



Influence of Inlet Conditions and Burner Tripping on NO and Temperature Characteristics in a Tangentially Fired Furnace

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Abstract: Tangentially-fired furnaces have been used successfully and extensively throughout the world with many types of oils, gas and coal as fuels and are widely used in steam generators of thermal power plants. The present study provides the NO and temperature distributions in the combustion chamber and in the exhaust gas at various operating conditions of excess air factor with varying the air mass flow rate, combustion air temperature and the number of tripped burners. In particular, the simulation provided correlations for NO concentration and each of the maximum furnace temperature and furnace average temperatures. The results show that the temperature distributions are significantly distorted by tripping any of the burners. The results also show that tripping one or two burners either adjacent or opposite or tripping four burners results in regions of high temperature gases close to the walls. The results have shown that the furnace average temperature and NO concentration decrease as the excess air factor increases for a given air mass flow rate. As the combustion air temperature increases, furnace temperature increases and the thermal NO concentration increases sharply. Heat absorptions in super heater and economizer are greatly influenced by combustion air temperature and excess air factor and are slightly influenced by burner tripping. Correlations were obtained for the influence of the combustion air temperature and air to fuel ratio on NO maximum values and NO values at outlet section.

Key words: *Tangentially fired furnace; Burner Tripping; NO Characteristics; Temperature Characteristics*

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