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We in EFEE hope you will enjoy the present EFEE-Newsletter. The next edition will be published in March 2015. 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.

Igor Kopal, Chairman of the Newsletter Committee and the Vice President of EFEE

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EFEE Secretariat,
Roger Holmberg Coniston Court Fl8, St Elija Street,
St Julians, STJ1122, MALTA

NEWSLETTER
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Dear EFEE members,, the president's voice

It has been one of the warmest, wettest and longest summers ever in Europe. Now autumn has reached the northern hemisphere and the leaves have fallen of the trees. The northern part of Europe is already experiencing minus degrees, while southern Europe will see rain and low temperatures before long. In due time most of Europe and the high mountains will be covered in snow and father Frost will be ringing in the fourth season. Christmas markets will appear across our continent and trees and houses will be decorated with lights. The end of the present year is running out fast and a new and interesting is approaching step by step.

In this is the last newsletter of the year, we will inform you about current events and developments in the explosives sector and the European Federation of Explosives Engineers itself.
The EFEE council gathered for two important meetings during 2014. First, we met in the spring in Dublin, Ireland, where EFEE's newest national member, Irish Mining and Quarrying Society((IMQS) where hosts for the council meeting. We are happy and proud to have Ireland in our circle of national members. At the same time our past president Jörg Rennert led his last meeting as President and I was elected to become president and overtake the steering from Mr. Rennert. I am thankful for the trust and will do my best to steer EFEE during my mandate.

The second meeting was held in Tallinn, Estonia, where the EFEE supported research and development project ESSEEM II was the main topic. EFEE is glad to be able to support a project which seeks to support and strengthen the education of blasters in Europe, and regard it as one of our main objectives which is of great importance to uphold. We look forward to follow the project in 2015 and beyond.

During the year EFEE has continued the work in supporting authorities and other organisations of the business for the benefit of our field. EFEE has begun implementing our strategy for the future and have had a success in increasing the number of members.

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In the spring of 2015, EFEE's 8th World Conference on Explosives and Blasting will take place from the 26th to the 28th of April in Lyon, France. Second circular is attached to this newsletter and the interest has been great in regards to both abstracts, booth holders and sponsors. The board held its last meeting of 2014 in Lyon, reviewing the spectacular city and the conclusion was that the scenery is set for a great conference. We look forward to see you there. Whilst Lyon lies just around the corner, work is done to prepare for the 2017 conference in Amsterdam, which is the venue for the 9th EFEE world conference.

As you have probably noticed the EFEE newsletter has changed in to a better and more professional layout, we hope you will enjoy the full content and look forward to bring you next edition in prior to the conference in Lyon in April 2015.

Finally I would like to give my sincere thanks to our Federation's partners for their great support and trust. Many of the services that EFEE provides to its members, participation at numerous committees and expert panels, involvement and active contribution to working out European directives and regulations would be impossible without their extensive support. The same goes for our Secretary General Roger Holmberg who is of great importance for the federation.
On behalf of the EFEE Board I wish all members, colleagues and friends of the Federation a fulfilling holiday Season, a peaceful and reflective Christmas with their loved ones as well as a Happy and prosperous 2015.

We are looking forward to see you again at the next Council meeting and General Assembly which will be held prior to EFEE's 8th World Conference on Explosives and Blasting in April 2015 in Lyon France.

Johan Finsteen Gjodvad, President of EFEE

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Optimisation of blasting towards an energy efficient quarry (EE-Quarry)

Abstract: The EE-quarry European project, supported by the European Commission (EE stands for Energy Efficient), develops a new and highly effective modelling and monitoring Energy Management System technique to improve Energy Efficiency and move to a low CO2 emission rate in the mineral industry.

In this frame, EPC-France has been developing and implementing an operational methodology using continuous field measurements and field adaptation methods for blast design. It drives the Drilling and Blasting work, aiming at a more energy efficient and environmentally friendly operation.
Based upon actual local conditions, blast patterns are optimized through a specific hole-by-hole blast design software that allows users to predict subsequent fragmentation, in order to satisfy requirements of downstream operations. The software also calculates total energy inputs and contribution to Greenhouse Effect. Coupled with methodical fieldwork and variable density explosives, it has been leading to a real reduction in energy costs and greenhouse gas emissions.

1. Introduction

The EE-QUARRY project emerges from the necessity to optimise the Energy Efficiency (EE) of the aggregates industry; a very demanding sector which is characterized by high energy consumptions and greenhouse gases (GHG) emissions. Its purpose is to apply a new analysis technique capable to improve EE and to reduce GHG emissions on quarries, through the constant monitoring of every process.
To sum up, the project is focused on the following research areas, related to the non-metallic mineral extraction industry:

- Minimizing the extraction of non-sealable materials by a better definition of the deposit.
- Improving the practical understanding behind the production of fines during blasting.
- Researching the application of the Mine to Mill concept to optimise the production after blasts.
- Identifying the total energy consumption for both the extraction and the processing stage.
- Optimising the production of comminution circuits by the use of field computational simulation methods.
- Proposing and validating a series of compensation measures for the GHG emissions generated during the quarry life cycle.

Within this global quarry project, blast design, as the first link in the chain, has to be optimized in order to satisfy requirements of downstream operations. EPC-France has been developing and implementing an operational methodology using continuous field measurements and field adaptation methods for blast design. It drives the Drilling and Blasting work, aiming at a more energy efficient and environmentally friendly operation.

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Three main components for blast design and implementation have been developed:
1. The reduction of energy consumption on the ground
2. The calculation of the carbon footprint of a blast
3. The prediction of the face movement and of the resultant muckpile shape

The first key-point represents the way to optimize the charging pattern, thus to avoid overconsumption of explosives and to reduce greenhouse gas emissions. By taking into account all the irregularities of the rock-mass and the complex geometry of the bench, it leads to a hole by hole blast design, and then to a fine energy adjustment in order to reach target fragmentation.
The presentation of this methodology would be too long for the frame of this paper, as for the third point. For that reason, we will concentrate on the second point, which represent the calculation of the carbon footprint and the environmental impact.

2. Calculating the carbo footprint of a blast

Quantifying the environmental impact could appear as an abstract practice. Fortunately, a proper methodology can help one to overcome this issue.

2.1. Calculation methodology

In terms of environment, we agreed on the following step-by-step methodology:
- Gathering state-of-the-art on current environmental studies related to the use of civil explosives in quarries; ;
- Carrying a Life Cycle Analysis (LCA) on explosives manufactured by EPC;
- Comparing coherence of the results with existent literature;
- Proposing a relational data model to get theoretical carbon footprint and energy assessments;
- Programing a dynamic calculation module for such assessments on blasts, according to the explosives and machines used to conduct them.

Relatively quickly, it appeared that hardly nothing but a few studies had been conducted on this topic. The corpus was more or less limited to some Australian works (Brent, G.F.) on GHG emissions in the mining industry, and a French environmental mission report (Dernoncourt, J.R.). This report had been written following an internship in one of the drilling and blasting subsidiary of EPC Groupe (*Forage et Minage de l'Ouest*). Very featured, the latter also gave us recent values (2008) on the constitution of gas emitted by the explosives products used in quarries.

