Comminution '14

Sunday 6th April

16.30-18.00 Registration and wine reception, with hot and cold canapés (accompanying persons welcome)

Monday 7th April

07.30 Registration desk opens
   Light breakfast of filled croissants, tea, coffee and fruit juice

08.30 Opening Remarks
   B.A. Wills (MEI, UK) and M.S. Powell (JKMRC, Australia)

08.55 Presentation of 2013 MEI Young Person's Award

09.00 Technical Session 1
   Chairmen: L.M. Tavares (Universidade Federal do Rio de Janeiro, Brazil) and M.H. Moys (University of Witwatersrand, South Africa)

09.00 Keynote Lecture: The next stage of evolution in comminution
   A. Muir (AngloGold Ashanti, South Africa)

09.30 Implementation of dynamic simulation at Anglo Platinum
   G. Asbjörnsson, E. Hulthén and M. Evertsson (Chalmers University of Technology, Sweden)

09.50 Mechanistic modeling of the vertical shaft impact crusher (VSI)
   E.R. da Cunha, R.M. de Carvalho and L.M. Tavares (Universidade Federal do Rio de Janeiro, Brazil)

10.10 Coffee, exhibition and poster viewing

11.10 Control systems for improvement of cone crusher yield and operation
   M. Evertsson and E. Hulthén (Chalmers University of Technology, Sweden) and M. Nordström (Roctrim AB, Sweden)

11.30 Validation of product size distribution and throughput predicted by DEM for a cone crusher
   P.W. Cleary, G.W. Delaney, M.D. Sinnott (CSIRO Computational Informatics, Australia) and R.D. Morrison (JKMRC, Australia)

11.50 Strategies for size reduction control in cone crushers
   P. Ilavuo, T. Väyrynen, M. Vilkko (Tampere University of Technology, Finland) and A. Jaatinen (Metso Automation, Finland)
12.10 Real-time optimization of a speed controlled cone crusher in an iron ore application 73
E. Hulthén, M. Evertsson (Chalmers University of Technology, Sweden), K. Hofling (Roctim AB, Sweden), E. Öberg, A. Apelqvist and A. Sundvall (LKAB, Sweden)

12.30 Adaptive mass flow sensor calibration method for crushing circuits 85
T. Väyrynen, P. Itävuo, M. Vilkko (Tampere University of Technology, Finland) and A. Jaatinen (Metso Automation, Finland)

12.50 Lunch

14.00 Technical Session 2
Chairmen: K.P. van der Wielen (SELFRAAG AG, Switzerland) and A. Hinde (Mintek, South Africa)

14.00 Modelling the influence on power draw of the slurry phase in autogenous (AG), semi-autogenous (SAG) and ball mills
S. Morrell (Citic SMCC Process Technology Pty Ltd, Australia)

14.20 Predicting the evolution of rock size distribution, throughput and product size in AG and SAG mills by incremental damage, chipping, rounding and abrasion
R.D. Morrison, M. Powell (JKMRC, Australia), P.W Cleary, G.W. Delaney, S. Cummins (CSIRO Computational Informatics, Australia) and B. Loveday (University of KwaZulu-Natal, South Africa)

14.40 An extended model for the Drop Weight Test 127
C.L. Schneider and T.B. Duque (CETEM, Brazil)

15.00 Comparison of single particle, Bond and bed tests for fine particle ore breakage characterisation 141
G.R. Ballantyne, F. Shi, B. Bonfils and M.S. Powell (JKMRC, Australia)

15.20 Coffee

16.00 Breakage characterization of multicomponent ore N/A
L.X. Liu, F. Saeidi and M.S. Powell (JKMRC, Australia)

16.20 What is needed to develop the next generation of mechanistic breakage models in comminution? 148
R. Chandramohan (Ausenco Services Ltd, Australia), B. Bonfils and M. Yahyaei (JKMRC, Australia)

16.40 Modelling particle size reduction in a batch grinding ball mill 154
F. Shi, W. Xie and M. Powell (JKMRC, Australia)

17.00 Happy Hour. Vineyard Gardens. Accompanying guests welcome

Tuesday 8th April

08.10 Light breakfast

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Chairmen: B.I. Palsson (Luleå University of Technology, Sweden) and I. Govender (University of Cape Town, South Africa)

08.50 Keynote Lecture: Is progress in energy-efficient comminution doomed? 166
T. Napier-Munn (JKMRC, Australia)

09.20 An energy based comparison of vertical roller mills and tumbling mills 180
D.I.T. Plochberger and D.I.M.B. Avila (Cemtec, Austria)

