

# NEWSLETTER

May 2012



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## Dear EFEE members, the presidents voice

Many people associate the beginning of springtime with a starting point for setting new personal and professional impulses as well as for reorienting. As part of this year's EFEE spring assembly which took place on 28 April 2012 in Brussels the federation's Board of EFEE was newly elected. The general meeting's votes had the following results:

Jörg Rennert	President
Johan Gjørdvad	Vice President
Donald Jonson	Past President (automatically)
Alexander Efremovtsev	Member
Igor Kopal	Member
Ricardo Chavez	Member
Heinz Berger	Treasurer

As the federation's newly elected President I would like to thank all members for having placed their confidence in me. It is a great joy and challenge for me to be the EFEE President.

At this point I would like to introduce myself. I was born in 1965, I am married and I have a 12 year old daughter and an 18 year old son. After graduating with a degree in engineer from the TU (Technical University) Dresden.

In 2001 I was elected President of the Deutsche Sprengverband, in the German blasting federation, and I have since then held this position. In 2010 EFEE members elected me to be the EFEE Vice President.



*Part of the newly elected EFEE board and the EFEE secretary.  
From the left, Donald Jonson, Johan F. Gjødvad, Jörg Rennert,  
Alexander Efremovtsev, Roger Holmberg and Igor Kopal.*

On behalf of the EFEE members I would also like to thank the former President Donald Jonson as well as the Secretary General Roger Holmberg and all Board members for their excellent work.

Together with the newly elected Board members our aim will be to continue and expand the federation's successful work.

I am looking forward to continuing the successful cooperation with you, and is very interested to receive your ideas and suggestions.

Future Meetings EFEE dates and places: Autumn 2012, October 26-27 Disneyland, Paris. Spring 2013, April 26-27, Amsterdam.

*Jörg Rennert, President of EFEE*

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## Update from the past president

First I like to welcome two new company members Spetskhimprom from Russia and INCD INSEMEX from Romania as you can read more about in this newsletter. Totally we are now 25 National members, 17 Company members and 53 Individual members and growing continuously. Our 6th World Conference on Explosives and Blasting in Lisbon was a great success and contributed with many interesting papers, workshop and valuable meetings with exhibitors and colleagues. It ended also up in a good economy which is an important part of our existence so we can drive our mission further to make our world more safe and environment-friendly by spreading out our experience and knowledge to each other.



*Signing an agreement of sponsorship between EFEE and ISEE.*

Next Conference will be in Moscow next year and the planning is on-going to follow up last year's success. During my presidency I had a meeting with ISEE in Nashville to sign a sponsorship agreement between EFEE and ISEE.

It was an agreement between me and Ron Elliot the ISEE President with indulgence of the new Executive Director Winston Forde (right) and the Interim Executive Director Tom Watts.

The aim of the agreement is to promote EFEE and ISEE properly on our individual conferences so we get them announced and spread to so many delegates as possible in the world.

In March 2012 an EFEE Board meeting was held in Stockholm, during the board meeting part of the new Environmental Committee made a visit to the Northern Link project.



*EFEE enviromental committee visiting the Northern Link in Stocholm Sweden March 2012.*

Northern Link is a road tunnel beneath Stockholm City and expresses all challenges which can be fronted when you blasting so close to existing houses, constructions, tunnels and as well living third parties.

Good knowledge of environmental thoughts, safety and blasting handling is of outmost importance in our environmental committee.

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An initiative has been taken in Norway to drive this work "Training manual rock blasting" further in a smaller group with well-educated distributors, consultants and contractors from Norway and Sweden. This work will be presented in next EFEE meetings.

The EU Directive Committee comes also in even larger focus now when we come closer to live up to the practical realization of the track and traceability of explosives for civil uses starting this time next year.

My President period has now come to the end, after two years, and there has been a lot of interesting issues during this time and I am looking forward to follow our work further in coming meetings.