By comparing all the values with each other, and also by using data provided by technical ammonium nitrate producers (main constituent of modern civil explosives), we obtained a rather sound database about GHG emissions and energetic consumption of drilling and blasting operations.

As we aimed at programing a calculation module for carbon footprint and energy assessments, it was necessary to quickly organised our work according to computer development standards.

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Thus we drew a relational database model. At this moment, we set the boundaries of the model, thanks to the LCA. Indeed, we had gathered loads of energy consumption and GHG data on things as varied as drill rigs, explosive manufacturing plant, raw material importation, ammonium nitrate (AN) production process, transport, etc... But how further back should we go, and how far should we stop? This is a recurrent question when one works on LCA and carbon footprint assessments. It is essential to conduct the study from a large enough point of view to be relevant; but it is also important to set some boundaries.

We decided to consider these operations: AN production process (European standards), importation of raw materials (including technical AN), manufacturing of explosives, transport to depots, transport from depots to quarries, drilling, and detonation. Since our purpose is mainly to compare different blast scenarios (drilling pattern, explosives types...), we did NOT consider these operations: any production process prior to AN fabrication, fabrication of the means of transport and of the drill rigs, shipping of drill rigs, drill rigs on-field displacement, manufacturing of the packaging used for explosive products, recycling of the aforesaid packaging. One will note that detonation is taken into account only in terms of GHG emissions, since the energy released during the process is the final product of the whole process.

As a basic example, we can now say quite accurately that the production of 1kg of standard ANFO will represent 376g of CO2-e and 6.175 MJ of energy consumption. When detonated, the same kg will emit 340 more grams of CO2-e. To compare, the production of 1kg of AN-less high power booster explosive will represent 1.317kg of CO2-e and 4.175 MJ of energy consumption. But when detonated, the same kg will emit 677 more grams of CO2-e.

With all these data, we could easily program a user-friendly module to add to our blast design suite (EXPERTIR3D).

2.2. EE-Blasting: a calculation software

EXPERTIR3D is an EPC-made blast design suite and it features everything a blast designer needs. We programmed an extra module able to communicate with it and to share data instantly for the current blast being designed. EE-Blasting (see Figure 1 below) requires basic information on distances between the quarry and the closest depot, between the depot and the factory; on the types of trucks used for transport; on the drill rigs used on the quarry; and on the average drilling speed.

It then saves everything in a database and one can now compare as many blast designs as one could imagine. EXPERTIR3D can export automatically all the information needed to assess the current blast beign designed: quantities of explosives, detonators, total drilled length, and the theoretical blasted volume.The results are given in MJ per blasted m3 or per kg of explosivesvnEnergy assessmenttvand in kgCO2-e per blasted m3 or per kg of explosives nCarbon Footprint assessmentt. Once again, thanks to the actual geometry surveyed, and thus the actual blasted volume, the results are very accurate (within the boundaries we fixed before).

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This module and the calculation methodology behind it provide pertinent information on the energy efficiency of the drilling and blasting operations. We can now compare different patterns and/or designs, and try to optimise their environmental and energetic impacts.

But this is not self-sufficient, since the most important thing for a drilling and blasting company is to answer to the needs of the whole production process. And if one can obviously reduce the carbon footprint of his/her blasts by drastically reducing the amount of explosives, the fragmentation (if existent) would be so coarse that hundreds of working hours of hydraulic breaker would be necessary; and the fuel consumption would then reach indecent summits!

It is then essential to combine those environmental data with fragmentation results, looking at the optimization of the downstream operations.

3. Conclusion

We have been able to implement a quick and easy tool to estimate carbon footprint and environmental impact of drilling and blasting operations and to compare different blast designs. This quantification must absolutely be linked to an on-field methodology.

Indeed, an efficient drilling and blasting operation has to take into account the always changing local conditions and inaccuracies. In order to provide representative result parameters for downstream modelling (fragmentation curve), it is required to take into account these local field variations. The proposed blast design and modelling unit is thus linked to an operational methodology based on continuous measurements. The precise blast design on a hole-per-hole basis, which considers each blasthole as a single unit with its geometrical specificity, is the key for a better blast efficiency.

The outputs (fragmentation, muckpile shape) we are able to provide and control, thanks to the different modules we developed, are of a great use to feed modelling and monitoring of the downstream operations. Since its last stage is being reached, the EE-Quarry project is now finishing a "top level model" which will include all the quarry working steps and the interactions between them.

We had the opportunity to test our blasting technique on quarries in different scenarios around Europe. Particularly, one case study in France allowed the consortium of companies and research institutions to share their methods on the ground and to try to quantify the real impact of this entire optimizing project both on environment and energy efficiency. By comparing carbon footprint assessments with different blast design and on-field implementation, and by feeding a Loading and Hauling simulation tool for carbon footprint assessment, we have been able to reduce the environmental impact of both drilling & blasting operations and loading & hauling operations.
By studying the environmental impact of extractive industry on a larger scale, we have been able to ensure that the extra CO2-e emissions engendered by the implementation of blast patterns that lead to greater energy are positively balanced by the carbon savings generated by subsequent operations. This happens only if the energy is used in an optimized, a concentrated way. If the positive economic impact has also been studied, we focused on the environmental aspect.

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Actually, a more sustainable industry can only arise from more optimized and more efficient operations. Hence, blast optimization will then automatically lead to quarry optimization and to a greener industry.

In fact, beyond ameliorating just production process efficiency, this blasting methodology leads to reducing the global carbon footprint of quarry working.

P. De Pasquale & R. Chavez, EPC Groupe

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60 Years' of Service to the Global Explosives Industry
SAFEX then, now and the future

SAFEX then - Celebrating its origins

1953 was an eventful year: Dwight Eisenhower became President of the USA; Joseph Stalin died;; Mt Everest was conquered and Queen Elizabeth II was crowned. Unfortunately, that year also witnessed tragedies such as the North Sea Flood which hit the Netherlands on 31 January 1953 killing 1,853 people. The explosives industry, too, went through a horrid time with 16 major incidents recorded in that year alone resulting in 87 fatalities and 200 injuries.

It was July 1953 when Marcel Niffeler, President of Fabrique Suisse d'Explosifs Dottikon in Switzerland conceived the idea that led to the establishment of SAFEX International the following year. Perhaps he was looking out of his office window deep in thought. It was mid-summer and Switzerland looks beautiful that time of the year. On this day he was unable to enjoy the view as he normally did. He had just been notified of an explosion in his RDX plant. While Dottikon was fortunate there were no serious injuries on this occasion, he had been in the explosives business long enough to know it was only by chance. This was not an isolated incident. He was well aware of the number of bad explosives accidents that had occurred in the previous couple of years. It can't go on like this, he thought; it is bad for the industry and we must do something about it. Can we not prevent the recurrence of such incidents if we learn from each other's experiences, he must have reasoned.

Without further ado he contacted his colleagues at Dynamit Nobel Wien in Austria and Dynamite d'Udine in Italy with the idea of exchanging information on explosives incidents. They readily agreed to his proposal as the harmful effects of unwanted explosions are something that haunts all manufacturers. Other companies got to hear of this initiative and in 1954 SAFEX International was established with 8 companies from 5 different countries. The fundamental message that brought them together and that still drives SAFEX to this day was:

"Establishing this Association is a humanitarian task, a moral and social mission and no effort undertaken for this purpose can be considered too great".