09.40 Energy distribution models in tumbling mills using positron emission particle tracking 187
T. Pathmathas, I. Govender and D. De Klerk (University of Cape Town, South Africa)

10.00 Coarse waste rejection using sensor based technologies 198
W. Millar, D.J. Bowman, R.A. Bearman (Bear Rock Solutions, Australia), D. Miljak and N. Cutmore (CSIRO Minerals Down Under Flagship, Australia)
10.20  Positron emission particle tracking in tumbling mills 208
I. Govender, D. de Klerk and A.N. Mainza (University of Cape Town, South Africa)

10.40  Coffee

11.20  Predicting charge motion, slurry flow and rock breakage within and discharge from a 3D pilot SAG mill using a coupled DEM-SPH model 217
P.W. Cleary (CSIRO Computational Informatics, Australia) and R.D. Morrison (JKMRC, Australia)

11.40  Comminution circuit design, what test work is required for a bankable feasibility study? 235
J. Starkey and M. Brissette (Starkey & Associates, Canada)

12.00  Dry grinding: current and future systems in mineral processing 244
E. Burchardt and W. Brandhoff (ThyssenKrupp Resource Technologies, Germany)

12.20  Research of iron ore grinding in a Vertical-Roller-Mill 259
M. Reichert, H. Lieberwith (TU Bergakademie Freibery, Germany), C. Gerold (Loesche GmbH, Germany), A. Fredriksson and G. Adolfsson (LKAB, Sweden)

12.40  Lunch

14.00  Technical Session 4
Chairman: H. Lieberwith (TU Bergakademie Freibery, Germany)

14.00  Wear in high pressure grinding rolls subjected to the composition of heterogeneous abrasive materials 275
Y. Sesemann, C. Broeckmann (RWTH Aachen University, Germany) and A. Höfler (Köppern Entwicklungs GmbH, Germany)

14.20  New population balance model for predicting particle size evolution in compression grinding 287
V.P.B. Esnault, H. Zhou and D. Heitzmann (Lafarge Centre de Recherche, France)

14.40  Sample requirements for HPGR testing procedure 294
V.K. Alves (VALE S.A, Brazil), C.L. Schneider, T.B. Duque (CETEM, Brazil) and A.E.C. Peres (UFMG, Brazil)

15.00  Pellet feed grinding by HPGR 306
F.P. van der Meer and S. Oenol (Weir Minerals, The Netherlands)

15.20  A DEM model of HPGR operation using bed compression models calibrated with a piston die test 324
G.K.P. Barrios, L.M. Tavares (University of Rio de Janeiro, Brazil) and J. Pérez-Prim (DEM Solutions Ltd, UK)

15.40  FLSmidth® F360 HPGR test campaign Rio Tinto Kennecott Utah Copper Mine 332
J. Pownell and T. Bookless (FLSmidth, USA)

16.00  Coffee

18.30  Coaches depart for conference dinner in Cape Town
Wednesday 9th April

08.15  Light breakfast of filled croissants, tea, coffee and fruit juice

09.00  **Technical Session 5**
Chairmen: C.L. Schneider (CETEM, Brazil) and H.-R. Manouchehri (Sandvik Mining, Sweden)

09.00  **Keynote Lecture: A multiscale view on comminution**  353
W. Peukert (University Erlangen, Germany)

09.30  **Predicting breakage rates of fine particles in stirred media mills depending on stressing energy and frequency**  363
G. Gronau, S. Beinert, C. Schilde and A. Kwade (Technische Universität Braunschweig, Germany)

09.50  **Shear based stirred mill power model – an adimensional analysis**  N/A
P. Radziszewski (Metso Minerals, Canada)

10.10  **Technical gaps and challenges for fine grinding**  371
L.X. Liu, S. Palaniandy and M.S. Powell (JKMRC, Australia)

10.20  **Economical optimization of stirred media milling processes**  383
A. Kwade (Technische Universität Braunschweig, Germany)

10.40  Coffee

11.20  **Development of the Larson/Morrison IsaMill JKSimMet model**  394
M. Larson, M. Young (Xstrata Technology, Australia), R. Morrison and Weiguo Xie (JKMRC, Australia)

11.40  **VertiMill® - Preparing the feed within floatable regime at lower specific energy**  408
S. Palaniandy, M. Powell, M. Hilden (JKMRC, Australia), J. Allen (Metso Mining and Construction, USA), K. Kermanshahi (Metso Minerals Ltd, Australia), B. Oats and Mark Lollback (BHP Billiton, Australia)

12.00  **Pilot scale studies in fine grinding with Outotec HIGmills**  423
H. Lehto (Outotec Oy, Finland)

