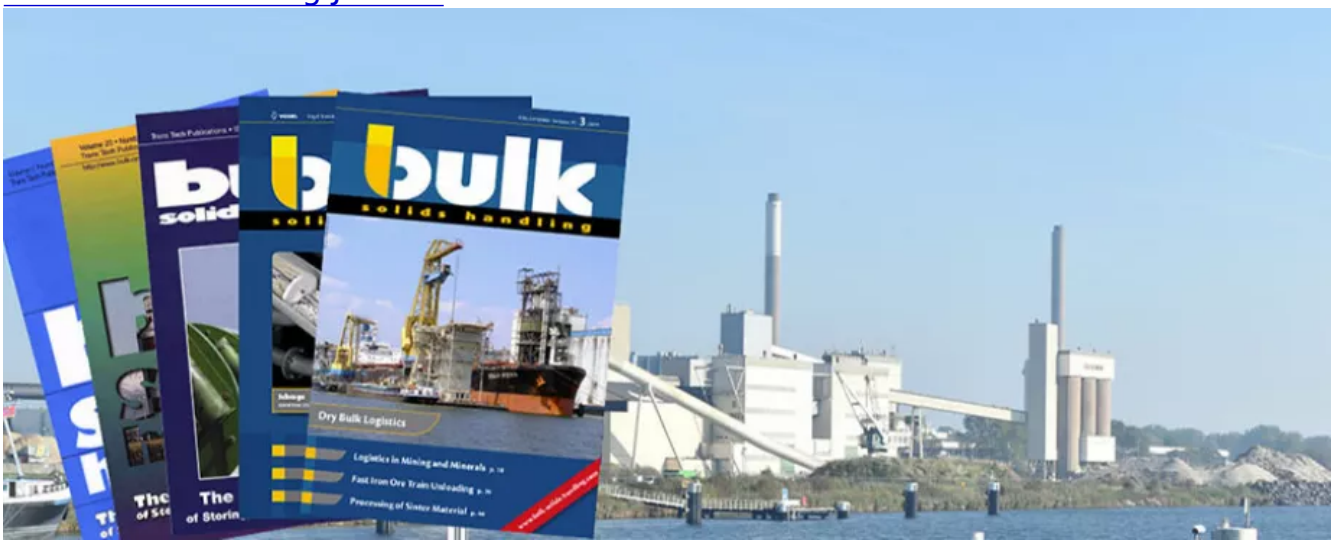
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Technical Article

Steep Angle Conveying of Coal Refuse

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Since the start-up of a Bethlehem Mines Corporation coal preparation plant in Van West Virginia six years ago the refuse handling system proved to be a costly maintenance problem and a material handling bottleneck. To alleviate these problems, the original system, consisting of two screw conveyors and a drag conveyor, was replaced by two steep angle pocket belt conveyors. Within six months the system paid for itself in maintenance savings alone. The following analysis describes the steps leading up to the changeover and reviews its first year operating performance.

The Van facility is a heavy media plant operated by the Kayford, Boone and Nicholas Division of Bethlehem Mines Corporation. It is designed to handle 127 mm x 0 raw metallurgical quality coal from the Powellton seam at a maximum feed rate of 590t/h (metric tons per hour}. Average clean coal recovery rate is between 50 and 65 %. The plant uses three types of cleaning circuits: coarse material (127 mm x 12 mm) is cleaned in heavy media baths; intermediate size material (12 mm x 0.55 mm) is cleaned in heavy media cyclones; and fine coal (0.5 mm x 0) is cleaned in a hydrocyclone/froth flotation circuit.

During 1979 and 1980 the plant processed 2.38 million metric tons of raw coal to produce 1.32 million clean tons or 0.66 million clean tons annually. With a 55 % recovery rate, it is necessary for the plant to handle 0.53 million tons of refuse

annually. Of this quantity 93 % was generated by the coarse and intermediate size cleaning circuits. The remaining 7 % was generated by the fine coal circuit and handled in a separate system which is not discussed here. The typical split between coarse and intermediate size refuse is 60/40, or an annual average of 296,000 tons of coarse refuse and 197,000 tons of intermediate.

During this two year period, the Van facility operated approximately 2,400 hours annually. This resulted in an average output of 123 t/h of coarse refuse and 82 t/h of intermediate size refuse. The refuse handling system was under an average load of 205t/h of material sized 127 mm x 0.5 mm.