

COLLOQUIUM

4:00 P.M.

MARCH 1, 2007

LYTLE HALL 214

*Combining Statistics and Mathematical Programming to
Develop Coal Blends for Optimum Cokemaking and Blast
Furnace Operation*

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ABSTRACT

An important problem at an integrated steel producing plant is the blending of different types of coals to make coke for the blast furnace operation. Historically linear blending models were not appropriate because coal properties important for both optimum cokemaking and blast furnace operation do not combine linearly and are not completely understood. In this talk, a two-step methodology is developed to overcome these classical modeling problems. First, binary decision trees are used to determine what relationships are necessary in the component coals to ensure successful cokemaking and blast furnace operations based on data from a pilot-scale test oven facility. Second, these relationships are then incorporated into a mixed integer linear programming model for blending coals used to produce coke of high quality and low cost for the blast furnace. Finally, the model results are utilized at the pilot-scale oven for testing and validating the new, improved blend(s) that have been dictated by changing availabilities in the coal sources. These steps reduced costs by both minimizing the number of blends to be tested at the pilot-scale facility and ensuring a minimum cost coal blend that is useable for the final operating facilities. Hypothetical, but realistic data are used to illustrate how the models perform together.

3:30 p.m.
refreshments served