

Study on NO_x Emission Characteristics of Internal Gas Recirculation Technique

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Abstract : This study is aimed to develop ultra-low NO_x burner using the internal recirculation of flue gas inside the combustion chamber that utilizes the momentum of intake fuel and air. Detailed experimental investigations are carried out to study these fluid dynamic effects on the emission characteristics of newly developed burner in industrial steam boiler system. Experimental parameters are distance of Venturi tube from burner, Coanda nozzle gap distance, and air sleeve length at various fuel/air ratio and thermal heat load conditions. The results showed that NO_x concentration decreases as the distance of Venturi tube from burner increases. The CO concentration values at all operating conditions were negligible. In addition, the increase of the Coanda nozzle gap distance decreased the NO_x concentration. It is experimentally found out that both fuel injection recirculation and air injection recirculation technique was very effective in reducing NO_x formation.

Keywords : Coanda effect, combustion, burner, low NO_x

Conference Title : ICESET 2017 : International Conference on Energy Systems Engineering and Technology

Conference Location : San Diego, United States

Conference Dates : December 18-19, 2017