

INVITED SPEAKERS

1. A NEW TESTING METHOD FOR DETERMINATION OF UNCOFINED COMPRESSIVE STRENGTH (UCS): CORE STRANGLE TEST (CST)

Prof. Dr. Isik Yilmaz, Cumhuriyet University, Sivas, TURKEY



Prof. Dr. **Isik YILMAZ** is lecturer and scientist in Cumhuriyet University in Turkey and a specialist on the subjects of engineering geology, rock mechanics, soil mechanics, GIS, soft computing techniques in rock / soil parameter estimation and hazard / susceptibility mapping of landslide and liquefaction. He has 5 books and more than 100 papers published in many International Journals. He is the Editor and/or Editorial board member of many International Journals

such as; Environmental Geology, Environmental Earth Sciences, Bulletin of Engineering Geology and the Environment, Scientific Research and Essays, International journal of Soft Computing, Journal of Engineering and Applied Sciences, The Open Geology Journal, Journal of Environmental Protection, etc.

ABSTRACT: A new testing method for indirect determination of Unconfined Compressive Strength (UCS) of the rock core samples is herein presented. As known, there are some methods for indirect estimation of UCS such as; point load index (I_s), Schmidt hammer, sonic velocity, block punch strength test etc. However point load index testing method is widely used to estimate the UCS, there are many problems and limitations related to this method as reported in the recent literature. It was obtained that *CST* proposed in this paper namely “*Core Strangle Test (CST)*” had minimized some of the deficiencies, limitations etc. The principle of this test depends on the “*strangle*” type of loading a core along a circle perpendicular to the core axis. In the first stage of the studies, blocks of different type of rocks having the strength in a range from weak to strong were collected and cored for UCS, Point Load Index and *CST* tests. These tests were then conducted and relationships between UCS with $I_{s(50)}$ and *CST* were empirically explained and discussed in a point of the view of the usefulness of the method developed. Performance of indirect estimation of tensile strength of rocks from Core Strangle Test (*CST*), and potential use of Core Strangle Index (*CSI*) in rock mass classification systems is also presented. As a result of this study, higher performance was obtained, and *CST* tests led to considerably lower errors in determining the tensile strength when compared with the results obtained from point load index tests. Moreover, it was found that *CSI* can also be used as an alternative input parameter in rock mass classification systems (*RMR* and *Q*) by means of intact rock strength.

2. MUCK CLASSIFICATION: RAW MATERIAL OR WASTE IN TUNNELLING OPERATION.

Dr. C.Oggeri*, T.M. Fenoglio*, R.Vinai**; *DIATI Politecnico of Torino, Italy; **Queen's University, Belfast, Northern Ireland



Dr Claudio Oggeri is assistant professor and researcher at the Polytechnic of Turin, DIATI Department of Environment, Land and Infrastructure Engineering at Soil Mechanics Laboratory, Italy

Area of interest: Engineering and safety of the excavations, Industrial and Computer Engineering)

ABSTRACT: Tunnel construction, structural diaphragms, debris from quarry exploitation require careful consideration of the spoil management, as this involves environmental, economic and legal requirements. In this paper a classification that considers the interaction between technical and geological factors in determining the features of the resulting muck is proposed. This gives indications about the required treatments as well as laboratory and field characterisation tests to be performed to assess muck recovery alternatives. While this reuse is an opportunity for excavations in good quality homogeneous grounds (e.g. granitic mass), it is critical for complex formation. It is therefore necessary to define a procedure that enables to assess the properties of natural ground and of the relative spoil or waste arising from the excavation or exploitation phases. This approach is presented in this paper for some tunnelling cases, where the materials are resulting from the tunnel excavation carried out with a large diameter Earth Pressure Balance shield (EPB) through a complex geological succession, from a tunnel in metamorphic rocks excavated by TBM and drill and blast and finally from the cut and cover method in urban area in alluvial coarse formation. Physical parameters and technological features of the materials have been assessed, according to their valorisation potential, for defining re-utilisation patterns. The methodology proved to be effective and the laboratory tests carried out on the materials allowed the suitability and treatment effectiveness for each muck recovery strategy to be defined.

3 IMPLEMENTATION OF REAL TIME GEOTECHNICAL MONITORING AT AN OPEN PIT MOUNTAIN COAL MINE IN WESTERN CANADA

Brian Klappstein, M.Sc., PGeo., *Manager of Long Range Planning, Grande Cache Coal LP, AB, Canada*

Gheorghe Bonci, PhD, PEng., *Faculty at British Columbia Institute of Technology, BC, Canada*

Wayne Maston, PEng., *Production Engineer Surface, Grande Cache Coal LP, AB, Canada*



Brian Klappstein graduated with Honors from University of Alberta's Geology Bachelor program (First Class Standing of 1978). He was also awarded a Master's in Structural Geology from the same university.

