A COMPREHENSIVE STUDY OF BITUMINOUS COAL TO THE COAL FINENESS PERFORMANCE AT THERMAL COAL PLANT

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Bituminous coal remains the predominant fuel in pulverized coal–fired (PC) thermal power plants due to its favourable balance of calorific value, grindability, and combustion properties. Among the critical parameters influencing plant efficiency, coal fineness plays a decisive role in determining combustion stability, boiler heat rate, and emission performance. This literature review examines the relationship between the characteristics of bituminous coal particularly calorific value, volatile matter, and Hardgrove Grindability Index (HGI) and the degree of coal fineness achieved in pulverizers. Studies consistently highlight that maintaining at least 70% of coal particles below 200 mesh (75 μm) significantly reduces unburnt carbon, enhances thermal efficiency, and minimizes pollutant formation. High calorific value coals with lower HGI require greater milling energy and finer grinding to ensure complete combustion, whereas low calorific value coals, though easier to pulverize, often pose challenges related to moisture content and drying capacity. Optimization strategies such as classifier tuning, dynamic classifiers, coal blending, and real-time monitoring systems are increasingly employed to achieve desired fineness under varying coal qualities. Overall, the findings affirm that coal fineness is a critical determinant of thermal plant performance, with direct implications for fuel efficiency, operational reliability, and environmental compliance.

Keywords: Bituminous Coal, Coal Fineness, Pulveriser, Thermal Plant