POWER CASE STUDY - GAS FIRED POWER STATION, UK

Energy savings in the power sector

ABB find £3.5M savings per year at efficient gas fired power station.

The client’s gas fired power station was relatively new and generally considered to be one of the most efficient power stations in the UK.

However, recent operations at the power station had been characterised by a fluctuating output, based on varying demand from the National Grid. This had the effect of reducing the plant efficiency, resulting in increased gas consumption coupled with a reduced output.

The client had heard of ABB’s reputation in energy efficiency, and requested an investigation to help improve energy efficiency, reduce the parasitic load and minimise emissions.

Solution

ABB’s highly skilled energy consultants spent a week on site investigating ways to improve energy efficiency. They identified total savings of 10 - 20% of site parasitic load, equivalent to about £1.8 - 3.5M in savings each year as well as significant reductions in emissions of CO\(_2\).

The savings identified included up to £1M per year through the use of an inlet cooling system, which would cool the gas turbine inlet air allowing an increase in power output as well as an increase in efficiency and, up to half a million pounds per year by optimising gas compressor operation. Further significant savings were found by sealing vacuum leaks and reducing boiler purging during shutdown.

In addition to the above savings, many further measures were found which would lead to a reduced site power consumption and an increased generation efficiency. These included automated boiler blowdown, minimising the use of dew point heaters, increased fuel preheating (with an improvement in pre-heater efficiency), and a reduction in submeter auxiliary loads.
Benefits
- Annual savings of £1.8 - 3.5M per year - equivalent to 10-20% of auxiliary power
- Reduction in CO₂ emissions, and associated taxes
- Improved control of equipment, systems and processes
- Improved monitoring of site operations
- Reduced maintenance requirements