NORAM
Engineering and Constructors Ltd.

Performance Improvement for Electrostatic Precipitators

Skewed Gas Flow Technology is a cost-effective method for reducing particulate emissions in a wide range of electrostatic precipitator applications. Compared to uniform gas flow, reductions in particulate emissions of between 30% and 50% can be expected. Skewed Gas Flow Technology can be easily installed on any dry collection precipitator by modifying the gas flow control devices. Installation can normally be done during an annual outage. Precipitator operating and maintenance costs are not affected.

THE REINTRAINMENT ISSUE

Precipitator design for uniform gas flow assumes there is an even vertical top-to-bottom dust concentration as the gas flow passes through the precipitator. This does not consider the reintrainment of fine particles that takes place as dust falls from the point of collection to the hoppers below.

Figure 1 illustrates the actual distribution of dust in a precipitator when reintrainment of the fine particles is considered. Most of the particulate emissions come from the bottom zone of the precipitator outlet where the dust concentration is higher than at the top.

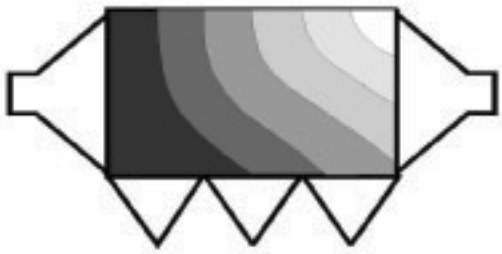
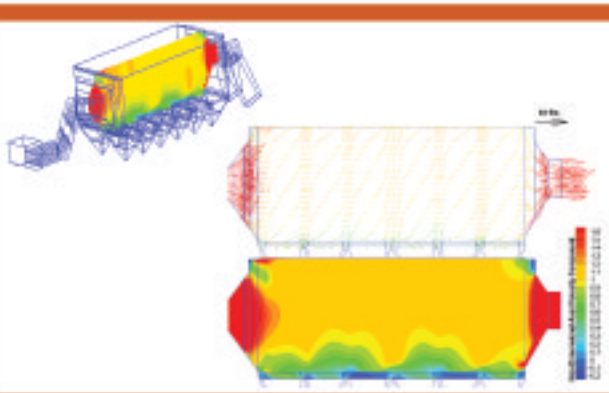


Figure 1. Actual Dust Distribution

ADVANCED ENGINEERING TOOLS

Noram Engineering offers the following services to support performance improvement using Skewed Gas Flow:

- Before and after gas velocity testing
- Development of a CFD model to assist in designing flow modifications
- Engineering and design of the modifications to the inlet/outlet screens to achieve the specified flow profile with minimal change in pressure drop
- Material supply
- Assistance during construction



Baseline CFD Model (Before Modifications)

PERFORMANCE ENHANCEMENT

Precipitator performance is improved by altering the internal gas flow patterns (as shown in Figure 2) to account for the non uniform dust distribution. Skewing the gas flow increases the treatment time in the more heavily loaded regions of the precipitator to improve the overall collection efficiency.

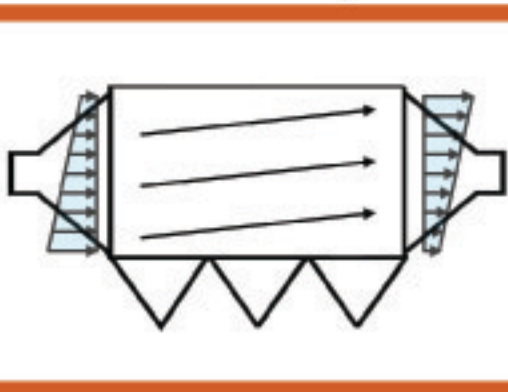


Figure 2. Skewed Gas Flow

PROVEN SUCCESS

With over twenty successful performance modifications to existing precipitators, a reduction in particulate emissions has meant a direct cost savings for many pulp and paper mills and coal-fired power stations.

Skewed Gas Flow Technology enhanced precipitator

Noram Engineering can prepare an estimate of performance improvement by analyzing the basic precipitator configuration and operating data you provide.