*Donald Jonson, Immediate Past President of EFEE*

## **The EFEE-Newsletter**

In this issue of the Newsletter you can read about:

- The newly elected EFEE board and president.
- An update of the recent events in EFEE, by the immediate past president.
- The EFEE general secretary, honoured with the Swedish "Rock Engineering Award".
- The cities elected to hold the 8<sup>th</sup> and 9<sup>th</sup> EFEE world conference in 2015 and 2017.
- A selected paper from the 6<sup>th</sup> EFEE world conference in Lisbon.
- The challenges during blasting of two smoke stacks in Germany.
- How to win the first EFEE Photo and Video contest.
- The latest update on the EU Directive on Track & Trace of Explosives.
- The first Student Award, which had two winners at the EFEE conference in Lisbon.
- A selection of upcoming events

We in EFEE hope you will enjoy the present EFEE-Newsletter. The next edition will be published in September 2012. Please feel free to contact the EFEE secretariat in case:

- You have a story you want to bring in the newsletter.
- You have a future event for the next EFEE-newsletter upcoming events list.
- You want to advertise in a future newsletter.

Or any other matter.

*Johan Finsteen Gjørdvad, Chairman of the Newsletter Committee*

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## Roger Holmberg, EFEE's General Secretary honoured with Rock Engineering Award

Atlas Copco's Rock Engineering Award 2011 was granted to Roger Holmberg for his engagement in Swedish Rock Engineering know-how.

The motivation by the Jury reads:

*Roger has contributed, in many ways, to the development of the Rock Excavation Industry, including as a researcher at the Swedish Detonic Research Foundation and later as its President. He was for ten years chairman of the Swedish Rock Construction Committee and together with the legendary scientist Per-Anders Persson he wrote a modern rock blasting bible.*

(N.B. Per-Anders Persson's most famous invention is the Nonel shock tube)

The price sum is 100,000 SEK whereof 80% must be used for public rock engineering research.



*Roger Holmberg*

## The 8<sup>th</sup> and 9<sup>th</sup> EFEE world conference in 2015 and 2017

At the EFEE council meeting in Brussels the 28<sup>th</sup> of April 2012, two contesting member countries where bidding to host the 8<sup>th</sup> EFEE World conference in 2015.

Albert Armangue from France and James Tyler presented a concept where the conference could be held at the Disneyland outside Paris. Ricardo Chavez had been part of the making of the presentation but could unfortunately not participate in the Brussels meeting. Albert Armangue and James Tyler showed a film presenting the event and presented the French proposal to take place in September 2015.

The Dutch Explosives Engineers, through Bernard Vercouteren van den Berge, their Treasurer Han van Limburg and James Tyler presented The Netherlands as the potential host in Amsterdam, NH Conference Centre Leeuwenhorst as the place of the 2015 venue. They proposed that the time for the event would be in October 2015.

The President thanked the Dutch and French groups for their inspiring presentations. The voting resulted in favour for Paris. The Council decided that Paris will be the venue 2015 and Amsterdam will be the venue 2017.

*Johan Finsteen Gjødvad, EFEE*

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## The 6<sup>th</sup> EFEE World Conference on Explosives and Blasting, Lisbon, Portugal

EFEE and the Portuguese Association of Studies and Engineering of Explosives (AP3E) were very proud of arranging this event in 2011 in Portugal, known worldwide not only for its culture and history, but also for its long tradition in the field of blasting in mining and infrastructure projects. Portugal is a significant European minerals producer and remains one of Europe's leading producers of copper, tin and tungsten.

Sunday before the conference a workshop was held. The Workshop was divided into two parts:

**Part 1: "New EU-directives 2008/43 and a system for the identification and traceability of explosives for civil uses"** where Predrag Šinik (EFEE Chairman for the committee EU-directives) presented "Status of New EU-Directives" and where Thomas Menzel and Jörg Rennert (EFEE Vice President) discussed "Possibilities for the practical realization of the EU DIRECTIVE 2008/43/EC based on software solution by Dresden Informatik GmbH"



*Predrag Šinik, Thomas Menzel and Jörg Rennert*

**Part 2: "How to handle and solve vibration, noise disturbances in urban tunnelling projects"** where Sven-Erik Johansson made a presentation "Stockholm City Line - A Blasting Challenge" and where Ulf Lichte presented "The demolition of shelters by controlled blasting in city areas - requirements of the vibration monitoring".

Questions and discussions followed the interesting presentations.

16 EFEE Members and 39 Non-members participated in the Workshop.

The conference had 329 (50 EFEE members) participants from 51 countries. There were 225 conference delegates. The total number of Exhibitors were 39 and with 104 participants.

