TABLE OF CONTENTS

Longwall Mining


2. Rock fracture, caving and interaction of face supports under different geological environments. Experience from Australian coal mines, W. Gale, SCT Operations Pty. Ltd., Wollongong, Australia .................................................. 11


6. Application of yieldable and cuttable pump crib in longwall recovery room, Q. Gu, J. Popovich, and M. Zekas, MICON, Glassport, PA and A. Campoli, Minova USA Inc., Georgetown, KY ............ 42

Roof Mapping and Void Detection

7. Field testing of a real time roof mapping drilling display system in a limestone mine, C. Collins and G. Wilson, J.H. Fletcher & Co, Huntington, WV and D. Tang and S. Peng, West Virginia University, Morgantown, WV .................................................. 48


Pillar Failure/Extraction/Strength

9. Violent coal pillar collapse - a case study, A. Zingano, J. Koppe, and J. Costa, Federal University of Rio Grande do Sul, Porto Alegre, Brazil ............................................ 60
23rd International Conference on Ground Control in Mining

10. Stooping low safety factor pillars at Goedehoop Colliery - 12 months later, G. Makusha, Anglo American Operations, Witbank, South Africa ................................................................. 68

11. Laboratory strength testing of coal from selected Illinois seams, E. Kroeger, E. Roethe, and X. Li, Southern Illinois University Carbondale, Carbondale, IL ......................................................... 77

Horizontal Stress


13. Effect of in situ stresses on the stability of coal mine development workings, M. Gadde and S. Peng, West Virginia University, Morgantown, WV ......................................................... 92


Ground Control I

15. Numerical modeling for increased understanding of the behavior and performance of coal mine stoppings, L. Burke, A. Iannacchione, and T. Barczak, NIOSH-Pittsburgh Research Laboratory, Pittsburgh, PA and E. Westman, Virginia Polytechnic Institute and State University, Blacksburg, VA .................................................. 112

16. Evaluation of rockburst hazard from core testing, M. Alber and S. Rühl, Ruhr-University, Bochum, Germany and N. Polysos, Deutsche Steinkohle AG, Herne, Germany .................................................. 119

17. Investigation of electromagnetic emissions in a deep underground mine, D. Scott and T. Williams, NIOSH-Spokane Research Laboratory, Spokane, WA and S. Knoll, Coeur Silver Valley, Inc, Wallace, ID ........................................................................................................ 125

18. Development and application of geotechnical and rockmechanical standard planning system for roadway development in German coal mines, K. Brandt, H. Witthaus, and N. Polysos, Deutsche Steinkohle AG, Herne, Germany ........................................................................ 133

19. Laboratory testing of rib straps, E. Kroeger and X. Li, Southern Illinois University Carbondale, Carbondale, IL .............................................................................. 138
23rd International Conference on Ground Control in Mining

Multiple-Seam Mining

20. The new two-dimension LaModel program, O. Akinkugbe and K. Heasley, West Virginia University, Morgantown, WV .......................... 146


Subsidence

22. A method to determine expander spacing for steel pipelines in mining districts, A. Preusse, RWTH Aachen University, Aachen, Germany, A. Stoka, Freiberg University of Mining & Technology, Freiberg, Germany, P. Spielberg, Deutsche Steinkohle AG, Duisberg, Germany, and H. Kateloe and D. Clemens, RWTH Aachen University, Aachen, Germany ........................................... 165


Ground Control II

24. Spatial trends in rock strength - can they be determined from coreholes?, C. Mark, L. McWilliams, and D. Pappas, NIOSH-Pittsburgh Research Laboratory, Pittsburgh, PA and J. Rusnak, Peabody Energy, St. Louis, MO ........................................... 177

25. Development and demonstration of an alternate mining geometry for improved ground control in an Illinois coal mine, Y. Chugh, Southern Illinois University Carbondale, Carbondale, IL, W. Pytel, CBPM “Cuprum” OBR, Wroclaw, Poland, and J. Ma, Southern Illinois University Carbondale, Carbondale, IL ........................................... 183

Roof Grouting

26. Evaluation of polyurethane injection for beltway roof stabilization in a West Virginia coal mine, G. Molinda, NIOSH-Pittsburgh Research Laboratory, Pittsburgh, PA ........................................... 190

27. Application of ground penetrating radar to evaluate the extent of polyurethane grout infiltration for mine roof control - a case study, W. Monaghan and M. Trevits, NIOSH-Pittsburgh Research Laboratory, Pittsburgh, PA ........................................... 197
23rd International Conference on Ground Control in Mining

