Underground Design Methods 2015

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Editor

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ACG AUSTRALIAN CENTRE FOR GEOMECHANICS

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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:

- CSIRO Earth Science and Resource Engineering
- The University of Western Australia — School of Civil, Environmental and Mining Engineering

The Centre draws together its staff knowledge and experiences with the expertise within the two 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 proceedings of the International Seminar on Design Methods in Underground Mining held in Perth, Western 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 creation of the inaugural Seminar on Design Methods in Underground Mining was inspired by my attendance at a specialised conference on Applied Empirical Design Methods in Peru last year, organised by the International Society for Rock Mechanics. The conference offered a unique opportunity for attendees to discover some of the intricacies of applying empirical design methods to a variety of worldwide projects. The success of and interest generated by this conference convinced me that this topic should be further explored. However, considering an Australian audience, I felt the need to broaden the main conference theme beyond the empirical design framework and, at the same time, concentrate on its application to underground mining.

Recognising the leadership of Canadians in the field of underground mine design, two professors and practitioners from Canada were invited to deliver keynotes: Professor Emeritus Rimas Pakalnis, who is well known for his involvement in the development of several empirical design techniques; and Professor Emeritus Will Bawden, who has extensive experience with empirical and numerical approaches and is a strong promoter of geotechnical instrumentation and technology in underground mines. Emeritus Professor Dick Stacey from South Africa was also invited to present a keynote. He outlined his views on the significant topic of design process. Paul Harris, MMG's Dugald River mine manager, presented the fourth keynote on one of the most exciting and challenging new underground mining projects in Australia.

These proceedings feature forty-three high quality technical papers with submissions from more than 10 countries (Australia, Brazil, Canada, Chile, China, India, South Africa, Sri Lanka, Sweden, UK and the USA), which address a wide spectrum of themes that are central to the application of design methods in underground mines. The first section focusses on the numerical modelling approach, which is one of the most prominent design methods. Sections are also dedicated to specific components of underground mine design, such as pillar design, support design and orepass design. Three sections directly address parts of the design process, including input data, planning and optimisation of design. These proceedings further comprise sections on specific design challenges such as dilution control and seismicity.

It is intended that further seminars on design methods in different mining countries will be organised in years to come, with the goal of stimulating authorship and producing important references on this significant topic.

Professor Yves Potvin

Director, Australian Centre for Geomechanics

Chair, International Seminar on Design Methods in Underground Mining

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