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## Exhibitors

3G Software & Measurement	Kirilogu	Rockmate
AEL	Lubrizol	Sigicom
Austin Powder	Maxam	Soft Blast
Baroda packaging	MDL	Split Engineering
Datum Monitoring Services Ltd.	MREL	TBT-DNA Blast Software
Davey Bickford	Nitroerg	Tipper Tie
EFEE	Nitromak	TLC Engineering Solutions
Expancel	Nomis	Tradestar
Experse	Normet	Tread
Frans Vermeë	Orica	Valeron
Instantel	Poly Clip	White Industrial Seismology
ISKRA	Potters Europé	Vibraquipo SLU
ISEE	Pulsar Measuring System	Xiaojin

At the opening of the conference Donald Jonson, EFEE President, welcomed all and made a review of the EFEE organisation and on-going work. The Portuguese Deputy General Director Carlos Caxaria from the General Direction of Energy and Geology gave an overview of principal blasting works running in Portugal. Ron Elliot, International President ISEE, gave a short speech of ISEE and greeted the conference delegates and finally, Amalendu Sinha, Director, Central Institute of Mining & Fuel Research, Dhanbad informed about the upcoming Fragblast 10 conference and welcomed all to New Delhi in November 2012.



42 interesting papers were approved for presentation by the Technical Committee and the delegates received a paper copy and a CD of the Proceedings.

EU-Commissioner Mike Schmahl, responsible for the Directives and working groups on explosives, pyrotechnic articles and good laboratory practice, as well as for international environmental policy questions, presented the status of New EU-Directives.

*EU-Commissioner Mike Schmahl*



*Ana Rita Farinha*

The Student Award winners were;

**Ana Rita Farinha, Portugal** for her paper:

***“Explosive Densification of Nanometric Powders”***

and

**Viktor Zhulikov, Russia** for his paper:

***“Mathematic Model and Software for the Design of Blasting”***

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*The Russian Conference Committee and the EFEE Board and Conference Committee met in Lisbon and discussed the upcoming conference in Moscow*

The gala dinner was held at Casal De Paulos located in the Natural Park of Monsanto about 15 min. from Corinthia hotel. A variety of entertainment including folklore dancing and fireworks was provided to the participants as well as an introduction of the **7<sup>th</sup> EFEE World Conference on Explosives and Blasting** to be held in Moscow September 15-17, 2013.



*José Gois (EFEE/AP3E) and Tanya Gjødvad at the gala dinner*



*Donald Jonson (EFEE President) and Walter Werner (EFEE/Finance & Audit) in financial discussions at the gala dinner*

EFEE likes to see all of you at the **The 7<sup>th</sup> EFEE World Conference on Explosives and Blasting in Moscow, RUSSIA, September 15-17, 2013!**

*Roger Holmberg, EFEE*

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## Selected paper from the 6<sup>th</sup> EFEE Conference, Lisbon

A paper from the EFEE conference in Lisbon “Improved blast results from the implementation of a business intelligence system” by Ewan Sellers et al. has been selected for publishing in the Newsletter. The full paper is presented in Annex 1.

*Ewan Sellers<sup>1</sup>, Mauritz Kotze<sup>1</sup>, Luis Valentim<sup>2</sup>, Martin Muller  
IAEL Mining Services, PO Modderfontein, 1645, South Africa  
2TLC Engineering Solutions, Bryanston, South Africa  
3SEESPEC Information Technologies, Cresta, South Africa*

### ABSTRACT

A business intelligence system has been developed within an explosive company to monitor the blasting process and track the layout of the blast, and other parameters such as drilling accuracy, redrilling attempts, charging of the holes and stemming by linking blast design software into decision support systems using open source Enterprise Information Integration and Business Intelligence software. Handheld computers collect real time data at the points of interaction, i.e. the blaster and the explosive mobile manufacturing units, and transmit this via mine wide wireless networks to a mine control room where it is correlated with the designs in the blast planning software. Increased productivity is achieved by providing the explosive truck with the GPS coordinates of each hole and the relevant explosive mass. The system is described and the benefits, which include increased productivity, improved fragmentation, prevention of fly rock, quick identification of uncharged holes and predictability of supply times, due to better consistency of drilling and charging are explained using case studies where the knowledge of the actual on-bench information has contributed to significant benefits to both the explosive company and the mines.