Besides sharing incident information among the members as the events occurred, it was also decided to hold a Congress where members could review and discuss the incidents that had taken place. The first SAFEX Congress took place in Zurich, Switzerland in September 1960. It was attended by 56 delegates from the 25 member companies in 14 countries which at that time were members of SAFEX.

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SAFEX now - Behaving its values

Anyone involved with explosives is well aware of the tragic consequences of an unwanted explosion - manufacturers perhaps more so than most. No one intends such incidents to happen. Yes, explosives are meant to go with a bang as they release their packaged energy but not in an irregular fashion. Explosives are a positive force through which so much development has been possible across the world. However, it was never meant to harm people, property or the environment in such an uncontrolled fashion. How many lives have been disrupted in the space of microseconds by such events; how many hopes and dreams wrecked in the blink of an eye? Yet this is precisely what happens when explosives are initiated in an unwanted fashion. A young family can be left without the breadwinner and father. Another couple on the brink of retirement can be torn apart needlessly; their hope of enjoying the fruits of many years of loyal service lying in the ruins of the plant that had just exploded. Not to speak about the impact on the communities that suffer damage to their property; or the customers who may not receive the products they require for their business. What about the ensuing disruption as the plant is rebuilt and the impact it and lost business may have on the company's fortunes. Then we must not forget the effect such events have on the reputation; not only of the company concerned but the whole of the explosives industry. Regulators are often obliged by public pressure to introduce additional regulations which make it difficult for explosives companies to operate regardless of whether they have been responsible operators in the past.

It is these and other consequences which gave rise to the establishment of SAFEX International 60 years ago. As we have seen, it was the intention of our founding fathers to create a voluntary Association of explosives manufacturers. Its purpose was to share information on any topic that can avoid the occurrence of unwanted explosives incidents with the potential for harm. By exchanging such experiences SAFEX members can protect people and property from hazards and ensuing damage as well as the heartache associated with it.

Therefore, the values to which SAFEX members subscribe can be summarised very succinctly as "*Care and Share*".

May I try and illustrate them in the following diagram.

In keeping with the intention of our founding fathers, only manufacturers of explosives can be members of SAFEX. At this time our membership amounts to 257 member companies. 185 of these are subsidiary companies of the 9 groups that belong to SAFEX. The remaining 72 are independent companies. 49 Countries are represented by our members which illustrates SAFEX's global reach. We are privileged to have the membership we've got and humbled to know they subscribe to the Values that is at the heart of what we do. Let me explain it this way.

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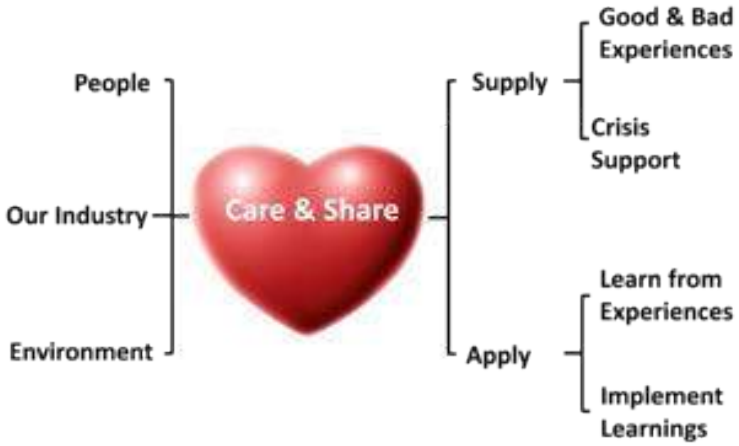
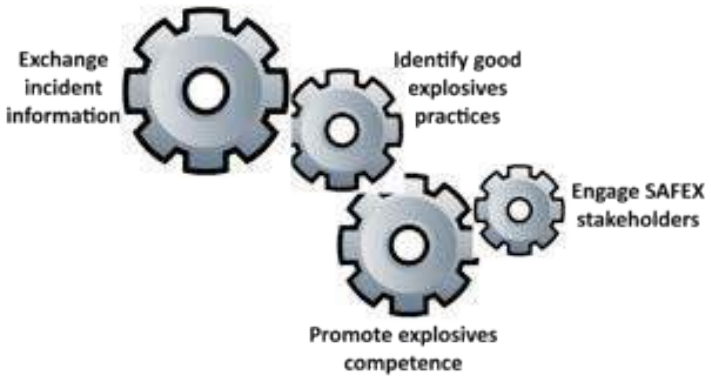


Values are crucial in any organisation as they are the drivers of behaviour. SAFEX is no exception. We are driven by our Care for people, the environment and ultimately our industry's reputation. This is what makes us do what we do.

SAFEX's second value, *Share*, is about how we go about it. We believe in sharing information that will demonstrate our Care; sharing both good and bad experiences with one purpose in mind: to learn from them and so eliminate harm to people, property and our planet (the environment). When a member experiences a crisis as result of a disastrous event, other members will support that member with relevant experiences and help it recover safely from that event. But to Share is more than merely "supplying";; it is also about "applying". Members accept there is an obligation on them to take the information they receive and learn from it. But it must not stop there. SAFEX members are also expected to implement relevant lessons in their operations otherwise that experience is wasted. It was never the intention for the information we receive, often at great cost as we saw earlier, to lie in a filing cabinet or database.

It is all well and good but what does SAFEX actually do? Our work can be outlined in four broad service offerings that build on each other like one gear driving the next as this illustration attempts to show:



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1.**Exchange incident information**. Acquiring and distributing incident information has been the major focus of SAFEX throughout the years. We have seen that sharing information about serious and potentially serious explosives incidents can lead to a better understanding of their causes, how to deal with them and avoid a recurrence of such incidents. This service entails two major elements:

a.)*Incident Reporting*. It is at the core of what SAFEX does. SAFEX relies on Members to report explosives incidents, identify the underlying causes of each incident and highlight the learning points.

b.)*Incident Database*. This Database captures the details of each incident that has been reported. It contains information on more than 900 SAFEX incidents accumulated during the 60 years of our existence. The Database has been augmented with non-member incidents. It means the Database now contains more than 18,000 records.

2. **Identify good explosives practices.** Understanding the underlying causes of incidents helps SAFEX members identify good practices that will either prevent explosives incidents or minimise their consequences. SAFEX has established two ways of helping members access effective explosives practices:

a.)*Specialist Workgroups*. They aim to develop and maintain a document of good explosives practices (GPG's) in each Workgroup's specialist area. At present there are six Workgroups: Emulsion manufacturing safety; Remediation and Decontamination of explosives contaminated facilities; Explosives Transport safety; Good Explosives Practices((GEP); Security of explosives which includes traceability; and technical grade ammonium nitrate (TGAN) handling.

b.)*The Expert Panel*. It comprises individuals who were nominated by members and approved by the Board. Such an individual has been associated with the explosives industry and acquired expertise in a specific field(s). He or she makes this available to SAFEX members on a commercial basis that is agreed between the expert and the member.

