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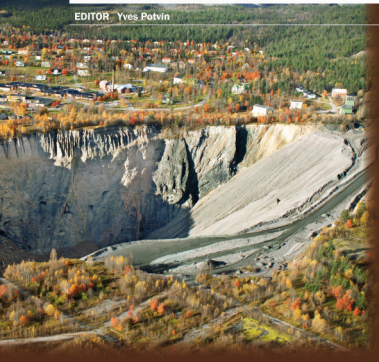
Caving 2010

PROCEEDINGS OF THE

**Second International Symposium
on Block and Sublevel Caving**

20-22 APRIL 2010 | PERTH | AUSTRALIA

EDITOR Yves Potvin



CAVING **2010**

Second International Symposium on
Block and Sublevel Caving

Proceedings of the Second International Symposium on Block and Sublevel Caving

20–22 April 2010, Perth, Australia

EDITOR

Yves Potvin

Australian Centre for Geomechanics,
The University of Western Australia, Australia



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The papers contained in this publication are for general information only, and readers are cautioned to take expert advice on cave mining projects.

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Australian Centre for Geomechanics

The Australian Centre for Geomechanics was formally established in 1992 as a University of Western Australia research centre in order to promote research excellence and continuing education in geomechanics, with particular emphasis on its application to the mineral and energy extraction sections of Australia's resource industry.

The Australian Centre for Geomechanics is an unincorporated Joint Venture involving:

- Curtin University of Technology – Western Australian School of Mines
- CSIRO Division of Exploration and Mining
- The University of Western Australia – School of Civil and Resource Engineering.

The Centre draws together its staff knowledge and experiences with the expertise within the three groups forming the Centre and facilitates a multi-disciplinary approach to research and education in geomechanics. Research undertaken by the ACG attracts both national and global support and the outcomes of the projects are utilised to promote safer mining and environmental geomechanics practices, operating efficiencies and to meeting community expectations for sustainable mining practices.

With the guidance of strong industry representation on the Board of Management, and close collaboration with senior representatives of the mining industry, research, training and further education activities are tailored directly to the needs of industry. The ACG Board expects the Australian Centre for Geomechanics to be the focal point for industry on geomechanics issues and to address the needs of industry through a collaborative interdisciplinary approach.

TECHNICAL REVIEWERS

The dedicated efforts of the peer reviewers have resulted in the high quality of the technical programme and the papers compiled for this publication. The editor thanks the following people who contributed their time and expertise as reviewers of manuscripts for the Second International Symposium on Block and Sublevel Caving held in Perth, Australia. A technical and critical review of each paper was undertaken by a minimum of two reviewers for the production of this volume.

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PREFACE

The Second International Symposium on Block and Sublevel Caving was held in Perth on 20–22 April 2010. This is the second of a new series of symposia entirely dedicated to cave mining, and follows the first symposium held in Cape Town, South Africa in 2007.

Cave mining has become one of the most research intensive areas of mining engineering. Mining companies need to be kept informed of the latest technological developments from caving research, and researchers require a regular platform to present their results and interact with colleagues and industry practitioners.

The initiators of the symposium series, Professor Dick Stacey and The South African Institute of Mining and Metallurgy, saw the need for a symposium dedicated entirely to block and sublevel caving as a complimentary event to the well established and broader focussed MassMin series. It is intended to hold this symposium series every four years, leap-frogging the quadrennial MassMin conferences.

More than 80 abstracts were submitted to the review committee. The proceedings of Caving 2010 features 50 peer reviewed technical papers from a truly international authorship from many countries around the world, including:

- Australia
- Canada
- Chile
- Germany
- Indonesia
- Norway
- South Africa
- Sweden
- New Zealand
- United Kingdom
- United States of America

The contributions from all authors are acknowledged as they produced very high quality manuscripts. The presentations were grouped under these technical themes: Monitoring, Subsidence, Planning and Design, Draw Control, Geomechanics of Caving Mines, Numerical Modelling and Preconditioning.

Two keynotes were presented at the symposium. Professor Bill Hustrulid, a world expert in cave mining, provided comments from his latest research on drifting practices at NIOSH. This is a key topic for cave mines as a large proportion of the intensive initial investment is spent on drifting activities. Professor Gideon Chitombo, as the leader of the International Cave Study (ICS) and Mass Mining Technology (MMT) research projects, was well positioned to provide through his keynote, a comprehensive account of the research outcomes in cave mining during the last sixteen years.

The organisation of this symposium series is steered by an international committee consisting of Professor Dick Stacey, Professor of Rock Engineering, University of the Witwatersrand; Professor John Hadjigeorgiou, Director, Lassonde Mineral Engineering Program and Lassonde Institute for Engineering Geosciences, University of Toronto; and Professor Yves Potvin, Director, Australian Centre for Geomechanics.

Thanks are due to all authors, reviewers and to the Caving 2010 team at the Australian Centre for Geomechanics.

Yves Potvin

Chair, Second International Symposium on Block and Sublevel Caving

Director, Australian Centre for Geomechanics, The University of Western Australia

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