



IMRB GERMANY 2015 CONFERENCE PROCEEDINGS

7th IMRB Conference
Hanover, Germany
6 – 10 September 2015





MEET EXPERTS AND FRIENDS

INTERNATIONAL MINES RESCUE BODY CONFERENCE 2015

8 – 9 SEPTEMBER 2015
HERRENHAUSEN CASTLE
HANOVER, GERMANY



IMRB 2015 CONFERENCE



TUESDAY, 8 SEPTEMBER 2015

Conference Room

- 09:00 a.m. Welcome of the Organizers and Conference Opening**
- Welcome Address
Helmut Ehnes
Director Prevention, German Social Accident Insurance Institution for the Raw Materials and Chemical Industry (BG RCI) / Secretary General International Section of the ISSA on Prevention in the Mining Industry (ISSA Mining)
 - Welcome Address
Wolfgang Roehl
Head of Central Mine Rescue Service, Germany / International Mines Rescue Body Conference (IMRB) Chairman / Manager of German Mines Rescue Committee
 - Welcome Address
Regine Kramarek
Mayor of Hanover, Germany
 - Welcome Address
Stefan Dräger
Dräger, Germany

Key Notes

- 09:20 a.m. RAG's Way to „Zero Accidents“**
Peter Schrimpf
Deputy Chairman of the Board RAG Aktiengesellschaft, Germany / Vice President International Section of the ISSA on Prevention in the Mining Industry (ISSA Mining)
- 10:00 a.m. Vision Zero and the Seven Golden Rules – the Global Prevention Strategy of ISSA for Rescue and Beyond**
Helmut Ehnes
Director Prevention, German Social Accident Insurance Institution for the Raw Materials and Chemical Industry (BG RCI) / Secretary General International Section of the ISSA on Prevention in the Mining Industry (ISSA Mining)

10:30 a.m.

Coffee Break

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TUESDAY, 8 SEPTEMBER 2015

- 11:00 a.m. Mining and Metal Material Risk Management:
The progress, Focus, Success, Challenges and Way Forward**
Hannes Struyweg, Director Health and Safety International Council on Mining & Metals (ICMM), UK
- 11:30 a.m. Achievements / Experiences and Challenges for OSH in Mining in Latin America**
Roberto Morrison, Soletanche Bachy Chile S. A., Chile
- 12:00 a.m. A Look beyond the Garden Gate:
New Solutions for Rescue in Offshore Windenergy-Fields**
Dr Markus Stuhr, BG Accident Clinic Hamburg, Germany

Exhibition Floor

12:30 p.m.

Lunch Break

Conference Room

- 01:30 p.m. For Miner's Life and Property –
How China Increases Its Capability to Cope With Mining Emergencies**
Zou Wei Gang, China
- 02:00 p.m. Soma Coal Basin and Mining Operation**
Metin Aktan, Turkey
- 02:30 p.m. Getting Mine Rescuers to the Action Faster and Safer**
Markus Uchtenhagen, Goldcorp Inc, Canada

03.00 p.m.

Coffee Break

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TUESDAY, 8 SEPTEMBER 2015

Presentations in 3 different workshop rooms at the same time

03:45 p.m. Session 1 "Mine Rescue Management System and Effective Operations"

- No. 1.1 Lassing Mine Disaster**
Dr Alfred Maier, Austria
- No. 1.2 Experiences From Exogenous Fire Incident Rescue Operations at 1C Coal- Seams – Trangbach East Area of Dongvong Coal Mine Company in Vietnam**
Pham Van Huyen, Vietnam
- No. 1.3 Mine Re-entry Assessment System (MRAS) – A Decision Makers Tool**
David Carey, Australia

03:45 p.m. Session 2 "Emergency Preparedness"

- No. 2.1 Collegiate Mine Rescue: The Intangible Benefits**
Prof. Jürgen Brune / Lewi Rawling / Alexander Robles, USA
- No. 2.2 Mines Disaster and Mine Rescue Training Courses in Modern Academic Mining Engineering Programmes**
Prof. Helmut Mischo, Germany
- No. 2.3 SCBA Training for Rescue Workers on Tunnel Construction Sites**
Martin Rauscher, Germany

03:45 p.m. Session 3 "Future Trends"

- No. 3.1 Mine Rescue and Command System Base on Panoramas Technology and Three Dimensional Linkage**
Prof. Liu Yongli, China
- No. 3.2 ONE SEVEN Mining, an Innovative System for Firefighting and Prevention in Mining**
Max Stöttner, Germany
- No. 3.3 Development of a Specialised UAV (Unmanned Aerial Vehicle) for „Remote“ Coal Mine Exploration**
Matthew Fellowes, Australia

05:30 p.m.