## Challenging demolition by blasting of two smokestacks

*Planning: Dr. Rainer Melzer, Dresden. Demolition and blast contractor: TVF, Luebbenau.  
Inspection: Martin Hopfe, Kaulsdorf. Photos: Michael Boehme, Leipzig.*

Normally it is not worth reporting about a blast of two smokestacks with height of only 99 m. However the two chimneys of a former gas powered electrical station near the “Luther town” Wittenberg (East Germany) had several openings for the fumes.

In the middle of the planned tilting direction runs a mid-tension electrical cable and at the rear side an important water pipe.

The blast mouth was installed on a level of 15–17 m. A second level between 1.6 m and 3.6 m on the rear side was initiated with 1 second delay.

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*Demolition by blasting of two smokestacks near "Luther town" Germany*

The blast operation was very successful. The chimneys, blasted with a few seconds difference, fell as planned on their impact beds.

*Walter Werner, EFEE*

## **Photo/Video contest**

Now you can win free access to the gala dinner on the next EFEE conference.



Do you have a unique picture or video connected to the use of explosives. If you have the picture or the movie clip which you believe is good enough to win the competition, you could be one of the lucky winners of a free access to the gala dinner on the next EFEE conference in Moscow 2013.

Send your contribution to our secretariat on [info@efee.eu](mailto:info@efee.eu), before the 1 of August 2012. The winners will be announced in the next EFEE Newsletter.

By entering the competition, you allow EFEE to store and use the films and pictures in our work, Newsletter, homepage and other EFEE media.

*Johan Finsteen Gjødvad, EFEE*

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## Update on EU Directive on Track & Trace of Explosives

On 22 February 2012 Directive 2012/4/EU was adopted setting up, pursuant to Council Directive 93/15/EEC, a system for the identification and traceability of explosives for civil uses.

The most significant differences between the previous Directive 2008/43/EC and the Directive 2012/4/EU are:

- One year extension of the introduction date of the labeling (identification) process for explosives for civil uses. Manufacturers and importers have to label all articles which are mentioned in Council Directive 93/15/EEC as of 5 April 2013, i.e. all products manufactured after that date must be marked. This permits the reverse conclusion that the directive does not demand to label articles which are not mentioned in Council Directive 93/15/EEC, e.g. shock tubes.
- The requirement for data collection and (10 years) record keeping within the supply chain (manufacturers, dealers, distributors, end-users) has been postponed by 3 years to 5 April 2015. This fact is very important for the end-users, the blasting companies.
- Old stocks of explosives in manufacturers' inventories have to be marked / labeled and documented as of 5 April 2015.
- On certain articles, affixing a unique identification is technically impossible due to their shape or design. Furthermore certain articles are too small to affix the code of the manufacturing site and the electronically readable information (e.g. the diameter of the article is or is smaller than 8,5mm). In those cases, the required identification should be affixed on each smallest packaging unit.
- Certain articles (safety fuses, fuses, cap primers) have been exempted from the Directive.
- Member States shall adopt and publish, by 4 April 2012 at the latest, the laws, regulations and administrative provisions necessary to comply with this Directive. They shall apply those provisions from 5 April 2013. This time gap is very short for a legal process which has to pass through ministries, notified bodies and parliaments. So the responsible authorities must find suitable way to continue this process

### Information about the FEEM Meeting on the 09<sup>th</sup> of February in Prague

On 9 February 2012 FEEM has held a workshop in Prague in order to consider an alternative proposal to the use of AI61 & AI 62 within the FEEM European Explosives Code structure. EFEE was also involved in this meeting. So it was possible to represent the view of EFEE according to these facts. In advance of the meeting EFEE send out an E-Mail to the national members with some question about the ways of distribution of explosives. The answers were presented during the meeting in Prague. The possibility to use AI61 & AI 62 for logistical information is important for distributors and re-packers and helpful to define packaging levels (Items, Inner packaging, Intermediate packaging, Outer packaging, Pallet, Container). The XML electronic file transfer format between the supply chain participants (manufacturers, distributors, end-users) was also being discussed. It would be preferable for the industry, distributors and end-users in the quarry and mining industry to have a standard XML file format. FEEM is going to suggest a standard that all companies can develop from.