3.Promote explosives competence. In line with our Share value SAFEX is passionate about making sure the knowledge we obtain and the practices we develop are applied where it matters. The development of explosives competences is a logical extension to SAFEX's service offering. We want to assist people working in our explosives operations to acquire and implement the knowledge and expertise associated with recognised good practices. Those people can then be expected to operate safely and responsibly This service also comes in two parts:

a.)*Training and Development*. The development of the attitudes and skills that make for competence can only be done in the workplace by the Member concerned. In its Training, SAFEX focuses on the transfer of knowledge, concepts and rules for behavioural change that will improve the performance of employees working with explosives in Member companies.

b.)*Publications.* SAFEX views Publications about recognised good explosives practices as an important way to transfer explosives specific knowledge to its Members. Besides its own publications, SAFEX is also fortunate to make available publications from some of its Associate Members.

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4. Engage SAFEX stakeholders. We regard anyone that can affect or be affected by SAFEX as a stakeholder. SAFEX networks with its internal stakeholders comprising Member companies, Associate Members, such as the EFEE, and members of the Expert Panel. SAFEX also collaborates externally with like-minded organisations and individuals. Important elements of our internal networking efforts are:

a.)*SAFEX Website*. The SAFEX Website contains pages that are dedicated to SAFEX members who can access them with the necessary codes. The restricted pages contain incident information including the SAFEX Database as well as member information. SAFEX encourages members to use the Members Directory to network amongst each other.

b.)*SAFEX Congresses.* Historically our Congresses have been the highlight of the SAFEX calendar. They are organised every 3 years in a different European venue. Europe has been selected for its ease of access by SAFEX Members travelling from different parts of the world. The activities during Congresses take up the best part of a week. The network opportunities offered by the Congresses are vital. Until recently the SAFEX Congresses were closed to non-members. The introduction of an Open Day has extended our ability to collaborate with others outside the SAFEX community.

c.)*SAFEX Newsletters.* They are issued quarterly and distributed to both the SAFEX community and any outsiders who may be interested. What started as a newsletter with items of interest for SAFEX members only has become a journal that tries to cater for a variety of subjects of interest to the explosives industry at large. Readers from within and outside SAFEX are encouraged to contribute articles on any subject in the SAFEX domain i.e. promote the health, safety, security and environmental performance of our industry.

SAFEX in the future - Keeping pace with change

"*The trouble with our times is that the future is not what it used to be*", said Paul Valery, a French critic and poet who lived in the last century. While there is no doubt that the environment in which we will operate in future will be different, some things will be the same. Firstly, the effects of unwanted explosions will be the same. Secondly, if I may be so bold, the principles of safe handling of explosives which have stood us in good stead in the past will still apply. Three areas will be particularly challenging for SAFEX in future as it lies at the heart of what we do. May I emphasise that what follows is a personal view and not necessarily SAFEX's position:

1.Accessing information. SAFEX's lifeblood is the free flow of information related to health, safety, security and environmental responsibility (HSSE). It depends on the ability and commitment of members to share such information. The question is what may inhibit this willingness?

a.)*Increasing litigious environment*. In many jurisdictions members have not been able to share incident information as freely as they may have liked for fear of expensive litigation. In such an environment it's going to require creative solutions to help SAFEX access the learning points necessary to protect our industry.

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b.)*Members' commitment.* Two possible factors could negatively impact this commitment which is at the heart of SAFEX's effectiveness: In the first place the evolution of so-called safe explosives may lead people to question SAFEX's relevance. That these new explosives are safer than their predecessors is a fact. However, the consequences when things do go wrong can be as horrific as before – they are after all explosives. Then there is the restructuring of our industry. This has resulted in the agglomeration of explosives companies into large groups. It has also been accompanied by an increasing number of executive appointments from outside the industry. These executives may not be as aware of the value SAFEX can add to their efforts than those that have been blooded in the industry.

2. Exchanging information. In this respect, two specific opportunities come to mind:

a.)*Getting the information to where it is needed*. Having the best quality of information at hand is to no avail if we don't get it to the people who need it - the folk in the workplace. Furthermore, we need to package it to be used optimally. The new generation of worker has different needs to his predecessors and SAFEX will have to adapt its offerings accordingly. There have been vast developments in digital technology which the Association must exploit to the full in distributing its information. The opportunities for getting SAFEX's messages across using social media must be identified and incorporated in the way we do things.

b. Networking. Whereas the Congress, the website and the Newsletters are the primary networking tools we use at the moment, advances in digital technology can also help us in our networking efforts. It presents us with opportunities of doing more by way of virtual meetings and interactions during the period between Congresses. Our Workgroups' efficiency and effectiveness can also improve with the appropriate use of this technology.

3. Applying the learning. SAFEX's ability to promote explosives competence can only happen in partnership with its members. The areas which could be considered as future training issues include:

a.)*The "What" – training topics.* The agglomeration in our industry to which I referred above has led to the loss of traditional expertise as longer serving employees have been encouraged to retire. Countering this erosion of expertise and experience is already a focus in the training SAFEX offers and will become increasingly so. SAFEX training must continue to teach the fundamentals of good explosives practice as a foundation for companies to build on. Explosives security is becoming a topic that deserves more attention with the increasing use of civil explosives in the development of improvised explosives devices (IED's). In line with its purpose of eliminating harm from unwanted explosives events and given its global reach, SAFEX may have a role in helping members secure their products. It must do so without getting embroiled in politics or partisan positions.

b.)*The "Who" – target audience.* SAFEX's training efforts should also equip leaders at all levels with the basics of explosives management. This will provide them with the confidence they need to enforce the appropriate standards. The appointments to key positions from outside the industry, to which we alluded earlier, may be an area where SAFEX can add value. A second important target audience is Asia, and specifically China, where SAFEX is already hard at work. The e-learning programmes SAFEX is developing can be particularly suitable for coping with the language difficulties it faces in the training it offers.

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c.) *The "How" – training manner.* While face to face training will continue to be an important component of its training efforts, the virtual classroom is an increasing reality. With SAFEX's global membership and the challenges this spread presents in terms of travel, time zone differences and language, the opportunities for virtual training abound. SAFEX is already taking its first baby-steps using this technology but will have to accelerate its efforts and employ a variety of techniques which this medium presents.

Regardless of what the future brings, SAFEX can approach it with confidence as long as it clings to its values and the principles which have been established over the years. With the ongoing commitment of its members and wise leadership, the Association will continue to serve the global explosives industry with the same dedication that has marked the 60 years of its existence. We have a task to perform in eliminating the harm unwanted explosives events cause anywhere and are willing to collaborate with anybody that shares this ideal.

Boet Coetzee , Secretary General of SAFEX

Stockholm City line (Citybanan)

Nitro Consult

The Stockholm City Line (Citybanan) is to be a 6-km double-track underground railway beneath central Stockholm, expressly for commuter trains, which will double the current north-south rail track capacity through the city. Currently under construction at an estimated cost of SEK 16.8 billion (USD 2.4 billion), the project is the biggest investment in the Swedish capital's railways since the Stockholm Metro. Scheduled to open in 2017, it will run mostly through 130 m^2 double-track rock tunnels, which fork into 2 x 80 m2 tunnels at station approaches. Altogether the project will requireaa about 1.5 million m3aofarock to be excavated sensitively by drill-and-blast. The cheme includes aaa parallel service tunnel, two 260-m x 220 m2 under-city stations, two underwater concrete tunnels and a 1.5 km railway bridge.

