AMC POWER
a division of Air Monitor Corporation

APPLICATION BULLETIN
ICA-01

MEASURING PRIMARY AIRFLOW
(Raymond Bowl Mill)

Problem

The objective in the power industry today is twofold; to lower emissions and increase the plant's performance. Precise control of combustion airflow and fuel rates ensures proper stoichiometric ratios yielding more complete, stable combustion which ultimately has a positive effect on emissions and performance.

In coal fired plants, airflow introduced into the pulverizers needs to be measured and controlled continuously. The airflow assists in the transport of the pulverized coal and also makes up part of the air needed for optimizing burner performance.

In the past, accurate measurement of combustion airflow was not obtainable utilizing standard, available instrumentation due to: 1) limited available straight duct runs, 2) low flow rates, 3) high turndown requirements, 4) extreme temperature and heavy particulate environments, and 5) low signal to noise ratios caused by flow pulsation.

Therefore, airflow measuring instrumentation capable of overcoming the above concerns is needed in order to balance the pulverizers and provide the accurate airflow measurementconstituent of the air to fuel ratios.

Solution

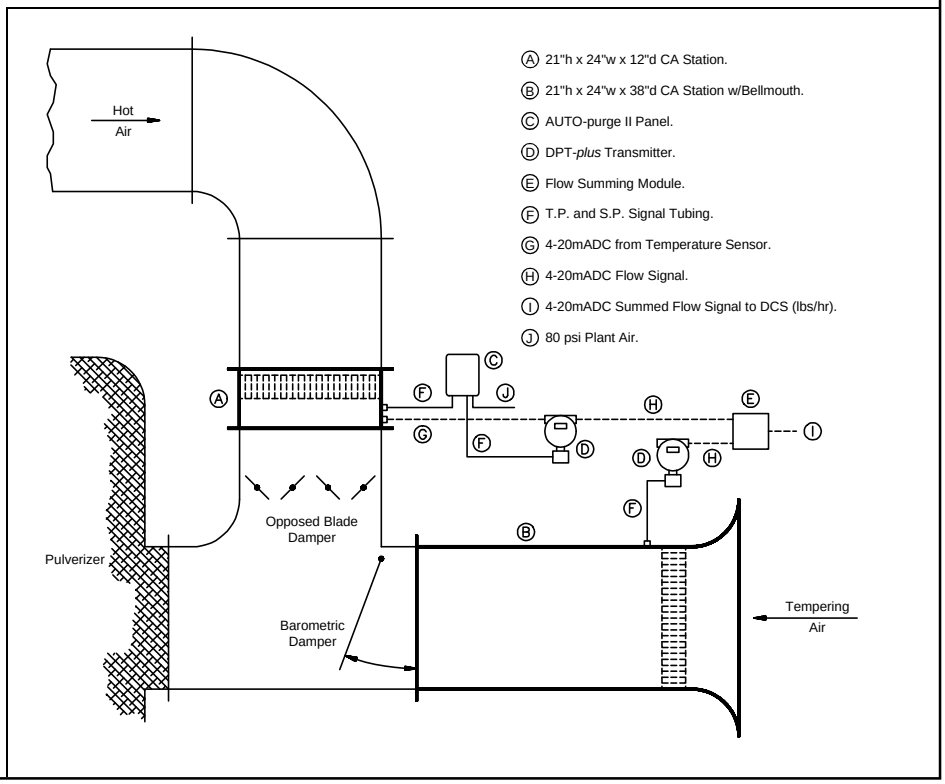
AMC Power's Application Engineering Department was called upon by a Utility in New York State to design a system to accurately measure airflow in the hot air duct and at the entrance of the tempering air inlet leading to a pulverizer (see diagram).

There was no suitable location to install a mixed air flow monitor in the duct section at the entrance of the pulverizer, and the available straight duct run within the hot air duct was limited. Therefore, it was decided to install a Pitot-Fechheimer Combustion Air (CA) Station with flow straightener upstream of the hot air damper. The total and static pressure signals from the CA Station are routed through an AUTO-purge Panel to ensure system integrity despite the flyash present, then on to a DPT-*plus* Ultra Low Span, Density Compensating (DP) Transmitter.

Flow was found to be turbulent and stratified at the tempering air inlet due to the presence of a single blade barometric damper. To obtain an accurate measurement here, an extended length "bellmouth" CA Station was installed. The total and static pressure signals from this CA Station are routed directly to a DPT-*plus* transmitter. The signals from the two transmitters are summed using an AMC Power FACTRON module and the resultant 4-20mADC (lbs/hr) signal forwarded to the DCS for use in controlling the damper actuators.

Results

Once installed, a manual Pitot traverse was performed within the duct work of the 10 pulverizers to verify the accuracy of the AMC Power Combustion Airflow Measuring System. The results proved the system was within 2½% of actual flow. Since this project was commissioned, 90+ systems have been successfully installed within similar applications.



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