Experience

Howden

Fans and Heat Exchangers

HOWDEN PLAYS A PART IN IMPROVING THE EFFICIENCY AND ENVIRONMENTAL PERFORMANCE AT THE 2400 MW LONGANNET COAL FIRED POWER STATION.

Removal of hot end element baskets.

ScottishPower's Longannet Power Station is situated on the Forth estuary in eastern Scotland. It has a net generating capacity of 2400MW from its four units, which fire a mixture of local and imported coal. As part of its continuous drive to improve efficiency and to meet tightening emissions targets the station has recently completed two projects which have involved Howden equipment.

AIR PREHEATER ENHANCEMENT

Howden supplied the air preheaters when the station was built around 1970. Over the years the sealing system had deteriorated and was permitting an excessive amount of air to leak to the flue gas stream. In addition, combustion conditions were causing deposits to form in the furnace, which were being transported to the air preheater and lodging in the gaps between the elements.

Howden received a contract to modify the heaters with the aim of reducing both fouling and leakage and of increasing plant availability.

In mid-1997 work commenced on the two rotary air preheaters fitted on Unit 1. First, the elements were replaced with a CU profile (which had previously been pilot tested) in which the element corrugations spaced the plates further apart than those of the existing elements. Modifications to the rotor allowed the installation of a greater depth of elements than had originally been fitted. Second, the sootblowers were replaced with fully retractable units, which provided three cleaning options, steam blowing, plus high pressure and low pressure water washing. Third, the sealing was upgraded to the Howden VN system. The unit was commissioned in September 1997, and as part of the contract, leakage and pressure drop were guaranteed for four years.

As a result of the work carried out, air leakage has dropped from around 15% to 6%. The element change has increased the boiler efficiency by 0.7%. Draft fan power has reduced by 80kW. Fouling in the elements has been reduced and water washing has not been necessary (previously it was carried out, off line, approximately twice per year). The successful operation of the air preheater led to a contract to carry out identical modifications on Unit 3, which were carried out early in 1998.

Case Study

HSL C006a
Sept 1999

Fans and Heat Exchangers

Experience

Case Study

Gas recirculation fan being installed on the gas reburn system.

GAS REBURN

ScottishPower, as part of the EU Thermie program, and in conjunction with a number of European partners, has upgraded its combustion technology on unit 1 at Longannet in order to reduce NOx emissions. Gas reburn involves injecting natural gas into the furnace above the main combustion zone to produce a fuel rich region where NOx is reduced. The gas contributes around 20% of the energy released in the furnace. Further downstream, overfire air is introduced in order to complete combustion. Howden has supplied the gas recirculation fan and the two overfire air fans. The centrifugal gas recirculation fan, which is the largest of the three, has an impeller diameter of 3.3m, running at 990RPM.

Howden engineers at site.

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