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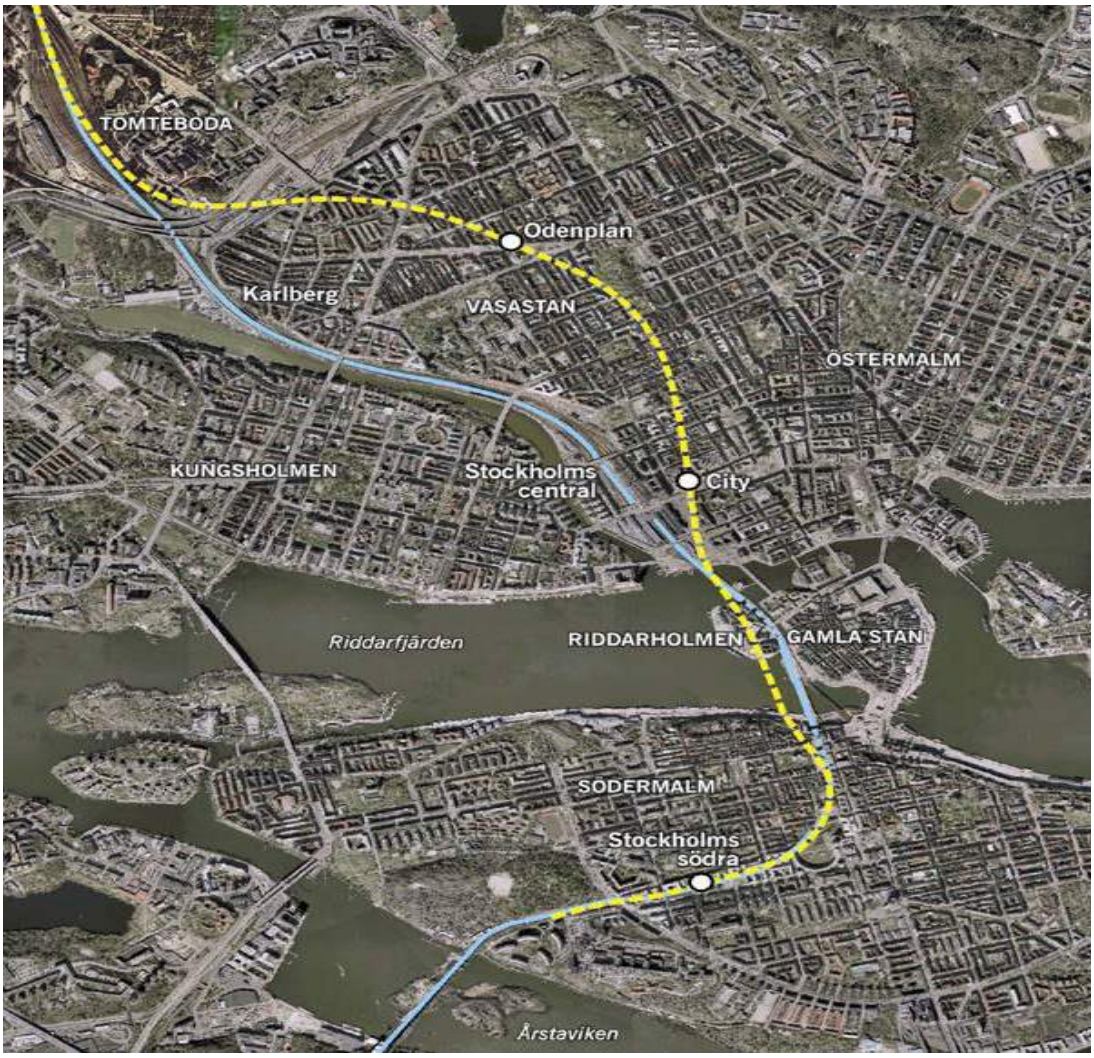
Nitro Consult's role in the project

Nitro Consult has been involved in this project from the outset, starting with ground investigations. We then participated in the design and drafting of construction documents for the rock-excavation work between Tomteboda (the northern portal) and Station Odenplan (beneath the city's Vasastaden district). Additionally, our Vibration Group has carried out a series of test blasts in order to determine the vibration limit-values for vulnerable buildings such as the Gustav Vasa Church at Odenplan, and other sensitive installations. We have also carried out risk analyses of the vibration-generating works along substantial lengths of the prospective tunnels.



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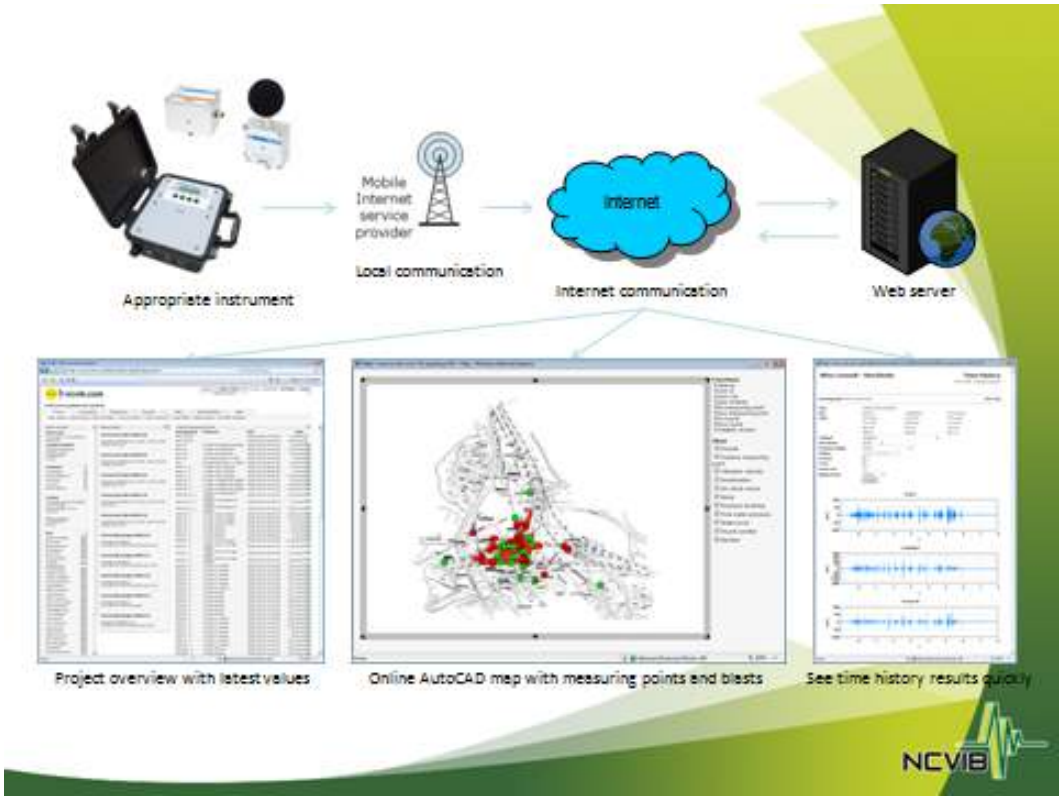
Ongoing engagements

Nitro Consult has measured vibrations, noise and structure-borne sound along the entire northern stretch of the main tunnels from Tomteboda to Station City (the planned main passenger interconnector station underneath the city center) and further to the south side of the city. We are doing this together in a joint venture, NCA, with a firm called Ansvarsbesiktning AB. We also doing house inspections and carrying out structural surveys of all buildings and other facilities within the risk zone of a corridor of 300m before and after the vibration-generating works.