*Jörg Rennert, EFEE*

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## Student award

For the first time since its foundation, EFEE had conducted a student competition with aim to award graduate students from EFEE national member countries for writing scientific papers. The basic criteria for selection were:

- Academic merits or similar;
- Qualifications and previous experience in the field of Explosive and Blasting Technique;
- Actuality of the article submitted to the Conference.

An important condition for participating in the competition was to present the paper during the 6<sup>th</sup> EFEE Conference in Lisbon.

Four students submitted papers for the competition.

Ms. Ana Rita Farinha, a PhD student in Mechanical Engineering at the University of Coimbra, Portugal and Mr Viktor Zulickov, a 5<sup>th</sup> year student at the Moscow State Mining University in the Russian Federation received the EFEE Student Award 2011, for the papers “Explosive densification of nanometric powders” and “Mathematical model and software for the design of blasting”, respectively.

Ana Rita Farinha presented the paper at the 6<sup>th</sup> EFEE Conference in Lisbon. However, both papers are included in the Conference proceedings.



*Ana Rita Farinha presentation at EFEE Conference in Lisbon*

## Top mining-engineering schools in the world

Michigan Technological University (USA)	<ul style="list-style-type: none"><li>- The Mining Engineering Graduate Program is overseen by a group of faculty from throughout the University; the Program is administered through the Department of Geological and Mining Engineering and Sciences.</li><li>- The MS degree program in mining engineering can provide either a general, in-depth education without specialization or advanced training in either mine planning and economics, geostatistics, rock mechanics, rock fragmentation, solution mining, materials handling, or mine health and safety.</li></ul>
McGill University (Canada)	<p>The University's Mining Engineering Program is the oldest in Canada and has had the highest reputation for excellence. Graduates of the program are found in top management positions of many Canadian mining companies.</p> <ul style="list-style-type: none"><li>- Graduate programs leading to MEng, MSc and PhD research degrees are available in different areas of mining engineering, including strategic mine planning, mine optimization, orebody modeling, stochastic models and risk analysis in mine valuation, etc</li></ul>
The University of New South Wales (Australia)	<ul style="list-style-type: none"><li>- The Mining Engineering undergraduate program is offered on a full-time basis at the Kensington campus in Sydney. It requires four years of full-time on-campus study.</li><li>- The program has one of the largest numbers of undergraduate students studying mining engineering in the Western World. It is recognised by the Minerals Council of Australia as one of the three best programs on offer in Australia.</li></ul>
University of Exeter (UK)	<ul style="list-style-type: none"><li>- The BEng Mining Engineering degree program provides the knowledge and understanding of geology, rock mechanics, engineering design, economics, surveying, management and associated practical skills that will enable students to make a valuable contribution to their career.</li><li>- The University of Exeter is featured in the list of the top 1 per cent of universities in the world according to The Times Higher Education World Rankings 2010</li></ul>
Curtin University of	<ul style="list-style-type: none"><li>- The Master of Science (Mining Geology) degree is designed to appeal to the working</li></ul>

