

SUCCESS STORIES

HOOSIER ENERGY, MEROM, UNIT #1 PF-DISTRIBUTOR™

MILL TYPE: RILEY, BALL TUBE MILL

LOCATION INDIANA, U.S.A.
UNIT OEM/SIZE RILEY - 500MW
FUEL EASTERN BITUMINOUS COAL

PROJECT OVERVIEW

Hoosier Energy, Merom station recently upgraded their Riley Ball Tube Mill (BTM) system with Riley Model 80 classifiers that incorporated the recently patented PF-Distributor™. After 35 years operating the original 1978 classifiers it was time to replace and incorporate new technology to provide greater flexibility than they had with the older vintage classifiers. Coal fineness, UBC and coal mal-distribution are addressed with the new Model 80 classifier & PF-Distributor™. The focus of this project overview is the performance of Riley's new PF-Distributor™ to address an industry wide problem of coal mal-distribution.



RILEY POWER SOLUTION

Model 80 classifiers with the patented PF-Distributor™ to improve coal fineness and distribution. The Model 80 classifier is designed to improve coal fineness and the PF-Distributor™ to improve coal distribution. The scope included 6 new classifiers for the 3 BTM systems on Merom unit #1.

Mill	Class	% Dist B-4	Mill Basis	% Dist After	Mill Basis
A	A1	+/- 2.4 /7.2	+/- 2.2/4.6	+/- 2.4/7.2	+/- 1.9/1.9
	A2	+/- 1.9/1.9		+/- 1.9/1.9	
B	B1	+/- 3.8/3.8	+/- 2.2/2.5	+/- 3.8/3.8	+/- 2.2/2.5
	B2	+/- 0.6/1.2		+/- 0.6/1.2	
C	C1	+/- 2.8/8.7	+/- 3.4/6.4	+/- 0.8/0.8	+/- 2.4/2.4
	C2	+/- 4.0/4.0		+/- 4.0/4.0	

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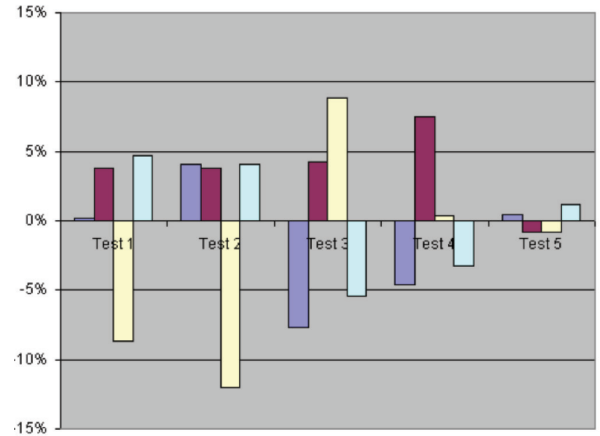
PERFORMANCE RESULTS

Testing was done by ASME/Riley coal fineness test procedure to measure coal distribution in each coal pipe before and after each adjustment of the PF-Distributor™. The baseline coal balance for A & B mills was very good without any adjustment. Several adjustments were made to the A & B mill and distribution was not improved significantly so the PF-Distributors were returned to their zero positions. The C1 classifier showed the most significant imbalance at the zero setting and through a series of tests and adjustments there was significant improvement in the coal distribution as shown in table 1 (on front) and graph 1. The use of standard fineness test methods required additional manpower and time to complete the required than the anticipated use of Riley’s portable Pf-FLO III system. Due to outage constraints there was not adequate time to install the necessary test connections to allow for the Pf-FLO testing. It is anticipated that this testing will be done at a later date to demonstrate the Pf-FLO system.

INDUSTRY PROBLEM

Coal mal-distribution is a common problem that occurs with any type coal pulverizer system. Mal-distribution of coal in the ± 30% range is not uncommon. This occurs despite having well balanced clean airflow in the coal pipes. The fuel imbalance between burners produces a wide variation in primary air/coal ratio and heat input across the furnace. These fuel imbalances are responsible for problems such as high CO, high UBC, excessive slagging/fouling, excessive and unbalanced tube metal temperatures and attemperator flows.

Mal-distribution of coal is generally addressed by changing pipe to pipe airflow using fixed or adjustable orifices. However, this method has limited success in balancing coal flow and often restricts primary flow to the point where coal layout occurs in the piping and burners. Balancing primary air distribution will balance coal distribution to the extent that it was caused by the primary air imbalance. If the coal imbalance is the result of mal-distribution in the mill or classifier the coal pipe orificing will not be effective and continuing to adjust coal pipe orifices to correct a mill/classifier imbalance will result in too much restriction of primary airflow in some pipes, which causes coal layout and fires in the pipes or burners. So, while orifices can be effective at balancing coal pipe mal-distribution they are not the final solution to achieving balanced coal distribution.



^ Graph 1 - C Mill, C1 Classifier Coal Balancing

