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[www.stormeng.com](http://www.stormeng.com)**By: Richard F. Storm and Staff of Storm Technologies, Inc.**

**Want to Optimize Combustion of a Pulverized Coal Fired Boiler?**  
**Begin at the Heart of the Coal Plant,**  
**The COAL PULVERIZERS!**

How obvious, yet often overlooked. The 13 Essentials are about 75% pulverizer and fuel line related. At this date, our experiences at many different plants have been very favorable for improvements in:

- Heat rate
- Slagging
- NO<sub>x</sub>
- Waterwall wastage
- Carbon in Ash
- Fouling
- Burner components reliability
- Boiler tube failures
- De-superheating spray water flows
- Flame stability
- Fuels flexibility
- Support fuel consumption
- Capacity factor
- Opacity

Granted, other factors are important also. Such as air preheater leakage, ductwork air in-leakage, sootblowers and more. The point is, a pre-requisite for excellence in operations and maintenance is to first achieve optimum performance of the pulverizers. Total plant performance improvement requires a comprehensive boiler performance improvement program. Key to a comprehensive program of boiler performance improvement, is optimum pulverizer performance improvement.

Here is a case study of a comprehensive approach as applied to a plant with four MPS-67 pulverizers.

## Field Proven STORM MPS Pulverizer Performance Modifications

Note: The Storm high performance kits have been successfully installed on MPS, Bowl Mills, MBF's, EL's and Ball Tube Mills



First, the primary airflow was measured and controlled for an optimum ramp using a venturi to provide  $\pm 2\%$  accuracy of primary airflow measurement and control.



Second, Classifier changes to utilize “Storm Coarse Particle Guide” design classifier blades.

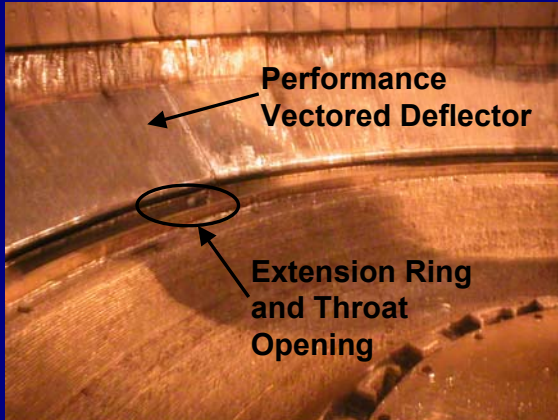
### **Benefits of STORM® Classifier Modifications**

- Reduce +50 Mesh (Coarse particle) bypass.
- Reducing the intensity of “oxidizing” and “reducing” atmospheres within the furnace cavity.
- Installation of STORM classifier blades will create improved swirl, homogenization and fuel distribution. (These must be properly designed and tuned upon installation. Also, the primary airflow ramp and throat configuration must be compatible).



Third, Install Storm Rotating Throat and Performance Vectored Throat Deflectors.

## STORM Deflector Installed



The combination of Storm field service personnel to technically direct the work, Storm home office engineering and manufacturing, and a great partnership of mutually shared values of performance, created excellent RESULTS.

What are the Results? Here they are:

	<u>BEFORE</u>	<u>AFTER</u>
% on 50 mesh	0.02%	0.03%
% passing 200 mesh	70.6%	77%
% Fuel flow imbalance	22%	3.7%
Coal rejects	excessive	> 10 #/hour
Primary air/fuel ratio	2.1 #/#	1.8 #/#

Little subtle details are often the reason for success or failure. Most of the readers of this newsletter know about the importance of fuel fineness in pulverized coal fueled plants. Most of you also know about the importance of equal fuel distribution. The reduced primary airflow, repeatable “ramp” operation, and improved fineness was related to an improvement of the fuel distribution from 22% to 3.7%. This is a small detail. But, a large factor related to CO, unburned carbon, spray flows and other factors.

