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turn accelerates the upward flow of the aerated slurry.

The design utilizes existing energy provided by the shaft and features reversibility of the impeller blades, says Mr Bourke. When reversing the direction of rotor rotation, there is no need to re-install a new agitator, as the blade pitch changes automatically.

Mr Bourke explains that the technology built into the Macraes TankCells® represents a significant development for flotation technology in general.

“Designed to meet ever-increasing demand for greater capacity on-site,

the 300m³ plus capacity means that TankCell® -300 can cope with a site’s most demanding throughput, still deliver optimum concentrate grade and recovery level. Not only do we have the largest float cell in the marketplace, but recent innovations such as FloatForce™ and FlowBooster, suitable across a wide range of sizes and applications, help raise the bar in flotation technology innovations.”

The three TankCell® -300s at Macraes follow previous proven solutions from Outotec installed over many years. Previous solutions included the company’s flotation, thickening

and automation technology, such as two TankCell® -150s, two SkimAir™ SK500 units for Flash Flotation™ duties, an on-stream XRF analyser Courier 30AP, a PSI 200 for particle size analysis and four SUPAFLO® thickeners.

Outotec, formerly *Outokumpu Technology*, is a worldwide leader in minerals and metals processing technologies, providing innovative environmentally sound solutions for a wide variety of customer needs in the iron and steel, aluminum and non-ferrous metals industries. The Outotec share is listed on the Helsinki Stock Exchange. ■

Jameson Cell Update in Coal and Base Metal Applications

by Brenton Burford, Senior IP Coordinator, Xstrata Technology

Jameson Cells have recently been installed and commissioned in a number of coal and base metal applications.

In coal, Jameson Cells have been installed and commissioned in new plants at Foxleigh, Carborough Downs and Isaac Plains, as well as plant upgrades at Camberwell and Jellinbah. Existing Coal Handling Preparation Plants (CHPP) at Hail Creek and Newlands, have also added more Jameson Cells to their existing installations. All these installations use the B6000/20 Jameson Cell, a 6m diameter cell, with 20 downcomers which can handle up to 1800m³/hr (including recycle—depending on coal type). A smaller Jameson Cell, the B5000/16, will also be installed in the Moorvale CHPP expansion, to complement the existing Jameson Cell already at this site.

All the cells come fitted with stainless steel wash water rings, which allow washwater to be operated either in-froth, or above froth, depending on the level of entrainment present and



The newly installed B5400/18 Jameson Cell used for Prefloat Concentrate Cleaning at Red Dog Mine, Alaska

the solids content of the desired concentrate (in-froth washing tends to produce a drier froth due to better froth drainage). It is important to wash and remove any entrained non-coal particles from the froth concentrate, particularly if low ash levels are required. The other advantage of

adding wash water is that it improves the mobility of the froth, allowing the concentrate to discharge more easily into the launder.

Another major advantage of Jameson Cells is that they do not require any blowers or compressors for air in the

flotation process, so are ideal for retrofitting into existing plants where air supply may be a limitation. In Jameson Cells, air is naturally induced by the shearing action of a plunging jet of slurry created by forcing the slurry through a slurry lens. The slurry lens is mounted at the top of a cylindrical column called a downcomer. In the downcomer, a high shear environment is created which is ideal for bubble-particle attachment and therefore coal recovery. The cell has no moving parts which mean they have less maintenance and require minimal parts replacement, with the slurry lens requiring replacement every two to five years in normal operation in a coal application.

As well as new installations, there has also been a number of older style Jameson Cells that have been recently upgraded, involving the replacement of older style downcomers with the current Mark III downcomers. This allows higher flow rates to be treated by the Jameson Cell for minimal capital outlay, and also improves operational performance and maintenance. Retrofits have taken place at the Stratford minesite in NSW, while the cells at Oaky Creek were refitted with new downcomers along with new distributors and an in-froth washwater system.

In non coal and base metal applications, there have been a number of recently commissioned projects. In one application, a Jameson Cell has been installed for the Mengertswasserji Project in Holland, treating conveyor spillage. A J4500/12 Jameson Cell

was installed to separate iron ore from coal spillage at the Rotterdam Port, one of the largest ports in the world, which handles both coal and iron ore. The duty was to remove coal by flotation in order to produce a clean iron rich product in the tailings. The cell was successfully commissioned in March 2007.

In base metals, the Jameson Cell is finding applications in circuits traditionally using only conventional flotation cells. These "hybrid" circuits have the advantages of both technologies in the circuit, where the fast floating particles are collected by the Jameson Cell at the head of the circuit, while the Jameson cell "tailings" can be treated with conventional cells targeting the slower floating material, which often require long residence times to be recovered. In Jameson Cells which are used for scalping and cleaning duties, the fast floating particles are the valuable minerals, while in a prefloat or pre-float cleaning duty, the fast floating particles are the gangue minerals. Whatever the duty, the robustness and small footprint of the Jameson Cell makes it easy to integrate in existing plants, especially when no blowers, compressors or associated air pipe work are required.

The newly installed E2532/6 Jameson Cell at Consolidated Murchison, in South Africa, is one such hybrid circuit, where the Jameson Cell at the head of the circuit is a rougher scalper. This cell produces a very high grade antimony/gold concentrate of up to 40% antimony, from a head grade of 1

to 2% antimony. Antimony recovery can be up to 40%. The tailings from the cell report back to the conventional flotation cells to target the slower floating antimony/gold particles.

The B5400/18 Jameson Cell at Teck Cominco's Red Dog circuit in Alaska is a prefloat cleaning cell. Preflotation rougher concentrate from a conventional rougher circuit contains a significant quantity of entrained zinc and lead, as well as naturally floating carbonaceous gangue. The Jameson Cell treats the prefloat rougher concentrate with the aim of washing out the entrained zinc and lead while recovering the naturally floating carbonaceous gangue particles to concentrate. The concentrate from the Jameson Cell is discarded to final tailing while the tailing from the Jameson Cell, containing the recovered zinc and lead, is returned to the head of the prefloat circuit. The returned zinc and lead is then available for recovery in the downstream flotation circuit. The cell is fitted with a wash water tray to assist in washing out the entrained zinc and lead minerals from the naturally floating carbonaceous concentrate, and the cell is fitted with internal and cross launders to ensure there is sufficient lip length to handle feed with a high carbonaceous material content. The nominal feed design rate for the cell is 80tph of rougher concentrate. Commissioning commenced in March 2007.

For more information contact Le Huynh at Xstrata Technology, lhuyh@xstratatech.com.au ■



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