Case Study

Air Preheater/Gas Gas Heater Upgrade

EDF Thermal Power Plants, France

Extended lifespan for 600MW units with enhanced heater performance, leakage reduction and availability increase

Howden enabled EDF to achieve the ongoing reliable operation of their largest power units by combining indepth technical expertize of rotary heaters and project management. Significant reductions in heater leakage and improved thermal performance were delivered. This was verified by independent ASME based performance tests, agreed with EDF, to measure guaranteed parameters.

Challenge

Facing the need to meet the stringent European mission limit values for coal power plants, EDF committed to the renewal of major equipment within three of their biggest coal-fired units - Le Havre, Cordemais 5 and Cordemais 4. Each unit has a capacity of 600MW.

The objective of the project was to improve the performance of these three units and extend their lifetime up to 2035.

Project Approach

Having been awarded the contract for both the Air Preheater and Gas Gas Heater retrofit, Howden brought together a diverse and experienced team in order to complete the varied and complex tasks within a turnkey structure.

The team consisted of engineers specialized in different areas such as electrical, structural, pipes, thermodynamics, safety, security and project management.

With safety a top priority, the project was developed and undertaken with the safety of our people and those we worked with in mind. Our commitment was reflected in the EFD safety letter with the ‘no accidents objective’ fulfilled.

The technical solution aimed to reduce leakage, improve thermal performance and develop a more efficient and reliable cleaning system. These updates would improve the overall performance of the unit and the cleanability of the heat transfer elements by reducing the pressure drop across the elements.

Solution

Air Preheater

We began the project by looking at how to add value at each stage of the process – conception, engineering, manufacture and erection. The solution incorporated a new SCR-compatible elements profile and configuration, an enhancement to double sealing (48 sectors) with a new complete sealing system and new fixed sector plates (VN sealing system).

Howden also installed hot end and cold end sootblowers to perform effective online high-pressure washing of the elements (image 1), together with the complete design, supply and installation of steam, compressed air, and high-pressure water supply. Additionally we installed a complex fire detection and extinguishing system.

Gas Gas Heater

For the GGH retrofit, we installed a new high-pressure pump, new radial, axial and circumferential seals, new fixed top and bottom sector plates and axial plates. New baskets were also installed with reduced height HC12e profiles (from current 850m to 600m) as well a new rotor.

Execution

Howden collaborated with more than a thousand subcontractors working at the EDF power plant at the same time.

We directly managed over 150 of those subcontractors during the three year period of the project execution, as well as more than 50 Howden experts and welders per unit.

We met and exceeded the stringent quality and safety requirements whilst achieving the agreed deadlines in order to meet the completion date.

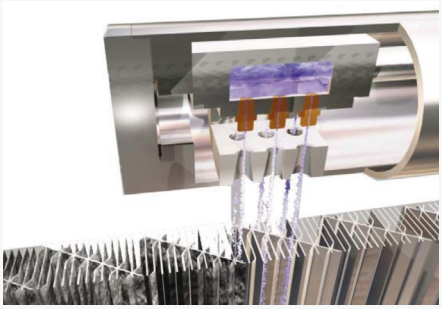

Image 1: online high-pressure washing system

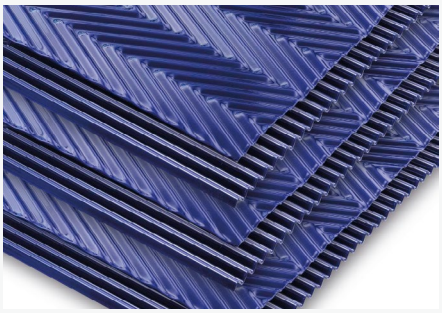

Image 2: HC Element™ profile

Outcome

Air Preheater

Modifications implemented by Howden helped combat the potential of fouling and plugging caused by Ammonium Bisulphate (ABS) as a result of the new SCR installation.

After a year of operation, the APH pressure drop values were below the guaranteed pressure drop, while maintaining the original thermal performance.

This confirmed that the combination of the cleanability of the new layers configuration with the HC Element™ profile (image 2), along with the high efficiency cleaning devices were the most suitable solutions to keep the pressure drop value within the acceptable threshold; the result being assured fan availability.

Howden successfully achieved a leakage reduction of 6.4%, measured one year after commissioning. The upgrade also reduced the maintenance cost and the leakage drift.

Gas Gas Heater

The main objective was to reduce the level of SOx leakage and fouling.

A leakage reduction of less than 1% (measured after one year of operation) was achieved using a non-actuated sealing system for the gas heater. This eliminated all mobile and actuated setup thereby reducing maintenance and leakage drift.

After a year of operation, the GGH presented pressure drop values very close to the recorded pressure after commissioning. This confirmed that the combination of cleanability of the HC Element™ profile plus cleaning power of the new blowers perfectly addressed the plugging tendency in such an aggressive application. Maintaining original thermal performance with profiles that are 250mm lower resulted in significant maintenance savings.

After a successful retrofit, Howden were awarded with a framework agreement with EDF as well as regular consultancy services to ensure the optimum performance of the heaters is maintained.

In both cases, Howden designed and installed all the auxiliary installations necessary for the correct functioning of the equipment, such as hanging structures on the facade of the building, pipes, electrical installations and control systems.

For further information get in touch with our team today:

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