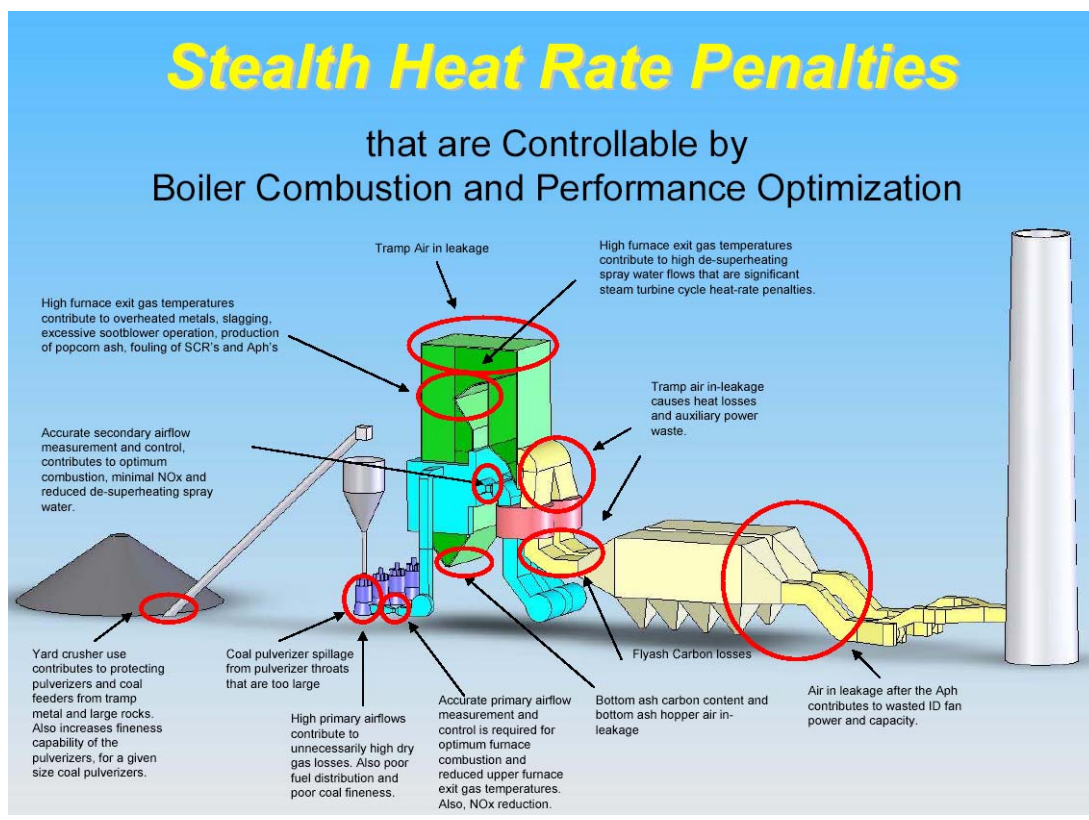
## **SUMMARY**

Yes, we strongly recommend our approach to pulverizer performance optimization. We also strongly recommend a total comprehensive approach to combustion optimization. Including all components, from the F.D. fans and coal yard crushers, to the I.D. fan inlets.

Storm Technologies, Inc. is a Results Oriented Company, and we take great pride in applying Results Oriented Solutions. Let us know if you would like to apply our cost effective solutions!

Yours Truly,

Richard F. Storm  
President



## FEATURED EQUIPMENT



### Forward/Reverse Velocity Tube

Can be used to determine the amount of airflow and velocities in a duct. The probe can be used for many applications, such as: 1) Measuring and balancing Secondary airflow to wind box & burners, 2) Measuring primary airflow to each pulverizers, 3) Calibrating airflow measuring devices such as airfoil, venturi, or flow nozzles, or 4) I.D. and F.D. Fan testing.

Velocity tube sizes vary, so please call for pricing.

### Isokinetic Coal Sampling Kit

Includes:

Stainless steel coal sampler w/filter canister, cyclone separator, Orifice Aspirator Assembly, H.D.P. Sample Container with O ring, Extra Filter Paper, 10ft section of reinforced tubing w/clamps, 1) coal sampling probe, 10 calibrated dirty air probe, 1) temperature and static probe w/ type "K" thermocouple, 2) dustless connectors, digital manometer, 10" vertical incline manometer w/18" pitot tube and steel carrying case, 1 lot of required heavy wall 3/16" tubing, 1) 8 ft type "K" thermocouple lead wire with connections, labels and spare seals.

Call for pricing.



How can you determine the carbon content (L.O.I.) of the flyash? A flyash sampler provides the means to draw ash samples from the flue gas.

### Insitu Flyash Sampler includes:

Sample canister, nozzle tip, perforated cylinder, 100 Reg. filter paper, aspirator assembly, optional pipe length, required air connection fitting and procedures. Call for pricing.



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