also employed to restore heat transfer efficiency to as good as new condition. In addition, titanium plates were first cleaned by high-pressure washing and then immersed in specially formulated Alfa Laval chemical baths to restore optimal heat transfer efficiency. Ageing gaskets were also replaced to restore optimal sealing function.

Based on pneumatic tests at 1 bar and pressure tests at design pressures, one heat exchanger showed signs of internal leakage. Alfa Laval pinpointed the leakage and repaired it by welding the faulty area with new material.

The reconditioned carbon steel components were painted and the spiral heat exchangers were re-assembled, packed and shipped to the Taranto Steelworks.

Alfa Laval also reconditioned other manufacturers' spiral heat exchangers as part the Alfa Laval AllBrands program.

With minimal investment, the reconditioned spiral heat exchangers now work like they're brand new. In light of high raw material costs for titanium, reconditioning proved to be a sensible, cost-conscious alternative to buying new spiral heat exchangers.

Detail of a spiral heat exchanger before Alfa Laval reconditioning.

The same Alfa Laval spiral heat exchanger after reconditioning.

How to contact Alfa Laval

Up-to-date Alfa Laval contact details for all countries are always available on our website at www.alfalaval.com