Improvement of Combustion Stability of a Fluidized Bed Boiler for Solid Refuse Fuel

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Recently, there is increasing demand to improve the waste solid fuel combustion technologies that are capable of producing heat and electric energy to mitigate the greenhouse gas emissions and global warming. In particular, there is a need to develop the circulating fluidized bed boiler that can be flexibly applied to fuel diversification needs, since the use of waste solid fuel (SRF, Bio-SRF) is gradually increasing in fluidized bed installations using conventional fossil fuels such as coal. However, the solid fuel contains a variety of minerals such as alkali metal (Na, K), alkaline earth metal (Mg, Ca), sulfur (S) and halogen (Cl), and those is attached to the heat exchange tube in the convection pass in the form of a deposit or clinker which lowers the heat exchange efficiency and causes high temperature corrosion. In this study, we have developed the core technologies that can solve various combustion failure phenomena raised in the commercial scale combustion process. In order to provide stable air flow during steady-state operation and to remove the bottom ash, the design technology of air distributor was developed and effects of chemical additives on the boiler efficiency and characteristics of ash formation were investigated.

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