LOW QUALITY COALS UTILIZATION – KEY COMMERCIAL, ENVIRONMENTAL AND PLANT EFFICIENCY CONSIDERATION

Saqib Nasir

Pakistan Science Foundation, Ministry of Science and Technology, 1- Constitution Avenue, G-5/2, Islamabad - Pakistan

Abstract

Coal blending process is practiced for combustion and gasification, particularly in coal-fired power generation. The Coal blending techniques go a long way in reducing the cost of power generation. The low-grade coals abundantly available in Pakistan can be mixed with high grade coal while retaining thermal performance of the boiler. Generally, any two coals can't just be blended. Successful blending occurs with respect to non-additive properties (likes combustion reactivity of coal, ash characteristics, grindability index, and swelling characteristics) of two coals.

Presently, coal utilization industries (cement, power generation, steel) are using single type coal which ultimately enhance fuel cost hence coal blending is strongly recommend to reduce overall plant cost and to sustain efficiency keeping in view environmental constraints.

Taking an environment-friendly approach in thermal power plants with coal blending requires an understanding of the interaction of inorganic components of coals in the blend process and how it affects ash behavior including its emissivity, and thermal conductivity. Conventional and advanced analytical techniques were used for characterization. Fuel ratio, burnout profile, ash chemistry and carbon burnout are key factors. This work will assist\ utilities to decide on the choice of coals for blending. Combustion efficiency and carbon loss of blended coal, other aspects of slagging, fouling and emission characteristics like NO_x, SO_x and emission of particulate matter are to be studied. Optimisation in process helps in ensuring cost effective and environment-friendly power generation in coal-fired thermal plants. The strict quality parameter monitoring for fuel (coal) recommended to reduce operational & maintaince (OM) cost of project and to use latest off-line and on-line (ash gauges) devices to control blending process.

The technical paper highlight the significance of coal raw mix and various blending methods such as blending in bed, blending by silo, blending by ground hopper and blending on moving belt economical viable for commercial applications. Among them, the most common is the blending on moving belt which is used for all coal processing industries.

Keywords: Coal Blending, Combustion, plant efficiency, environment