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Technology (Australia)	<p>geologist or recent graduate wishing to consolidate their professional qualifications in the mining industry.</p> <ul style="list-style-type: none"> <li>- This course is one year full-time or equivalent part-time study</li> <li>- Curtin is one of only 17 Australian universities ranked in the Academic Ranking of World Universities 2009.</li> </ul>
University of Southampton (UK)	<ul style="list-style-type: none"> <li>- It offers the Master of Geology degree which allows students to develop an extensive and in-depth coverage of all of the fundamental aspects of cutting-edge geology. The program is accredited by The Geological Society of London from the 2006 student cohort intake for a period of 6 years.</li> <li>- Upon successful completion of the four-year degree candidates will be able to enter a PhD programme without either an initial MSc or MRes qualification.</li> <li>- Southampton is ranked 6th in the UK for Geology by the Times Good University Guide 2010.</li> </ul>
University of Lausanne (Switzerland)	<ul style="list-style-type: none"> <li>- The Master of Sciences in Geology offers students advanced teaching in various specialised areas of geology depending on the chosen orientation.</li> <li>- The University is ranked 6th in Switzerland and 168th among the global top 200 institutions by QS World University Rankings™ (2009).</li> </ul>
Queens College, City University of New York (US)	<ul style="list-style-type: none"> <li>- The School of Earth and Environmental Sciences offers a Master of Arts degree in Geological and Environmental Sciences, and a Master of Science degree in Applied Environmental Geoscience.</li> <li>- The college is accredited by the State of New York and the Middle States Association of Colleges and Secondary Schools.</li> </ul>
University of Otago (New Zealand)	<ul style="list-style-type: none"> <li>- Otago offers the Master of Science in a number of geological areas: Master of Science (MSc) in Geology; MSc in Geophysics; MSc in Marine Science.</li> <li>- The research facilities available in the department cover a wide range of areas including geochemical analysis, geophysics, mineralogy and petrology, etc</li> </ul>
Virginia Polytechnic Institute and State University (Virginia Tech)	<ul style="list-style-type: none"> <li>- Virginia Tech's Geotechnical Engineering Program offers studies in diverse areas including foundation engineering, landslide stabilization, environmental geotechnics, soil-structure interaction, earthquake engineering, engineering seismology, visualization, ground improvement, computational geomechanics, etc.</li> <li>- The Charles E. Via, Jr. Department of Civil and Environmental Engineering at Virginia Tech has been ranked in the top 10 accredited civil and environmental engineering departments by the US News and World Report survey.</li> </ul>
University of California, Berkeley	<ul style="list-style-type: none"> <li>- UC Berkeley's GeoEngineering program offers graduate studies in Geotechnical and Geoenvironmental Engineering.</li> <li>- The program in Geotechnical and Geoenvironmental Engineering provides a broad, integrated, state of the art course of studies to prepare graduates for leadership roles in practice and research.</li> <li>- UC Berkeley's College of Engineering is rated third among the top schools nationwide, following MIT and Stanford (2010 U.S. News &amp; World Report graduate rankings).</li> </ul>
The University of Texas, Austin	<ul style="list-style-type: none"> <li>- The Department of Civil, Architectural and Environmental Engineering offers one of the best graduate programs in geotechnical engineering in the United States.</li> <li>- The program is designed to offer a broad range of activities, with a solid basis in the core areas of geotechnical engineering and opportunities for candidates to participate in research at the forefront of developments in the field.</li> </ul>
University of Idaho (UI)	<ul style="list-style-type: none"> <li>- A student specializing in geotechnical engineering in the Department of Civil Engineering can work toward the degrees of Master of Science, Master of Engineering, or Doctor of Philosophy.</li> <li>- In the Department of Geology and Geological Engineering, the student may work towards the degree of Master of Science.</li> <li>- UI engineering students have historically scored higher than the national university average on the Fundamentals of Engineering national board examination.</li> </ul>

A list with more educational institutions primary in Europe is given in Annex 2.

*Jose Gois, EFEE*

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## New EFEE members

*EFEE likes to welcome the following Members who have recently joined EFEE.*

### *Company Members*

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#### **SPETSKHIMPROM**

Spetskhimprom is a Russian company in operation since 2008. The company specializes in: conducting of explosives trials; instrumental gauging: noise, vibration, air blast, static electricity, seismic parameters, velocity of detonation; certification of Hazardous Production Facilities and their production equipment with regards to safety; certification of equipment for transportation or charging of explosives; certification of explosives with regards to safety according to Russian legislation; building of emulsion explosives plants.

The company provides services to such global companies as Orica Mining Services and MAXAM. Spetskhimprom manufactures, transports and sells industrial emulsion explosives for open-pit and underground mining. Spetskhimprom has all necessary equipment for the blasting operations and have several contracts with Russian and CIS mining companies.

**INCD INSEMEX** – National Institute for Research and Development in Mine Safety and Protection to Explosion – Romania.

*Mission* - Scientific research and specialized services in safety and occupational health and environmental in profitable conditions for: people, industry and environment.

*Main research areas* - According to national RDI strategy and integration in Europe, the strategic guidelines for increasing the capacity, competitiveness and quality of RDI activities, namely increasing the impact sustainable economic and social development, the institute made basic research, applied, technological development and transfer technology for the following directions: security of mineral resources; explosion protection; security of equipment and facilities; explosive and toxic environments; environmental protection; explosion-risk industries; explosives and blasting techniques; mining rescue toxic/explosive environments; human resources; mining and industrial ventilation; classification of mining operations in terms of emanations; technical expertise of the events generated by explosions of combustible and explosive materials.