Mr. Klappstein is a Canadian Professional Geologist (APEGA), member of the Canadian Institute of Mining, Metallurgy and Petroleum and a QP according to NI 43-101 Canadian Securities Regulations. He has more than 26

years' experience in the coal mining industry, with expertise in: coal geology, coking and thermal coal utilization, geophysics, coal exploration, strategic and short range mine engineering, planning and scheduling, and automated geotechnical monitoring safety systems.

He has held positions of technical consultant and manager on many projects: project geologist, senior/chief geologist, superintendent of technical service for various companies such as Smoky River Coal and Grande Cache Coal Corporations. He has been pursued by coal mining industry clients for a wide variety of mine planning, mine development, and mine evaluation tasks (e.g., Western Canadian Coal, Prince Water House Cooper).

He currently holds the rank of Long Range Planning Manager at Grande Cache Coal LP, Alberta, Canada and also manages Geoprog Consulting Company in Grande Cache, Alberta.



Gheorghe Bonci is an alumnus (class of 1984) of Mining Institute of Petrosani - University of Petrosani. He holds a Ph.D. in Technical Sciences – Mining and Petroleum, with a specialization in Mining Environmental Risk.

Dr. Bonci is a Canadian Professional Engineer (APEGBC) and member of the Canadian Institute of Mining, Metallurgy and Petroleum. He has 30 years of international experience in mining consulting, mining operations and education. He has held management, consulting and R&D positions for various companies in Europe and Canada (ICSITPML, Walter Energy, BGC

Engineering, and Grande Cache Coal LP).

Gheorghe Bonci has established himself as an expert in negotiating, structuring and managing risk for complex projects regarding mine feasibility, mine planning and optimization, monitoring of environmental aspects in mining regions, rehabilitation and restoration of degraded lands by industrial activities and mine closures. He has also authored more than 40 scientific and technical papers published in peer-reviewed technical journals or presented at various national and international conferences, committees and symposia.

Dr. Bonci currently serves as faculty member with the Mineral Exploration and Mining Technology Department at British Columbia Institute of Technology (BCIT), a Canadian

polytechnic institute. He teaches Surface Mining Design, Rock Mechanics, and Mining Software.

Mr. **Wayne Maston** is a Canadian certified Professional Engineer (APEGA, APEGNB) with 8 years' experience in the engineering, geological and operational aspects of both open pit and underground operations, as well as, exploration and environmental consulting.

He is proficient in most of the activities related to operations, technical services, project management, budgeting, cost control and cost saving initiative.

Wayne is a self-starter, who is driven on results but disciplined on the quality and accuracy of all work and believes contributions of every task/project, has a positive impact on cost, production and productivity.

ABSTRACT: The evolution of geotechnical monitoring technology for assessing slope stability issues in real time has progressed rapidly in the last few decades. The technology has advanced the safety of open pit operations and has the potential to change planning parameters, particularly in activities adjacent to public infrastructure, based on the additional confidence that operators gain from instantaneous access to information as pits are excavated and waste dumps are constructed.

This paper summarizes the experience of a coal mine operating in the rugged topography of the Alberta foothills, excavating extremely structurally complex coal deposits within thrust and fold belt geology. In the last decade, the geotechnical monitoring at this site progressed from manual (daily to monthly) monitoring of a network of survey prisms and piezometer installations, to real time (hourly or less) monitoring of slopes and slope foundations by multiple robotic total stations sampling prism networks on pit walls and dumps, slope scanning radar, piezometers and some manually monitored borehole slope inclinometers.

During this period, the mine experienced a number of slope failures on both pit walls and waste rock dumps. Backanalysis of these failures from the monitoring data has refined the understanding of the speed failures progress at, and the best metrics and thresholds to define how alarm systems should respond to deformation. Case studies are presented for both pit foot wall and dump failures.

4. LASER SCANNING TECHNOLOGY. Applications to the Mining Industry, Carrie Davidson & Carles Xandri, KRJA Systems Ltd trading as Maptek, UK



Carrie Davidson, Geoscientist, Maptek Edinburgh, UK

Carrie is currently working for Maptek as a Consultant Geoscientist.

Working as part of the technical services team, she has been involved in providing specialised training and software support for Vulcan – Maptek's 3D mining

software solution. This has allowed her to gain experience in many aspects of mine geology - from geological modelling through to grade estimation - in a range of deposit types. Carrie has also assisted with the geological modelling of metalliferous deposits in West Africa.

Previously, as part of her MSc, she carried out an investigation into the potential use of ground sourced heat for heating buildings in Glasgow city centre. Carrie has obtained an MSc in Environmental Engineering and BSc Hons in Environmental Geosciences.



Carles Xandri, *Mining Engineer Maptek* Edinburgh, UK

Currently working at Maptek as a Consulting Mining Engineer. In his current role he have been involved in Vulcan implementations in different mining companies and different projects. Vulcan is the mining software that Maptek owns. Also he have been contributing in the development of estrategic mine planning modules for the software.