End of the First Conference Day,
Transfer to the Conference Hotel

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WEDNESDAY, 9 SEPTEMBER 2015

Continuation: Presentations in 3 different workshop rooms at the same time

09:00 a.m. Session 1 "Mine Rescue Management System and Effective Operations"

- No. 1.4 Mutual Aid System – a Multi Jurisdictional Response Between Several Different Companies**
Lex Lovatt, Canada
- No. 1.5 A Framework For Crisis Management at Mine Accidents With a Special Focus on the Prevention of Posttraumatic Stress Disorders**
Dirk Bergmann, Germany
- No. 1.6 Mine Rescue – a New Way**
Wilhelm Schön, Austria

09:00 a.m. Session 2 "Emergency Preparedness"

- No. 2.4 Emergency Preparedness in South Africa**
Christo de Klerk, South Africa
- No. 2.5 Rope Access in German Mines Rescue, Equipment, Devices, Training and Recommendations**
Jens Schulz, Germany
- No. 2.6 Adjusting Mine Rescue to the Requirements of Small Mining Enterprises**
Matthias Kuhn and Dr Walter Hermülheim, Germany

09:00 a.m. Session 3 "Future Trends"

- No. 3.4 Enhancing Mine Rescue Communications**
Phil Carrier, USA
- No. 3.5 Mine Rescue Alert System RAG Deutsche Steinkohle**
Christian Brendenahl and Manuela Asam, Germany
- No. 3.6 Using an Hierarchical Approach for the Dilution of Gases after Gas Outbursts**
Dr Elisabeth Clausen, Germany

10:30 a.m.

Coffee Break

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WEDNESDAY, 9 SEPTEMBER 2015

- 11:00 a.m. Session 1 "Mine Rescue Management System and Effective Operations"**
- No. 1.7 A Comparison Between Traditional Timbers and Rescue Struts for Emergency Ground Control**
Katherine N. Jennings, USA
- No. 1.8 Deployment of a Rescue Team Under NSW Emergency Preparedness and Mines Rescue Guidelines**
Peter Cornford, Australia
- No. 1.9 Modern Escapeway Alternatives**
John Murdoch, Australia
- No. 1.10 Study on Numerical of the Smoke Flow Regulation and its Application during the Roadway Fire Emergency Rescue in Coal Mines**
Dr Wang Kai, China
- 11:00 a.m. Session 2 "Emergency Preparedness"**
- No. 2.7 Emergency Preparedness in Complex Industrial Plants**
Raimund Bücher, Germany
- No. 2.8 Regulation for Romanian Mining Rescue Teams Intervention**
George Artur Găman, Romania
- No. 2.9 Safe Control of Spontaneous Combustion Goaf Fires in Longwall Mining**
Dr Walter Hermülheim, Germany
- 11:00 a.m. Session 3 "Future Trends"**
- No. 3.7 Fire Prevention in Underground Mining – Requirements for Equipment in Germany and Europe**
Christoph Möller, Germany
- No. 3.8 New Zealand Underground Mines Emergency Protocol – a Multi Stakeholder Policy For Managing Underground Mine Emergencies**
Trevor Watts, New Zealand
- No. 3.9 Technical Equipment and Operation of an Underground Refuge Room in the Konrad Mine**
Stefan Schneider, Germany
- No. 3.10 Making Mines Safer: Early Detection of Smouldering Fire on Belt Conveyors and Their Surroundings**
Dr Stephan Großwig, Dr Ulrich Palzer, Andreas Scheid, Germany

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WEDNESDAY, 9 SEPTEMBER 2015

- Exhibition Floor
- 12:30 p.m. Lunch Break**
- Continuation: Presentations in the conference room
- 01:30 p.m. Cave Rescue from Riesending-Höhle**
Rudi Hiebl, Germany
- 01:50 p.m. European Mines Rescue – Research Results of the I² Mine Project**
Felix Lehnen, Germany
- 02:10 p.m. A Polish Perspective: International Mines Rescue Competitions and Their Impact on Safety Development in Underground Mining**
Adam Nowak, Poland
- 02:30 p.m. A Canadian Perspective: Mines Rescue Competitions – A Valuable Evaluation Tool**
Alex Gryska, Canada
- 03:00 p.m. Coffee Break**
- 03:30 p.m. Session Reports, Conclusions, Evaluation of Presentations**
- 04:00 p.m. Closing Ceremony
Concluding Remarks**
Ulrich Meesmann, Germany
- Presentation of the Next Organizing Team from Russia,
Hand-over of the IMRB-Flag to Russian Representatives**
- 04:30 p.m. End of the Last Conference Day
Transfer to the Conference Hotel**

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Words of Welcome to IMRB Conference 2015

Since 1921, as a result of difficult mine rescue operations without any coordination, representatives of the German mining authority, the statutory accident insurance for miners in Germany and trade unions decided to establish and coordinate preventive measures by evaluating mines rescue operations and by providing responsible mine managers with recommendations. Emerged from the former „Prussian Committee for Mines Rescue“ nowadays the “German Mines Rescue Committee“ takes care for mutual assistance among mines nearby, participates in the development of new rescue strategies and rescue device as well and promotes exchange of knowledge referring to emergency management.