Our assignment includes also the handling of all related questions and enquiries from neighbors and other third parties. Vibration measurements are taken on buildings, equipment and the underground railways. Approximately 100 measuring points are active daily. All measured values are reported to a server via GSM link. The client and contractors can read these measurements continuously via the Nitro Consult NCVIB Web portal. Every morning the contractors post the day's scheduled blasting times in the NCVIB portal. The contractor have continuously to put in the blasting journals in NCVIB and by using the regression analyze tool in NCVIB they have full control of the permit vibration limits and can also optimize their blasting.

Donald Johnson, Nitro Consult



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ESSEEM II - status update

Finally, on the end of august, came the answer for the ESSEEM II grant application. Unfortunately the answer was negative. The project received a lot of compliments from the Estonian Archimedes bureau, which is the representative of Erasmus plus programme in Estonia. The specialists working with the applications appreciated our idea as well as the target we want to achieve and suggested us to apply again with some cutbacks and some changes in the project.

We have presently also received a formal feedback from the Archimedes bureau and we understand now that the main reason for the answer was that we asked too much money for the project. The Estonian bureau had app. 600 000 € available to support Erasmus plus projects (for all 12 applicants). We alone asked for app. 400 000 € in support to our project.

Voglers Eesti, the project manager of ESSEEM II, organized a partners meeting on 12th of September in Tallinn, just a day before the EFEE meeting. The meeting turned out to be very productive, as there were plenty of good ideas and at the same time all the participants wanted to continue with the project and attempt to apply for a another grant again. A proposal was made to carry on to the EFEE shotfire committee.

The proposal was unanimously approved first by the committee and hereafter by the EFEE Council meeting. The proposal included a split of the grant application into two halfs.

Focus should be on preparing the materials to be able to present the first application in February 2015.

When the first application is approved, the project application for the second grant should be written in time to send out in February 2016 – the second application will focus on organizing the education courses based on the materials approved in the first project.

The initial project will include tunnelling, exercises, exams and a guidebook for to carrie out the shot firer education courses in the future. The courses will follow the ECVET framework.
It was also proposed by the Erasmus plus programme specialists that we should add interactive inputs to the materials, to modernise the materials and make it more attractive for the learners.

The project leader, Voglers Eesti, and all the partners from Norway, Germany, Portugal, Czech, France, United Kingdom and Sweden are already working on the new application form. The answer to the grant application is expected in May-June 2015 and the project is expected to start in September 2015

Viive Tuuna, Voglers Eesti

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Shotfirer Certificates

The EFEE Shotfiring Committee is working with the harmonization of the educational requirements for the shotfirer in Europe in order to enhance free mobility.

Educations in the EFEE-participating countries have been systematically analyzed by the committee to understand if their national educations meet the requirements set by EFEE.

EFEE has previously issued more than 300 EFEE Shotfirer Certificates to applicants holding a national shotfirer license from a country which is considered to meet the set EFEE requirements.

At the Council meeting in September 2014 it was decided that the issue of EFEE Shotfirer Certificated should be discontinued. The Shotfirer Committee is however continuing its project to harmonize education in EU to enhance free mobility.

Roger Holmberg, EFEE Secretary General

EFEE network for employment of students

One of the main objective of EFEE is to provide a European forum for professionals working in the field of explosive techniques and explosive industry. Recently we discovered that this EFEE forum can play also useful and important role in employment of students. Let me please briefly describe you one positive example which proves the previous statement. Our present EFEE president Mr Johan Finsteen Gjødvad was contacted by student who was looking for company willing to employ him just for the purpose of his university internship. In short time this information was passed to Mr Ricardo Chavez (present member of EFEE Board) who found the possibility for this student to carry out his university internship. Finally it was EPC subsidiary company in Norway which employed him just for this purpose.

This was only the first and coincidental contribution of EFEE for employment of students. EFEE is fully aware of importance to be attractive for the young generation mainly for the students. We are not only looking for the new members among the students but we also want to create a general base for the employment of students. The target is to have in the future effective institutional system - network for employment of students, which will be on the one hand suitable for the students who are looking for employment opportunities related to their university internship and on the other hand will be also useful for the companies from explosive industry which will employ them for this purpose. This will enable EFEE to attract more students who can only benefit from such a network and bring them to EFEE Company members who can also employ them repeatedly in the future.

Igor Kopal, Vice President of EFEE

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Track and Tracing

The implementation of the EU Directive on Track and Trace of Explosives has got underway. Since 1.5 years all explosives covered by the Directive must be uniquely labelled by the manufacturers or importers. These labels must be attached to the respective objects in a human as well as machine-readable form. As a second stage of implementation, all companies handling explosives must register and record the labelled information. This applies especially to those selling and using explosives i.e. the blasting companies. The deadline for implementing this part of the Directive is 5th April 2015. If blasting companies have not yet taken any measures towards implementing the Directive, it is now high time to tackle this task. The experiences made so far have shown that implementing all requirements made by the Directive forms quite a complex task and requires sufficient time, personnel and financial resources.

Reviewing the first Steps

The leading explosives manufacturers organised in the FEEM took three years of lead time to fulfil their new marking duty on time of the commencement of the EU regulation. In 2010 the complete industry organized itself in task forces and committees who agreed upon the two-dimensional data matrix codes ECC 200 as a FEEM standard. Also TTE-Europe GmbH contributed to that. The industry-neutral company targeted a custom-tailored solution of the track & trace issue in the blasting sector. Since 2012 the TTE software is deployed as internal solution of explosives manufacturers in and beyond Germany. One of the first difficulties that the company had to solve in collaboration with the future users was: the speed and thus the profitability of production were not allowed to shrink due to the application of the new labels. After finding a satisfying answer to the physical labelling, the digital data were given attention. They were supposed to be administrated quickly and easily and later also be transferred in the framework of the second level of the EU directive. Therefore the system was constructed in a way that entire packaging hierarchies can be saved. The information of single items is summarized in small packaging units and these are assigned to a higher packaging unit. For example: all tracking numbers of single detonators are listed in the data for the single outer packaging, which again is part of an entire pallet.

