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SOLIDS PARTITIONING IN SCREENBOWL CENTRIFUGES

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ABSTRACT

Screenbowl centrifuges have been the primary fines dewatering device at the Curragh Coal Preparation Plant (CPP) in Central Queensland, Australia, since it was commissioned in 1983. Screenbowl centrifuges have been widely used on a variety of raw coal, clean coal, classified and unclassified feed consistencies throughout the coal industry in Australia and overseas since their initial development in the mid-1960s. At Curragh they have predominantly accepted the classified flotation product with the concentrate stream being rejected to tailings. As part of the investigations into an upgrade to the fine coal circuit, the retention of the existing screenbowl centrifuges as the primary dewatering device was evaluated. To enable the development of an accurate mass by size model of the existing screenbowl circuit, in conjunction with other dewatering options, unit performance and solids partitioning information was required. The upgraded dewatering circuit is to treat the concentrate from a new flotation technology circuit. As the new proposed circuit would beneficiate the full 'by zero' size fraction in the upgraded fines circuit, a knowledge of the effectiveness of the screenbowls on the finer size ranges (ie: <0.063mm) was imperative.

The literature reviewed contained some useful information on performance trends with key operating variables (Gallagher et al, 1981). In-house plant samples and other literature (Gallagher et al, 1981; High, 1977) indicate that the majority of solids <0.040mm are found in the concentrate, however no useful solids partition data, suitable for generation of a mass by size fines circuit dewatering model, was found. It was decided that the required data would be generated 'in-house' using the existing screenbowl circuit (6 of 3300x1100 Decanter units) and a series of modified feed conditions. This paper describes this testing program and its outcomes, as well as the impact the test work had on the new fines dewatering circuit design outcomes.

Reference:

Meyers, A., Wex, T., & Leach, K. (2002). Solids Partitioning in Screenbowl Centrifuges. In B. Firth (Ed.), *Proceedings of the Ninth Australian Coal Preparation Conference* (pp. 209-221). Yeppoon: ACPS.