<http://www.insemex.ro/>

### *Individual Members*

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**Richard Parkin**, BREXCO, UK

**John Butchart**, Hongkong

**Ciaran McCann**, Rocklift Ltd., UK

**Ana-Lucia Limbrick**, AnaMedia, UK

### *Student Members,*

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**Claudio Migliorini**, Università di Pisa, Italy

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## **WE DELIVER FOR YOU ... ANYWHERE**

### **EXPLOSIVES - HIGH PRIORITY EQUIPMENT**

Phoenix Air Group, Inc. owns and operates three different size aircraft and offers price ranges to move your explosives, hazardous materials and high priority equipment anywhere in the world ... on your schedule and within your budget.

Phoenix Air is headquartered just outside Atlanta, Georgia U.S.A. and is licensed by the U.S. Department of Transportation (DOT) and U.S. Federal Aviation Administration (FAA) to transport by air all Hazard Class 1.1, 1.2, 1.3, 1.4, 1.5 and 1.6 explosives in our all-cargo fleet of aircraft. This includes explosives that are forbidden for air transport under ICAO and IATA regulations.

In operation for over 25 years, Phoenix Air is well known by most Dangerous Goods Offices and Civil Aviation Administrations around the world for our work transporting explosives and other types of sensitive cargo. While Phoenix Air does hold dangerous goods authority in a number of countries outside the United States, almost all governments accept Phoenix Air's U.S. Department of Transportation Special Permit DOT-SP-8826 as a basis for issuing Phoenix Air permits to overfly and/or land with dangerous goods on board.

Phoenix Air Hazardous Materials Specialists are available 24/7 to work with clients who have an urgent need to transport explosives or other dangerous goods to locations around the world. Whether the cargo is commercial or military in nature, Phoenix Air is highly experienced in the international regulations and requirements governing these types of transports and stands ready to provide a transportation solution when time is of the essence. Phoenix



Air also has a large group of commercial handling agents around the world who are well versed in very specific rules and regulations governing the transport of dangerous goods and they work closely with Phoenix Air specialists to give our clients a seamless movement of their sensitive cargo to anywhere in the world.

Phoenix Air Hazardous Materials Specialists are always available to discuss your transportation requirements, export/import regulations, timing and costs involved. There is no shipment too large or too small, we size the aircraft according to the cargo and budget. Please see our web site for details.

770.387.2000, extension 3 • [www.phoenixair.com](http://www.phoenixair.com)



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## Upcoming events

<b>2012</b>	May 28-30	EUROCK 2012 <a href="http://www.eurock2012.com/">http://www.eurock2012.com/</a>	Stockholm, SWEDEN
	May 18-23	Tunnelling and Underground Space for a global society <a href="http://www.wtc2012.com/">http://www.wtc2012.com/</a>	Bangkok, Thailand
	June 11-14	MASSMIN 2012 - 6th International Conference & Exhibition On Mass Mining <a href="http://www.cim.org/massmin2012/">http://www.cim.org/massmin2012/</a>	Sudbury, Ontario, CANADA
	Sept. 3-4	2nd Annual Drill and Blast Asia 2012 <a href="http://www.drillandblastasia.com">http://www.drillandblastasia.com</a>	Jakarta, Indonesia
	Sept. 24-26	MINExpo INTERNATIONAL® 2012 <a href="http://www.minexpo.com/">http://www.minexpo.com/</a>	Las Vegas, Nevada, USA
	Nov 24-29	FRAGBLAST 10 - 10th International Symposium on Rock Fragmentation by Blasting <a href="http://www.fragblast10.org/">http://www.fragblast10.org/</a>	New Delhi, INDIA
<b>2013</b>	Feb. 10 - 13	ISEE 39 <sup>th</sup> Annual Conference on Explosives and Blasting Technique <a href="http://www.ISEE.org/">http://www.ISEE.org/</a>	Omni Fort Worth Hotel in Fort Worth, Texas USA
	Sept.15-17	The 7 <sup>th</sup> EFEE World Conference on Explosives and Blasting <a href="http://www.EFEE.eu/">http://www.EFEE.eu/</a>	Moscow, RUSSIA

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