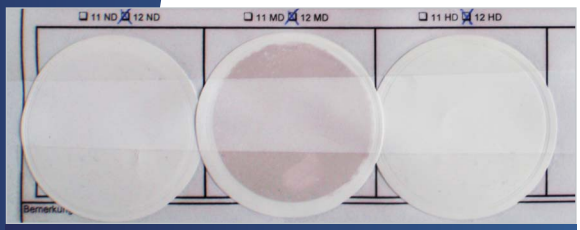
REICON

Statkraft

CASE STUDY

Preservation of the water steam cycle at Statkraft combined cycle power plant



Parameters	Formula	Unit	LP	IP	HP
$Iron_{Total}$	Fe	µg/l	< 20	< 80	< 20
$Iron_{AAS}$	Fe^{2+}/ Fe^{3+}	µg/l	3	29	3

Iron concentration during unit start up before ODACON® application

CUSTOMER

Statkraft Markets, Hürth (Germany)
A leading energy producer operating the Knapsack combined cycle power plant near Cologne, Germany. The plant provides flexible and efficient power generation to support grid stability and energy demand.

PLANT CHARACTERISTICS

- Total power output: 800 MW
  - 2 x gas turbines each 267 MW
  - 1 x steam turbine 270 MW
- Steam capacity: 700 t/h
- 2 x heat recovery steam generator
  - HP: 114 bar, 555 °C, 500 t/h
  - IP: 28 bar, 545 °C, 117 t/h
  - LP: 4.2 bar, 230 °C, 72 t/h
- No condensate polisher
- Application: flexible plant operation, less operation, fast start-up required

SITUATION

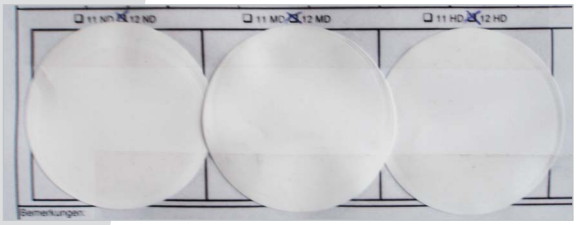
Because of low electricity rates and high prices on gas at the same time, both units had only few operating hours and faced frequent and unpredictable offline periods. To protect the boilers against offline corrosion, they remain filled and get nitrogen blanketing.
The turbine and condenser were dryed by air. Even with these already applied preservation actions the plant faces offline corrosion issues, increased iron levels and clogging of condensate filters during start-up. Since January 2015 the preservation technology with the film forming amine ODACON® was additionally used.

CASE STUDY

REICON

ODACON® dosing in main condenate with high pressure piston pump

Hydrophobic surfaces in condenser



Iron filter during start up with ODACON® dosing

PRESERVATION PROCEDURE

GENERAL REQUIREMENTS

- Commissioning anytime at short call
- Preservation in single steps
- Cycling operation with daily start and stop

DOSING TECHNOLOGY

- ODACON® injection in main condensate after-condensate pump
- Use of a metering pump with max. 24 l/h
- Installation of an injection lance referred to recommendation of REICON

SUPERVISION PROGRAMME

- On-line monitoring of pH-value, conductivity after cation exchanger (CACE) and degased conductivity (DC)
- Periodic measurement of ODACON® concentration in condensate

RESULTS

- Re-commissioning time was reduced about 50 %
- Iron concentration during re-start in IP section reduced by 70 %
- No additional nitrogen injection for short term protection and drying for long term protection necessary

BENEFITS

Reduced Iron Concentration

Faster Start Up

Protective Layer Formation

CONTACT

Phone: +49 341 649 120
Email: info@reicon.de
Web: reicon.de