Sample label referring to EU-directive:

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The German blasting association made an analysis for the implementation of the EU-identification directive in 2013. Almost half of all codes, which were produced by the manufacturers, were problematic. 20 to 30 percent of markings didn't accord to the data matrix codes required by the FEEM. Furthermore the coded data was partly erroneous: They were partial incomplete or incorrect. In total only 20 to 25 percent of the tested labels were without errors. This alarmingly result made an impact. Until summer 2014 a lot manufacturers repaired the errors. But unfortunately some non-standard explosives still exist. Main goal of the manufacturers is to remedy defects until the end of this year – just in time to implement the second part of the EU-directive with due date April 2015. Therefore it is important for every party to set up with new hard and software. The ambition of the TTE solution was and is to make the directive achievable for every user with the least possible effort. Regarding this TTE offers besides the required Track and Trace functionalities an electronically stock book to avoid the so far necessary manual paper work. Due to the time saving effect in administration of the stock book, even a practical benefit can be raised from the EU-Directive.

Next steps from 2015

When the EU-directive comes into force for distributors and users of explosives at the 5th of April 2015, they are not only obligated to data collection. Every single item, which shall be used for civil purpose has to be completely traceable over the whole supply chain until its manufacturer, distributor or importer. The data of every single element has to be recorded in time. Afterwards the data has to be stored for minimum of 10 years, protected from any falsification. A special challenge will be the availability of information about origin, position and disposition of the explosives for the responsible authority. Every company has to name a responsible contact person, which is available for the controller at every daytime and every day of a week to give information in a short time period. TTE also regarded this aspect to facilitate the permanent obligation to disclosure.

With the TTE software it only takes one unique temporary access for the authority to check a single tracking number. This access can be closed by the TTE customer at any time. The controller receives herewith no insight in the whole stock book, but the data of the wanted tracking number. Furthermore the online version takes all worries from the user about the safe and long lasting storing of data, due to capture them in a secure data center in Europe. With the login details, the user can access to the program from every computer with internet. This means, in case a computer fail, the access to the software is not disturbed. Alternatively the software can also be installed locally on a computer in the company's intranet. But this solution requires from its user a continuous independent maintenance. TTE can also help here to fulfill the requirements of the EU to repeated testing of the data tracking system.

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Another problem when it comes to introducing the obligation of tracking explosives for end users and traders is that the mentioned XML files have until now not been transmitted coherently across manufacturers. There is no binding consensus in the industry yet on how they are supposed to get from manufacturer to the rest of the supply chain. Most of the transmission forms cause manual efforts to different extents. There are e. g. USB sticks accompanying the delivery. This process causes considerable manual efforts and entails besides other security risks the danger of transmitting viruses to the computer. More security of loss and the access of unauthorized persons is offered by electronic transmissions. The TTE software supports all ways of transmission and is also compatible to track & trace systems of other providers.

To what extent this applies to the solutions of other providers is currently not sure. To enable the simple and secure data transmission across Europe with all suppliers and customers, the TTE-Trustcenter is available as European standard. The TTE-Trustcenter transfers all data into one single system. It is a fully automatic solution that already many big and renowned manufacturers are using. The universal data exchange platform is Europe-widely available and can be used by everyone, as it works independent from producers. The fed in XML files are automatically audited on correspondence to the standard. This way TTE-Trustcenter protects its users from problems in data processing and transmission. Regardless of whether the companies apply TTE products internally, more and more customers decide to profit from the TTE-Trustcenter's stated advantages.

Consider support services

The support before and after purchasing an appropriate solution should equally be taken into account. Especially global acting manufacturers of explosives, but also for bigger internationally present end users of explosives a Europe wide availability of support in the respective language is important. TTE is with its partners available in all countries of the EU as well as in Norway and Switzerland. A wide European partner network enables TTE to provide support in the respective local language and directly in the near area to the customer. This way TTE can offer special service contracts, which guarantee the best possible maintenance and support.

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The TTE partners work closely together with responsible authorities and associations. Especially the successful cooperation of TTE-Europe GmbH with the German Blasting Association when developing the software was of great utility. This collaboration will be strengthened and extended more in the future. Particularly the national blasting associations can best identify how the regulations and conditions for explosives affect the companies in the respective country.

In this way the TTE software can be further optimized and customized to country specific regulations

Jörg Rennert, Member of the Board
Dresdner Sprengschule GmbH

New regulations for coloured marking

We would also like to point your attention to another topic currently being discussed on a European level. The European Commission has published the results of a study on color-coding of explosives in June 2014. Between October 2011 and October 2013 a suggestion for standardizing color-coding of explosives used in the EU was worked out as a project financed by the European Commission. The project's full title is:

RECOMMENDATIONS TOWARD SETTING STANDARDS AND REGULATING THE COLOR-CODING OF EXPLOSIVES AND BLASTING ACCESSORIES

It was worked out be the following institutes:

AID – Stabilimento Rispristini e Recuperi del Munizionamento

I.R.E. – Istituto Ricerche Esplosivitiche

ECA Italia – European Consulting Agency Srl

The project was partly based on the following program initiated by the European Commission:

Prevention of and Fight against Crime Program of the European Union – European Commission – Directorate – General Home Affairs

According to the authors of the project, the goal was to contribute to improving the safety when handling explosives and to contribute to fighting the misuse of explosives.

