

Case Study

SOLAFT Coal-Fired Power Generation



Excessive filter bag failure in the baghouse

A 720Mw Coal-Fired Power plant in Arkansas USA was experiencing premature failure of their filter bags, which not only posed them emission issues, but also financial implications for replacement bags, lost downtime and maintenance costs.

The plant was sensitive to EPA regulatory requirements, and its emissions control system included selective catalytic reduction (SCR) for nitrogen control, dry flue gas desulphurisation for sulphur dioxide removal, carbon injection system for mercury removal and fabric filtration system in the baghouse for removal of particulates.

The baghouse was designed to house standard 8.5m filter bags, with the expected life of the bags being around 4 years. The coal-fired plant found that 10 to 20% of the filter bags were failing 2 to 3 weeks after installation. Investigation found that premature failure of the standard filter bags was in line with the inlet of the dust collector, and the method of failure was holing between the middle and bottom of the bag.

The company was performing spot changes to deal with the failures to avoid breaches of emission regulations. A secondary issue that compounded the situation further was related to the low 4 m height clearance of the overhead crane on top of the baghouse. When the crane was directly above the relevant cell plate opening, the 8.5m standard filter bags could not be installed, even with two piece cages. The requirement to move the crane during installation was time consuming and placed further stress on the limited plant maintenance resources, and added to the costly downtime.

SOLAFT Filtration Solutions worked closely with the plant's engineering, production and maintenance teams and proposed SOLAFT's StarBags™ as the solution.

StarBags™ have a pleated design, which more than doubles the available fabric filtration area using the same space as traditional filter bags. They are designed to replace existing filter bags, allowing significant increase in baghouse capacity, without changes to the existing cell plate or the cleaning system. They are designed to replace existing filter bags, allowing significant increase in baghouse capacity, without changes to the existing cell plate or the cleaning system. The shorter StarBag™ installed were designed to make sure the bottom of the bag was above the dust inlet, and out of the direct path of the abrasive dust particles.

The extended surface of the bags saw the operation performance of the shorter StarBag™ outperform the previously installed 8.5m standard filter bags in the baghouse. An added benefit of the shortened StarBag™ was that during installation, the overhead crane did not need to be moved, saving time and costs.

This solution is achieved by utilising the advantages of StarBags™ extra surface area to maintain an adequate filtration velocity but also reduce the dust loading being delivered to the filter media through pre separation in the large void created below the bag nest.

Following the successful conversion of a trial cell to StarBags™, the benefits to the coal-fired power company were:

- Operating DP was reduced 30% whilst maintaining gas flow
- Pulse pressure was reduced 50% saving on electricity costs and extending bag life
- Removal of excessive premature failures (10 to 20%) and the need to make spot changes to meet emission regulations
- Eliminated the need to shut down the baghouse to do spot changes for broken bags
- Effective Air-to-Cloth ratio remained unchanged due to the extended surface of the shorter StarBag™

Such were the significant gains achieved through StarBag™, the end user chose to convert the complete Fabric Filter (>16,000 filter bags) to StarBag™ in order to maximise their ongoing savings.

All of these benefits significantly improved uptime and reduced cost across a number of areas, whilst allowing the plant to effectively manage its finite maintenance resources to other critical areas of its operation.

SOLAFT Filtration Solutions has been the driving force working with the first extended surface filter technology, and is recognised as the world leader in this field. StarBags™, patented and launched in 1994, are now recognised and accepted as a superior solution in addressing operating constraints facing many bag houses.

For more information, contact

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