12.20  **Mixed media milling- a new operating technique for dry agitated media mills**  439
C. Martin (RSG Inc., USA)

12.40  Lunch

14.00  **Technical Session 6**
Chairmen: R. Chandramohan (Ausenco Services Ltd, Australia) and S. Palaniandy (JKMRC, Australia)

14.00  **Vertical agitated media mill scale-up and simulation**  N/A
D.B. Mazzinshape, R. Galéry (UFMG, Brazil), C.L. Schneider (CETEM, Brazil) and V.K. Alves (VALE S.A., Brazil)

14.20  **The research for selection of the third mill of a refractory micro-fine iron ore**  443
X. Xiao, G. Zhang, X. Zhao, L. Huang, L. Shi and Y. Long (Changsha Research Institute of Mining & Metallurgy, China)

14.40  **Ultra fine grinding gold sulphide float concentrates, the economic drivers and challenges**  456
D. Capstick (FLSmidth, South Africa)

15.00  **Evaluation of grinding media wear-rate by a combined grinding method**  464
J. Wang, B. Wang, F. He, X. Zhou, W. Deng, H. Xu (King’s Ceramics, China) and Q. Li (East China Normal University, China)

15.20  Coffee
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<td>Thinking outside of the sphere – adventures in space mining</td>
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<td>17.00</td>
<td>Happy Hour. Vineyard Gardens. Accompanying guests welcome</td>
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**Thursday 10th April**

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P. Silbermann (ThyssenKrupp Resource Technologies, Germany)                                                                                     |      |
| 09.20 | Energy efficiency in comminution: Vibrocone, a crusher having grinding performance                                                                                                                     | 527  |
|       | H.-R. Manouchehri (Sandvik Mining, Sweden)                                                                                                                                                             |      |
| 09.40 | SAG mill functionality optimization by Medium Voltage VFD utilization: Rudnik Alexandrovskiy experience  
A. Gaztelu, I. Atutxa and I. Legarra (Ingeteam Power Technology, Spain)                                                                                  | 539  |
| 10.00 | Mill discharge modification – from a pilot plant testwork to an industrial test at Mortimer UG2  
J. Dahner (Magotteaux (Pty) Ltd, South Africa), A. Van den Bosch (Magotteaux SA, Belgium) and G. Makgopo (Anglo American Platinum, South Africa)    | 556  |
| 10.20 | Validation of a model for physical interactions between pulp, charge and mill structure in tumbling mills  
P. Jonsén, J. Stener, B.I. Pålsson and H.-Å. Häggblad (Luleå University of Technology, Sweden)                                               | 571  |
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| 11.20 | Testing of a new mechanistic slurry transport model with Positron Emission Particle Tracking  
G.B. Tupper, J. Govender, D. de Klerk, A.N. Mainza (University of Cape Town, South Africa), and J. Mann (Anglo American Platinum, South Africa)       | 588  |
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14.20  **The design and optimisation of grinding circuits incorporating stack sizer screens**  668
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14.40  **Grind circuit optimization at Rio Tinto Kennecott using real-time measurement of individual hydrocyclone overflow stream particle size enabled by novel CYCLONEtrac™ technology**  694
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15.00  **Conference summary and open discussion on the future of comminution**  N/A
A.N. Mainza (University of Cape Town, South Africa)

15.40  **Closing Remarks and Invitation to Comminution '16**  N/A
A.J. Wills (MEI, UK)

15.45  Farewell Coffee and Wine in Vineyard Gardens (accompanying persons welcome)

**POSTERS**

Development of a mechanistic model to define the incremental damage mechanics of rock samples  N/A
R. Chandramohan (Ausenco Services Ltd, Australia) and B. Bonfils (JKMRC, Australia)

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R. Johansson and M. Evertsson (Chalmers University of Technology, Sweden)

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R. Gunda and M.H. Moys (University of the Witwatersrand, South Africa)

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J. Russell (Russell Mineral Equipment Pty Ltd, Australia)

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An assessment of the rock characteristics and the ball mill energy requirements at a mine in Ghana, West Africa
K.A. Boateng (AngloGold Ashanti, Ghana), C.E. Abbey and R.K. Amankwah (University of Mines and Technology, Ghana)

Mechanical impacts analysis in SAG mills due to small failures in the electric drive
V. Guerrero and J. Pontt (Universidad Federico Santa Maria, Chile)

Modelling the energy spectra of a tumbling mill using DEM
L. Bbosa, A. Mainza and I. Govender (University of Cape Town, South Africa)

Mechanistic modelling of grinding in continuous ball mills
R. Carvalho and L.M. Tavares (Universidade Federal do Rio de Janeiro, Brazil)