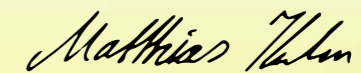
The Prevention Department of the Statutory Accident Insurance for Raw Materials and the Chemical Industry (BG RCI), which is organizing the 7th IMRB Conference 2015, is running four Main Mine Rescue Stations in Germany. Mana-

gers of these four Main Mine Rescue Stations in collaboration and cooperation with experts of the mining authority are basically the source of expertise of the German Mines Rescue Committee.

I congratulate the Prevention Department of BG RCI, especially its Competence Centre for Emergency Preparedness, for the long-term eagerness to promote mines rescue activities and for the willingness to organize such an important and challenging conference worldwide.

Let's have some memorable presentations, interesting discussions and an impressive stay at Hanover.

May this conference will contribute across all national borders to minimize the number and the seriousness of emergencies in the mining section and to ensure fast and effective rescue operations whenever needed.



Matthias Kuhn
(Head of German Mines
Rescue Committee)

Glückauf!

When we warmly welcome you to Germany with the traditional miner's greeting "Glückauf!" we are doing as miners here did for 500 years. Mining looks back on a long tradition in Germany, and is a very safe profession these days. It has not always been like that though. Most people in Germany know of the "Miracle of Lengede", where in 1963 eleven trapped miners have been rescued 14 days after a mine collapse, just 40 miles away from Hanover. Lengede, Copiapó, Soma: whenever evaluating emergency operations we recognize there is one factor all rescue operations have in common: cooperation and the exchange of knowledge and experience are the keys to success. Collaboration will save lives, as it will become clear once more when we will hear of the impressive rescue operation at the Riesending cave a good year ago, almost 1,000 meters below surface and involving more than 700 persons from different nations. The will to collaborate also laid the foundation of the IMRB following the death of six mine rescuers due to heat stress at the Niwka-Modrejow mine in Poland in 1998: understanding and preventing tragedies like this from reoccurring is the aim of the experts united in IMRB.

We are very glad for the opportunity to co-host this year's edition of the IMRB conference as a joint project of BG RCI, ISSA Mining and the IMRB in close cooperation with Dräger. Our aim of the Vision Zero prevention strategy carries a clear message. We assume that a working world can be achieved in which nobody is killed, falls gravely ill or is so seriously injured at work that their health is impaired for the rest of their life. And mine rescue is high risk work. Mine Rescuers are facing collapsed structures or mine workings, falls of ground, rock bursts or subsidence. Explosions and fires. Toxic atmospheres. They rescue from heights and depth. Each mine rescuer needs to know how to manage risks and make good decisions under extremely hazardous circumstances. Mine rescuers save lives, but let us never forget about their own safety and health.

We wish all of you inspiring days here at IMRB 2015, and are very positive that we all will benefit tremendously from the intense exchange of expertise. After all, it is all about life – let us never forget that.

Glückauf!



Theodor Bühlhoff
(President of
ISSA Mining)



Helmut Ehnes
(Director Prevention
of BG RCI)

Secretary General of ISSA
Mining)



Ulrich Meesmann
(Executive Board
Member of BG RCI)

Designated President
of ISSA Mining)



Wolfgang Roehl
(Head of Central
Mine Rescue Service,
Germany)



Dear IMRB Conference Delegates,

On behalf of all the Dräger people and organizations around the world, I would like to extend a warm welcome to you at the International Mines Rescue Body Conference 2015 in Hanover, Germany.

This is the 7th conference organized by the International Mines Rescue Body (IMRB) with the goal to bring mine rescue professionals and volunteers as well as researchers and experts from the field of mine rescue and emergency response together in order to share their expertise and experience. "Meet experts and friends in Germany" is this year's theme of the conference and it strengthens the original idea and the tradition of the IMRB concept.

For more than 110 years since the introduction of the first Dräger Closed Circuit Breathing Apparatus by my forefathers Heinrich Dräger and Bernhard Dräger in 1904, Dräger has been proud to be able to contribute to the development of mine rescue and emergency response. Thanks to your valuable input and the continued dialogues we had with mine rescue brigades and mining related regulatory institutions around the globe, we are able to develop innovative, reliable

safe safety equipment and solutions. One of those solutions you can first witness here in Hanover this week – the Mine Rescue Vehicle.

