

CONFERENCE REPORT

XXII International Mineral Processing Congress. Cape Town, South Africa,
28 September–3 October 2003

The 22nd International Mineral Processing Congress was held at the Convention Centre in Cape Town, South Africa, the first ever IMPC to be held in Africa. The Congress was very well attended by approximately 620 delegates from 44 countries. The technical programme consisted of five plenary sessions and eight keynote presentations, followed by three parallel sessions. In addition, a record number of exhibitors of equipment and services contributed to the wide spectrum of discussions and stimuli available to delegates.

Plenary presentations were all outstanding: Brian Gilbertson's in-depth analysis of globalization in mining industries, Jim Finch's discussion of the future of mineral processing education and R. Batterham's views on the mine of the future kept the audience fully concentrated throughout. R. Williams's ideas about the impact of fundamental research on future mineral processing operations and J. van Deventer's treatise on sustainability in the minerals industry set the field for vibrant discussion and counter-arguments.

Keynote lectures on various themes covered such diverse areas as comminution, flotation, hydrometallurgy, simulation and control, pyrometallurgy and base and precious metals processing. Of significant interest to the readers of this journal is lecture by W. Dalmijn on the optimization of the resource cycle impact of the combination of technology, legislation and economy. It was argued that central to optimizing this resource cycle lies the control of physical separation plants by the application of advanced sensor technology and sorting equipment, as well as suitable control and sampling algorithms supported by optimizing mass balance models.

In parallel sessions, approximately 128 papers were presented in 'long' presentations and about 70 as 'snap shot' short presentations. Twenty minutes for 'long' presentations proved in many cases too short for an in-depth presentation of meaningful outcomes. Inevitably superficial coverage, often in haste, of experimental or theoretical observations often did not match the high quality of plenary and keynote presentations. A contributory factor was poor time management resulting from the long walks that delegates had to take to the watering hole during tea-breaks in the hiker-friendly Convention Centre.

While flotation was afforded 60 oral presentations, only three papers on physical methods of materials treatment were included in these sessions. M.S. Brennan *et al.* (JK Mineral Research Centre, Brisbane, Australia) reported on their studies of the dense medium cyclone using computation fluid dynamics (CFD) software.

Measurements by gamma-ray tomography of the segregation of medium in the DMS cyclone and the performance of a novel classifying cyclone design have been used to test and interpret the 3D CFD predictions. The predictions of the CFD models were generally plausible, though more work is required to incorporate turbulent mixing of the slurry in the cyclone. The novel cyclone design is based on observations that short-circuiting at the vortex finder plus the removal of the air core from the wall at the apex are beneficial to the DMS operation.

F.B. Waanders and A. Mans (University of Potchefstroom, South Africa) discussed the reasons for losses of ferrosilicon of DMS. They observed that the biggest loss of FeSi was due to the abrasion of the particles during the DMS process. This resulted in the liberation of Fe and subsequent formation of an oxihydroxide froth. A change in magnetic properties was also observed, leading to further losses.

H.R. Manoucheri (formerly of University of Lulea, Sweden) presented his results on electrical separation of wollastonite, quartz and feldspar. Charge acquisitions of different size fractions of these minerals in a triboelectrical separator were monitored and their energy work functions were determined. The findings from simple single mineral systems were translated into a complex ore situation and favourable prospects for the application of triboelectrical separation for beneficiation of complex raw materials were observed.

While the first mentioned paper was included in the session on Classification, the last two papers were, inexplicably, incorporated in the Flotation Session. The only oral paper on magnetic separation was, rather curiously, allocated to the Gravity Session. In their presentation, J. Svoboda (De Beers Consolidated Mines, South Africa) and T. Fujita (University of Tokyo) reviewed the current status and history of innovation in magnetic methods of material treatment. The milestones and key drivers of innovation were identified, advantages of the magnetic technology were discussed and reasons for its failure were identified. The future focus of magnetic separation in various areas of material handling was discussed and the research and development needs were outlined.

A number of interesting contributions were presented as posters: Correlation between liberation parameters and the efficiency of mineral beneficiation processes (V. Karmazin, Moscow, Russia), Two-phase stream analysis in gravity separation (E. Barsky *et al.*, Israel), SLON magnetic separators (Xiong, China), Cyclones in mineral processing (Bosman *et al.*), Measurement of resistivity of titanium minerals in corona field (Ng *et al.*, Brisbane, Australia) are examples of posters that should have been presented orally rather than in poster form.

Criteria used by the Technical Committee of the Congress to allocate slots to papers are actually rather difficult to fathom: apart from a rather bizarre allocation of some of the oral papers to unsuitable specialized sessions, it was unfair to many overseas delegates who travelled a long distance to have their, often valuable and innovative, papers relegated to posters. Particularly so, as 20 contributions, representing more than 10% of all contributions, from the home Universities of Stellenbosch and Cape Town, the organizers of the conference, found their way to oral sessions.

It was also felt that contributions that represented true technology transfer from research to development and to industrial practice (such as the installation of more than 200 modern SLON magnetic separators at mineral beneficiation plants in China) should have been given a place in the programme. For instance, at the cost of one or two papers dealing with never-ending laboratory, seemingly blue-skies,

research in flotation. Until technology transfer from research to plant practice, considerably more complex and costly than often insular fundamental research, is seen as the ultimate goal even by the academics, and until communication between academic sector and industrial practice is truly nurtured, mineral processing will keep failing to implement new ideas and innovation at the required rate

Fortunately, many of the frustrations and disappointments related to the technical programme were eclipsed by a vigorous social programme. The Welcome Reception, generously sponsored by De Beers Consolidated Mines Ltd, was an excellent opportunity to meet informally old friends and to make new ones. The African Theme evening with its distinct African flavour was enjoyed by all.

The banquet dinner, sponsored by Anglo American Platinum Corporation, which featured Barry Davidson, Chairman of Anglo American Platinum Corp., Ltd as the guest speaker and Professor Peter King as the recipient of the Lifetime Achievement Award, was an occasion for reflection for many a delegate. Finally, to add hearty measure of good cheer the Stellenbosch Libertas Choir offered an outstanding rendition of a selection of African songs.

All in all, the congress turned out to be a pleasant and worthwhile week with an opportunity to advance the cause of technology. It was also a success from the point of meeting colleagues and making new friends and contacts. The Proceedings of the conference were made available to each delegate on a CD, while hard copies are available from the organizers.

Jan Svoboda