Surface Mining


29. Analysis of practical ground control issues in highwall mining, R. Zipf, Jr. and S. Bhatt, NIOSH-Pittsburgh Research Laboratory, Pittsburgh, PA ................................................................. 210

Control of Very Weak Roof

30. Preventing falls of ground in coal mines with exceptionally low-strength roof: two case studies, C. Mark, G. Molinda, and L. Burke, NIOSH-Pittsburgh Research Laboratory, Pittsburgh, PA and P. Padgett, Black Beauty Coal Company, Evansville, IN ................................. 220

31. Geo-mechanical property and failures of weak roof shales in coal mines, Y. Zhang, J. Han, K. Heasley, and S. Peng, West Virginia University, Morgantown, WV and P. Padgett, Black Beauty Coal Company, Evansville, IN .................................................. 228

Roof Bolting

32. Eclipse system bolting in the Illinois basin, A. Campoli, Minova USA, Georgetown, KY and S. Shapkoff, Excel Mining Systems, Marion, IL ................................................................. 235

33. Variation in the load transfer of fully encapsulated rockbolts, P. Hagan, The University of New South Wales, Sydney, Australia ................................................................. 242

34. Bolt load changes during initial face advance and cross-cut breakthrough, S. Signer, NIOSH-Spokane Research Laboratory, Spokane, WA, PA and J. Pile and S. Bessinger, BHP Billiton San Juan Coal Company, Waterflow, NM ................................................................. 250

35. Coal mine primary support selection: tension versus non tensioned roof bolt systems, K. Unrug, University of Kentucky, Lexington, KY, P. Padgett, Black Beauty Coal Company, Evansville, IN, and A. Campoli, Minova USA, Georgetown, KY ................................................................. 258

36. Improving stope support at Modikwa platinum mine, J. van Vuuren, Rock Mechanics Technology Ltd., Johannesburg, South Africa and M. Da Costa, Modikwa Platinum Mine, Steelpoort, South Africa ................................................................. 264

37. 3D FEM simulation for fully grouted bolts, K. Morsy and J. Han, West Virginia University, Morgantown, WV, A. Yassien, Suez Canal University, Suez, Egypt, and A. Khair and S. Peng, West Virginia University, Morgantown, WV ................................................................. 273
38. An investigation into the effectiveness of support systems combining steel supports and rock bolts within coal mine roadways, D. Reddish, R. Stace, D. Booth, and D. Whittles, University of Nottingham, Nottingham, United Kingdom

39. Innovative Supports

Hydraulic prestressing units: an innovation in roof support technology, T. Barczak and S. Tadolini, NIOSH-Pittsburgh Research Laboratory, Pittsburgh, PA and P. McKeelvey, New Concept Mining, Johannesburg, South Africa

40. Improving roof truss performance, J. Pile, S. Bessinger, and J. Swensen, BHP Billiton San Juan Coal Company, Waterflow, NM and R. Brandon and A. Wallenstein, Dywidag-Systems International, Salt Lake City, UT

41. Coal combustion byproducts-based artificial mine supports - recent developments, Y. Chugh and J. Ma, Southern Illinois University Carbondale, Carbondale, IL

42. Stone Mining

The influence of horizontal stress on pillar design and mine layout at two underground limestone mines, G. Kuhnhein and R. Ramer, Carneuse Lime Company, Butler, KY

43. Investigation of pillar-roof contact failure in northern Appalachian stone mine workings, G. Esterhuizen and A. Iannacchione, NIOSH-Pittsburgh Research Laboratory, Pittsburgh, PA

44. Mapping hazards with microseismic technology to anticipate roof falls - a case study, A. Iannacchione, T. Batchler, and T. Marshall, NIOSH-Pittsburgh Research Laboratory, Pittsburgh, PA

45. Ground Control III

Practical detection of underground mine roof failure, D. Bigby and A. Bloor, Rock Mechanics Technology Ltd., Burton-on-Trent, United Kingdom and C. Chester, Camborne School of Mines, Redruth, United Kingdom
46. Heat-imaging experimental study of reducing local gas accumulation by rotary radial jet, S. Yang, China University of Mining and Technology, Jiangsu, China, Q. Wang, Xuzhou Mining Administration, Jiangsu, China, and H. Xia, Q. Yu, B. Yu, F. Wang, and L. Wang, China University of Mining and Technology, Jiangsu, China ........................................... 344

47. Microcirculation theory analysis of spontaneous combustion of loosing coal in the top-coal caving region of entry, Q. Wang, Xuzhou Mining Administration, Jiangsu, China and S. Yang, D. Zhang, Q. Yu, F. Wang, and L. Wang, China University of Mining and Technology, Jiangsu, China ........................................... 349

Author's Index ................................................................. 355