

## CASE STUDY

### Corrosion mitigation and improved turbine protection in Jönköping Energy AB Biomass Power Plant



#### CUSTOMER

##### Jönköping Energy AB – Sweden

A municipal-owned utility company based in Jönköping, Sweden, providing electricity, heating, cooling, and city networks to around 57,000 customers.

#### PLANT CHARACTERISTICS

- biomass power plant
- Steam capacity: 144 t/h
- Valmet boiler,  $T = 540\text{ }^{\circ}\text{C}$ ,  $p = 140\text{ bar}$
- Scope of Application: Peak load operation during winter time

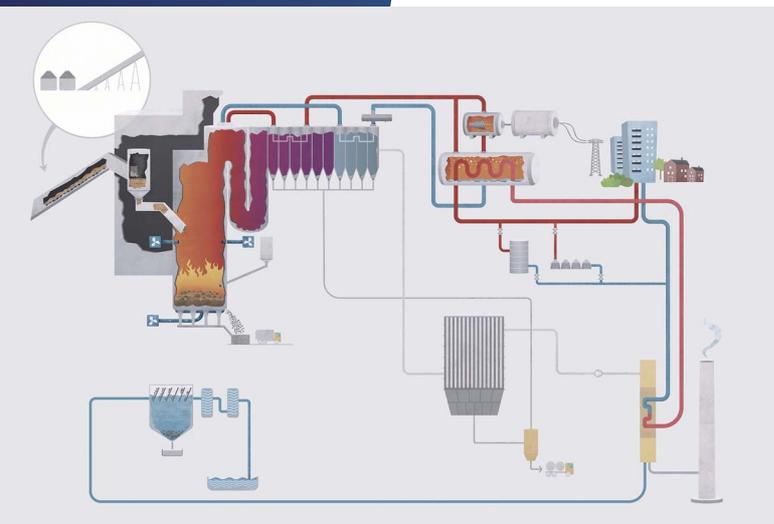
#### SITUATION

The biomass power plant faced challenges related to increased corrosion during commissioning, difficulties in emptying and drying the feedwater tank and corrosion issues in the bottom wet areas.

Flow accelerated corrosion (FAC), and scale formation from boiler water carry-over further complicated the operational conditions.

#### PRESERVATION PROCEDURE

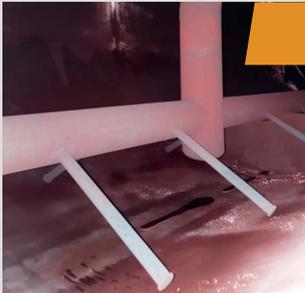
- Injection of FFAP (ODACON®) in the feed water tank.
- Dosing pump connected to start/stop of feedwaterpump in the DCS system.
- Continuous dosing during operation in the winter season with max concentration of 0.3 ppm ODACON® from February until the end of season (3 months).





2016

Corrosion in bottom, wet area, red hematite surface



2018

Increased pH to fight FAC – no changes on feed water tank condition



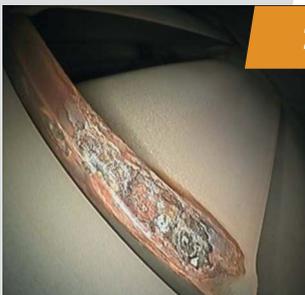
2021

After ODACON® dosing: Grey magnetite layer with hydrophobic character



2018

Corrosion damages, off-line corrosion scale formation



2020

Increased corrosion damage (downtime periods)



2021

After ODACON® dosing: Shining surfaces, no signs of further corrosion, less deposits

**MONITORING**

The application was monitored through an online measurement system, including pH and conductivity measurements after the cation exchanger. Additionally, periodic grab sampling for Film Forming Amine (FFA) analysis was performed.

**RESULTS**

The implementation of the preservation plan yielded significant improvements in the biomass power plant's operational performance and corrosion mitigation.

**1. Feedwater Tank Condition:**

- ODACON® dosing transformed red hematite oxides into grey hydrophobic magnetite layer.
- Improved surface properties offer corrosion protection.
- During summer shutdown, small water droplets observed on tank top disappeared quickly, indicating enhanced drying capabilities and better storage condition.

**2. Turbine Condition:**

- SIEMENS' video endoscopy showed cleaner surfaces with no corrosion signs.
- Flow accelerated corrosion (FAC) and off-line corrosion mitigated, enhancing turbine component longevity.

**3. Deposits Reduction:**

- Preservation plan effectively reduced turbine deposits.
- Prevention of scale formation from boiler carry-over.
- Smoother turbine operation and increased efficiency.



Reduced Iron Concentration



Faster Start Up



Protective Layer Formation

**CONTACT**

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