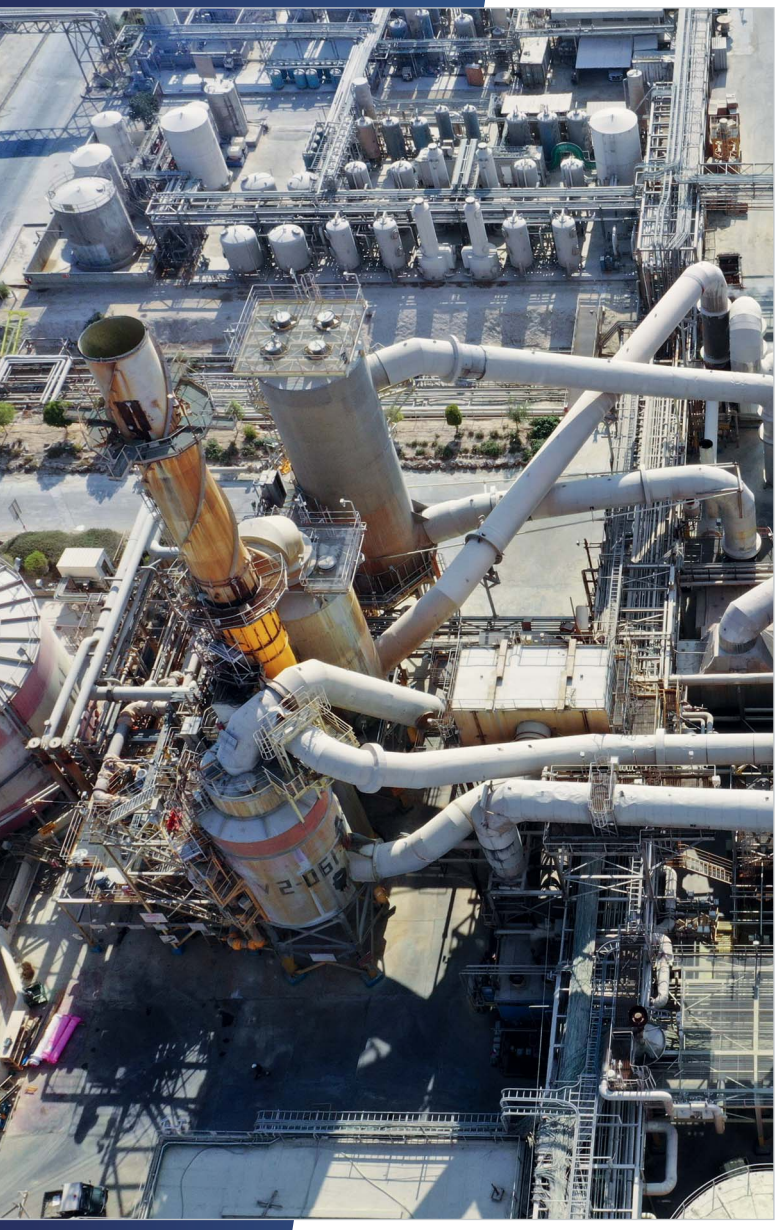
REICON

ICL

CASE STUDY

Enhanced Efficiency and Corrosion Protection in a Fertilizer Manufacturer



CUSTOMER

ICL ROTEM is the largest fertilizer manufacturer in Israel. The production process of sulfuric acid produces a lot of waste heat which is used in several steam production capabilities, utilizing two Heat Recovery Steam Generators (HRSG) and multiple heat exchangers. A considerable steam and condensate system, spanning several kilometers, supports various operations, including turbine operation in a separate closed loop and the provision of process steam for a phosphoric acid plant.

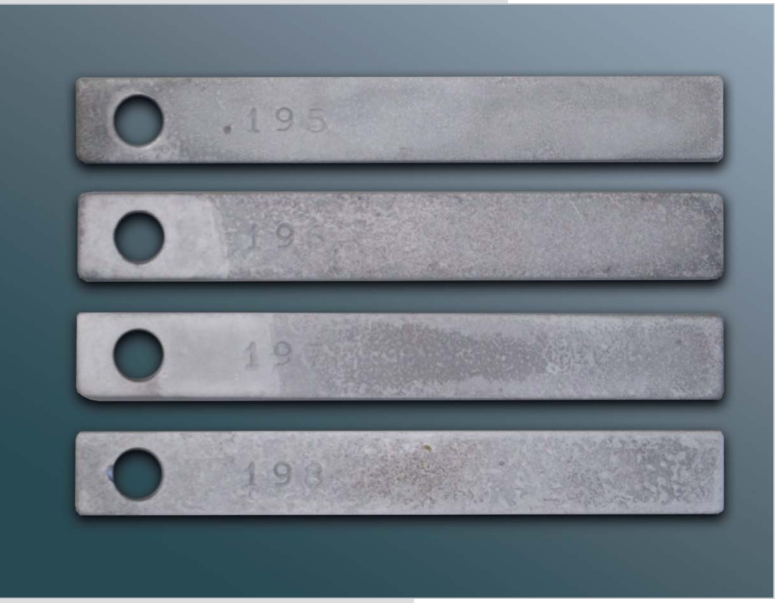
PLANT CHARACTERISTICS

- Steam generation by means of several waste heat boilers from a sulphuric acid plant
- Very large steam and condensate system
- Turbine operation
- Process steam for phosphoric acid production
- Boiler A: 42 bar, 120 t/h,
- Boiler B: 42 bar, 200 t/h,
- Problem: Dips from secondary system (sulphuric acid) due to defective heat exchangers pH drops in condensate but also boiler water Manual dosing of caustic soda solution

SITUATION

The plant faced multiple challenges, including managing several waste heat boilers and tube-type heat exchangers in parallel/series to recover heat from the exothermic process. Additionally, the extensive steam and condensate system posed a logistical challenge due to its vast network of pipes. The use of steam to heat up the process, turbine operation, and occasional leakages in heat exchangers leading to acid

contamination in the steam and condensate were additional concerns. The plant experienced a drop in pH in the condensate and boiler, necessitating manual addition of caustic.
To address these challenges, the plant implemented the injection of ODACON® in addition to the existing morpholine treatment in the feedwater.



Corrosion Coupons

The ODACON® injection was administered steadily and continuously at low concentrations of 0.3 – 0.5 ppm as an active agent. Periodic control of the ODACON® concentration was carried out through grab sampling and photometric analysis. The objective was to achieve improved control of iron concentration in boiler water and condensate.

RESULTS

The application of ODACON® yielded significant improvements in various aspects of the plant's operation:

1. Conductivity in Steam Turbine Loops:

- Before ODACON® injection, the average conductivity in closed steam turbine loops was 5 µS/cm.
- With ODACON® treatment, the average conductivity decreased to 3 µS/cm, indicating improved water quality.

2. Iron Concentration:

- The iron concentration in boiler water decreased from 0.2 ppm to a minimal 0.05 ppm, demonstrating effective control over iron levels.

3. Corrosion Rates:

- Corrosion coupons showed very low corrosion rates, affirming the protective effects of the ODACON® treatment.

4. Protection of Steam and Condensate Lines:

- All steam lines and condensate lines were reported to be very well protected against corrosion.

BENEFITS

- **Reduced Iron Concentration**
- **Protection of Steam & Condensate Lines**
- **Very Low Corrosion Rates**

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