Previoulsy he have been working for a surveying consulting firm studing the ground subsidence of a potash mine located in the north of Spain. Also he has been responsible for projects defining errors in the topographic connection between the surface and the interior of a mine through two

vertical shafts

ABSTRACT: Maptek presents the latest technological advancements and techniques in measuring, recording and analysing geotechnical structures using laser scanning technology. Three-dimensional laser scanning technology provides many advantages to surveyors, geologists and geotechnical engineers. Such professionals can collect valuable data at a safe distance from the working face, in large quantities, at high resolution. The latest advancements in software provide geotechnical engineers with the ability to perform large scale, first pass recording and analysis of the geotechnical structures measured by the scanner, expediting the process of identifying potential safety issues or rock competence limitations in open pit operations.

Once the physical scanning of the rock faces has been complete, the software kinematic analysis tool helps to identify the kenematic feasibility for sliding, wedge failures and toppling failures of an excavated face. The components examined include slope dip, slope dip direction, daylight envelope, slip limit, lateral limits, polar friction cone and planar friction cone.

In combination, the laser survey instrument and software tools provide a safe and effective methodology for measuring, recording and identifying potential geotechnical issues in open pit excavations.

5. MANAGEMENT BY VALUES (MBV) CONDITIONS IN MINING INDUSTRY

Jan Kudełko¹, Agata Juzyk², Leszek Zaremba³

¹KGHM Cuprum Ltd Research and Development Centre

²KGHM Polska Miedź S.A.

³KGHM Cuprum Ltd Research and Development Centre



Dr hab. inż. Jan Kudełko is Vice President at KGHM Cuprum Ltd Research and Development Centre, Director of CBR

Education: He received the Doctor of technical sciences in mining and geological engineering with a specialization in organization and economics of mining, Faculty of Geoengineering, Mining and Geology University of Technology since 2010. Between 1999-2001 he followed post-graduate studies "Management in market economy", University of Wrocław, Faculty of Law and Administration. He had a training about "Economic valuation and investment decision-making methods", Colorado School of Mines in

2001 and a training in "Methods for evaluation of investment projects in industry - geological mining by European standards", Imperial College of London in 1999.

His specialisation is organization and economics of mining.

ABSTRACT: Authors try to answer the question, what are the key success factors of managing the mining enterprise. Modern management methods were analyzed in the context of the mining industry, operating in challenging economic conditions in markets that are increasingly more global, complex, professionally demanding and constantly changing. The article outlines the approach that modern management methods, especially Management by Values (MBV), understood as defining key goals of the company and stating what core values define the company's identity, leads to its stable growth. The authors present the results of a survey conducted in a mining company with the use of the Organizational Culture Assessment Instrument (OCAI) developed by Kim Cameron and Robert Quinn. Based on this example it is possible to suppose that mining companies do not have a dominant type of culture but two of these types (market and hierarchy) are stronger than others because of conditions in which they operate (e.g. law regulations, normalization). First of all, however, the key organisation values in mining are focused on stability and control - safety, people, responsibility and trust. The relations between values and efficiency presented in the article, suggest that MBV can be a good method in long term management that is oriented on the value of the organisation's economic growth.

6. **POLISH MINING INDUSTRY TODAY**, Prof. D.Sc Monika Hardigora, Ph. D, Wrocław University of Technology, Wrocław, President of KGHM CUPRUM Ltd. R&D Centre, Wrocław, Poland



She has been a full professor since 1997 at the Faculty of Geoenvironment, Mining and Geology, Wrocław University of Technology, Wrocław, Poland and President of KGHM CUPRUM Ltd. R&D Centre, Wrocław from March 2009.

Education and qualifications: She got MSc in mining – Mining Faculty, Wrocław University of Technology, PhD – Mining Institute, Wrocław University of Technology, DSc– Technical Sciences Faculty, Technical University in Freiberg, Germany

She obtained the professor position of technical sciences, title given by the President of Poland on the base of the application of the Board of Mining Faculty of AGH University of Science and Technology. Since 2006 she has been a manager of accredited Laboratory of Conveyor Transport, Wrocław University of Technology.

Former positions:

1995-2002, Manager of Machine Systems Department, Mining Institute, Wrocław University of Technology,

1993-1996, Director of Mining Institute, Wrocław University of Technology

1996-2002, Dean of Mining Institute, Wrocław University of Technology

2002-2005, Proxy of Dean for Scientific Staff Training and Foreign Co-operation

1997-2006, Chairman of the Group IV for Prime Minister Awards for outstanding scientific and technical achievements

2005- 2008, Vice-rector for Development of Wrocław University of Technology.

She is member of several scientific boards of Polish and foreign magazines and also member of scientific committees of a few dozen of national and foreign conferences, membership in scientific and professional societies. From 1999 she has been a member of Mining Committee of Polish Academy of Sciences and from 2007 part of the Presidium of Mining Committee, Polish Academy of Sciences. From 1996 she has been member of the Society of Mining Professors, in 2012 she was President of Society of Mining Professors.

Teaching experience: Lectures on transport systems, mining transport and the basis of underground and open pit mining, mining mechanisation, mining industry in the world, Over 80 M.A. thesis, 5 finished PhD courses. Initiator and co-ordinator of the European Educational Programme in the range of geotechnics and environmental protection (EGEC)