

Coal Preparation Plant: Technology Overview and New Adaptations

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Abstract : A coal preparation plant typically operates with multiple beneficiation circuits to process individual size fractions of coal obtained from mine so that the targeted overall plant efficiency in terms of yield and ash is achieved. Conventional coal beneficiation plant in India or overseas operates generally in two methods of processing; coarse beneficiation with treatment in dense medium cyclones or in baths and fines beneficiation with treatment in flotation cell. This paper seeks to address the proven application of intermediate circuit along with coarse and fines circuit in Jamadoba New Coal Preparation Plant of capacity 2 Mt/y to treat -0.5 mm+0.25 mm size particles in reflux classifier. Previously this size of particles was treated directly in Flotation cell which had operational and metallurgical limitations which will be discussed in brief in this paper. The paper also details test work results performed on the representative samples of TSL coal washeries to determine the top size of intermediate and fines circuit and discusses about the overlapping process of intermediate circuit and how it is process wise suitable to beneficiate misplaced particles from coarse circuit and fines circuit. This paper also compares the separation efficiency (E_p) of various intermediate circuit process equipment and tries to validate the use of reflux classifier over fine coal DMC or spirals. An overview of Modern coal preparation plant treating Indian coal especially Washery Grade IV coal with reference to Jamadoba New Coal Preparation Plant which was commissioned in 2018 with basis of selection of equipment and plant profile, application of reflux classifier in intermediate circuit and process design criteria is also outlined in this paper.

Keywords : intermediate circuit, overlapping process, reflux classifier

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