

Tekniska Verken i Linköping AB

LINKÖPING, SWEDEN – COAL TO BIOMASS FUEL CONVERSION

PROJECT CASE HISTORY



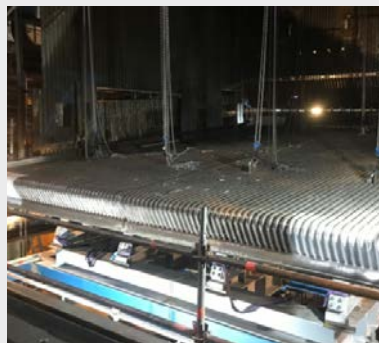
Project description

Boiler 1 at Tekniska Verken in Linköping was built in 1964 and rebuilt in 1985 from oil to coal burning, with a steam capacity of 99.6 t/h. In 2018, the conversion to biomass began with the installation of a new combustion grate. The vibration grate was integrated into the boiler circuit by means of coupling the cooling of the grate to the boiler drum, eliminating the need for other cooling circuits.

The scope of supply included project management, engineering, design, manufacturing, delivery, disassembly, installation, commissioning, testing and documentation for conversion of an existing boiler (Line 1), from coal to biomass combustion (wood chips and waste wood). After the conversion to biomass, the boiler can deliver 93 tons of steam per hour at a steam temperature of 475 °C and pressure at 56 bar.

The flue gas emissions of NO_x and CO₂ was optimized by means of CFD modeling/calculation and optimization of the primary and secondary combustion air systems to meet the authorities' requirements.

Included in the scope of supply was a hanging superheater made of material TP347/ASTM A312. The connection to the headers was made with transition pieces in material 10CrMo9-10 and connection tubes in 13CrMo4-5.



Client: Tekniska Verken i Linköping AB
Year: 2018

Milestones

Contract: 27-06-2018
Start on site: 04-08-2019
Hand over: 11-02-2020

Data

Fuel: Wood chip / waste wood
Steam temperature: 475 °C
Steam pressure: 57 bar

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Inconel® cladding was applied in the bottom of the furnace, at the front, rear and side walls, as well as single tube cladding on tube out-bends for doors, fuel inlet ports and nozzles. A total of approximately 130 m² of Inconel cladding was utilized.

The above mentioned membrane walls, delivered from workshop, were cladded with Inconel 625 (NiCr22Mo9Nb W. nr. 2.4856) in automatic welding towers. All bend outs and connection tubes were cladded with Inconel 625 in a 360° automatic welding machine.

Scope of supply

- New panel walls in the bottom furnace
- Inconel cladding (Inconel 625) of new bottom furnace walls (approx. 130 m²)
- New superheater and sootblowers
- Water-cooled vibration grate
- Steel structure for the grate
- Fuel feeding system (fuel silo, air spouts, etc.)
- Platforms and stairs
- Primary combustion air system
- Secondary and tertiary combustion air systems
- Flue gas recirculation system
- Refractory
- Insulation and cladding
- CFD calculation
- Instrumentation
- Mechanical installation
- Electrical installation
- Commissioning
- Documentation
- Spare parts



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