I am delighted to have the opportunity to attend this conference and meet with you here in Hanover and hopefully later this week in Lübeck. Further I would like to extend my sincere appreciation to the conference organization committee, led by Helmut Ehnés and Wolfgang Roehl, for their commendable efforts in staging this important international event. Dräger's role is to support the IMRB to organize the conference, but it is truly your conference and it is your participation that makes it worthwhile attending. I hope all delegates will be able to take advantage of this platform, meet experts and friends and help to further increase the safety level in mining.

Finally I wish the IMRB conference 2015 in Germany every success and all the participants a fruitful and enlightened experience at the Conference.

Thank you for being part of the IMRB Conference 2015!

Best regards,

Stefan Dräger
Dräger Safety AG & Co. KGaA
(Chairman of the Board)

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MODERN ESCAPEWAY ALTERNATIVES

Abstract

The requirement for secondary egress from producing areas of underground mines has been mandated in most jurisdictions around the world for decades. The requirement to have a second way out of a working area in case of a fall of ground or other emergency involving entrapment is very much entrained in the way underground mines work.

In recent years there have been developments in the types of ladders that are used in hard rock mines and as mines become more mechanised and deeper the lengths of these escapeways increase. At the same time industry acceptance of risk has reduced and this has meant higher quality systems need to be applied and mechanisms for enhancing the chance of survival are becoming more complex.

In underground coal mines the application of self escape through long drifts using caches of oxygen generating re-breathers is being identified as a risk that needs to be addressed. There is an urgent need for underground coal mines to reconsider what is an acceptable system of egress from the producing areas of their operations.

Body

Safescape is an Australian company that was started in 2010 to develop, manufacture, market and install a new type of escapeway invented by the author. Safescape Laddertube escapeways provide significant benefits over conventional steel or timber ladderways. They are safer and faster to install, easier and safer to use and they do not corrode or rot with time and exposure to mine water and atmosphere.

In the 5 years since Safescape started

Laddertube escapeways have been installed at 60 mines in 6 countries around the world. The use of Safescape ladders has enabled the widespread adoption of static line fall arrest systems within escapeway ladders, something that has traditionally been difficult due to the exposed nature of alternative ladders. Safescape has adopted and modified a climb assist technology from the wind power industry which enables climbers to ascend or descend long ladderways with ease. The climb assist system used by Safescape is the IBEX 2000 by PowerClimberWind.

With this new system a moderately fit miner can climb a 400m vertical ladder in 20 minutes without experiencing over-exertion. The system works by effectively reducing the climbers' weight by as much as 55kg.

Safescape has developed a concept model which utilises both climb assist and fire resistant anti-static materials to enable application of vertical or sub-vertical escapeways to be used within a coal mining operation as secondary egress. This means that with very little additional capital infrastructure miners can quickly remove themselves from the mining environment in the event of an emergency, via a blast proof vent door and into a fresh air escapeway shaft.

Conclusion

By application of new technologies alongside conventional systems it is possible to not only enhance the chances of survival in an emergency but also reduce overall costs to the mining operation. Safescape is an example of a company working towards this goal for the benefit of miners around the globe.

NOTES



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FOR MINERS' LIFE AND PROPERTY –

HOW CHINA INCREASES ITS CAPABILITY TO COPE WITH MINING EMERGENCIES

The Chinese government attaches great importance to emergency response capability during mine emergencies. It views this capability as an essential element of governance, and integrates this capability into the modernization of governance system. To improve the mining enterprises' emergency response capability, China's central government takes the following measures.

Firstly, it requests local governments and mining enterprises to abide by the bottom line of "development should never be achieved at the expense of human lives". Moreover, China's government requires that first priority should be given to the safety of miners and their property.

Secondly, it establishes a five-level hierarchy to allocate responsibilities among province, city, county, township and village. Through this hierarchy, the central government strengthens the emergency response functions of local governments at all levels, and urges mining enterprises to take main responsibilities for improving emergency management as stipulated in Law of the People's Republic of China on Work Safety and the departmental rule entitled Nine

Clauses of Emergency Management in Enterprises.

Thirdly, it allocates major resources to build national, local and mine enterprise emergency rescue teams, taking in professional and part-time elements that complement one another. Such teams form a solid basis for emergency rescue operations.

Fourthly, it adheres to the principle of "combining emergency preparedness and emergency rescue while focusing mainly on preparedness". It requests continuous improvement of emergency preparedness. It also demands prompt, responsive, coordinated and efficient emergency responses.

Lastly, it persistently streamlines the emergency response system, emphasizes site control during rescue operations, and aims at carrying out the emergency response operations in a scientific, safe, organized and effective way, so as to protect miners' life and property.

(Abstract of paper presented to the International Mines Rescue Body Conference 2015)

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