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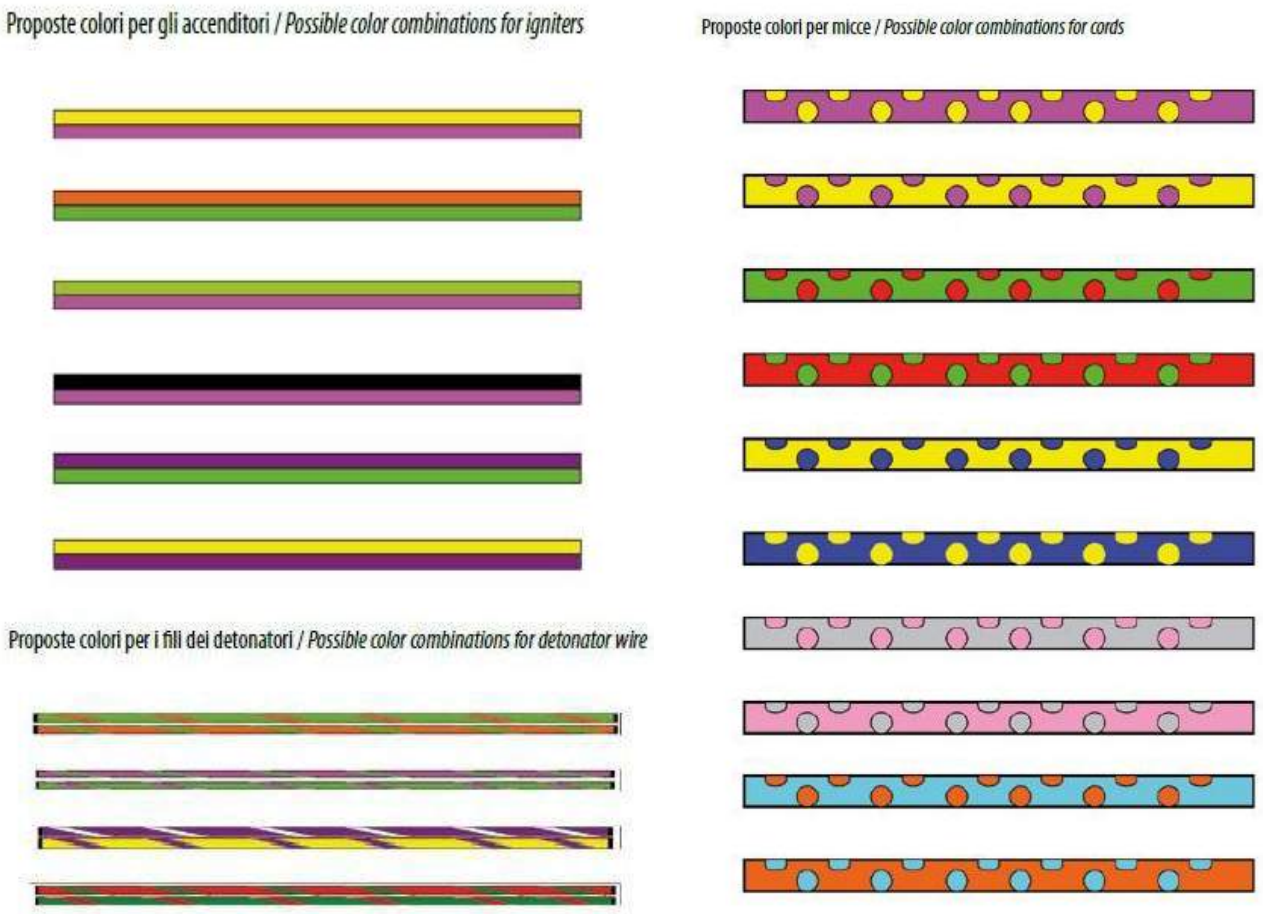
Having once reviewed the study on standardizing the color-coding of explosives, we have to assert that the present suggestion cannot be approved by the EFEE from the current vantage point. Reasons are that the suggested color combinations are partly quite complicated so that they could hardly be implemented or only if using great efforts. Also, the wires of the detonators are already marked using specific color combinations informing users about technical parameters. Furthermore, it must be honestly questioned whether the goal of improving the safety when handling explosives could actually reached by implementing such a standardization of color-coding for explosives. This should be challenged especially in connection with the current implementation of the Directive 2008/43/EC and the Directive 2012/4/EU about Track and Trace of Explosives before further steps are made towards spreading and implementing this suggestion. From the EFEEs point of view it is a pity that no information was shared or discussed on a European level with the Departments responsible for explosives, i.e. the Explosive Working Group in the Directorate Enterprise and Industry. The EFEE will address this topic in October 2014 at the next meeting of the Explosive Working Group and will keep you informed about the progress of this matter.

Jörg Rennert, Member of the Board
Dresdner Sprengschule GmbH



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New EFEE members

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

Individual Members

Cornelius Keigher, Irish Industrial Explosives, Ireland
Denise Clarke, Homeland Security Qualifications Ltd, UK
Sjoerd Spijkerman, Spijkerman Berg och Sprängteknik AB, Sweden
Nikolay Todorov Georgiev, Dundee Precious Metals Chelopech, Bulgaria
Ljubomir Zafirovski, Jack Rijk Al Rushaid Ltd., Republic of Macedonia
Thierry Bernard, Thierry Bernard Technologie, France
Kacmar Ladislav, Dúha, s.r.o.Slovakia
Colin Fergusson, Boskalis Rock Fall, UK

Company Members

Nitroerg S.A., Poland
http://www.nitroerg.pl/

NITROERG S.A. was established on December 1st, 2006 under a merger agreement between two well-known Polish plastics and explosives manufacturers: ZTS "ERG-BIERUŃ" S.A. and NITRON S.A.
As the effect of the merger a modern company was established – the biggest in Poland producer of explosives and initiating systems for industrial purposes.
Experience and prestige inherited from both production plants had influence on significant increase of NITROERG S.A. competitiveness on Polish and global markets. New established company had extended assortment of products, presenting the newest solutions from explosive materials branch.

NITROERG S.A. offers two kinds of products:

- Explosives and initiating systems
- Fuel additive 2-EHN (NITROCET 50®)

Company production is run in two production plants located in:
Krupski Młyn- production of: nitroglycerin explosives, powders explosives, electric detonators, non-electric initiating system, shock tube, detonation cords, fuel additive NITROCET 50®;
Bieruń – production of: emulsion explosives, nitroglycerin explosives, powders explosives, non-electric initiating system, electric detonators.

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National member

Irish Mining and Quarrying Society (IMQS), Ireland
www.imqs.ie

The Irish Mining and Quarrying Society is an independent society for people involved in all aspects of the Minerals Industry in Ireland. We aim to promote, safeguard and represent the best interests of the natural resources and extractive industries in Ireland and the people who work in it.
This flourishing Society was founded in 1958 to provide a focal point for all those working in the extractive industry in Ireland. The membership is drawn from all sectors of the industry, ranging from exploration geologists to equipment suppliers. As such, it has a unique role in the country as a forum for contact between the different branches of the industry, enabling it to reflect the industry views in a co-ordinated manner and is recognised as a significant representational body with over 260 full Society members at present (including 11 Corporate Members).

Information abut voting rights for companies in EFEE

According to the By-Laws, the Corporate and Individuals EFEE members are entitled to have representatives at the Council and General Assembly. The number of representatives is established according to the formula presented in Article 11.

In order to nominate the Corporate and Individual representatives for 2015 an election process will be carried out during next January and February 2015. The Election Committee will provide information about the Election calendar. The candidates who wish to be nominated should communicate intent to EFEE secretary by email to info@efee.eu, with a short description of their company (for Corporate members) or a short CV (for Individual members) – about A4 half page. The list of the nominated candidates will be later disseminated with voting procedure. Votes must be addressed by email to the EFEE secretary, with cc: to the Election President. The results will be announced at the end of February 2015. The number of nominated representatives is established according to the formula in Article 11 of the By-Laws.

The elected representatives will receive the invitation to the Council meetings and the General Assembly in April 2015. Council meetings are held twice a year and the General Assembly shall be convened once a year in conjunction with the spring Council meeting. Travel and accommodation costs of representatives are supported by themselves.

José Góis, President of Election Committee

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EFEE
8th WORLD CONFERENCE
ON EXPLOSIVES AND BLASTING
LYON, FRANCE 2015
26th – 28th April
On Sunday 26 April 2015 the European Federation of Explosive Engineers will present its 8th World Conference on Explosives and Blasting at the Lyon Convention Centre, France.
The World Conferences on Explosives and Blasting is an excellent platform for becoming familiar with the current developments in the blasting technology sector. It is also an excellent arena for blasting technology experts from all over the world to extensively exchange their experiences.
The conference includes:
- Large Industry Exhibition
- Latest Innovations and Technology
- Technical Presentations
- Partner Leisure Programme
- Industry Specific Workshops
For further details visit www.efee2015.com
or email: info@efee2015.com

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Upcoming Events

Austria Tunnel day 8th October 2014, organized by ITA Austria - 63rd Geomechanics Colloqium
8 – 10 October 2014
Salzburg Austria
www.oegg.at

2015 ISEE
1-4th February, 2015
New Orleans, USA
https://www.isee.org/

SME Annual Meeting
February 15-18, 2015
Denver, CO, USA
www.smenet.org

8th EFEE World Conference on Explosives and Blasting
April 26-28, 2015
Lyon, France
www.efee2015.com

CIM Conference and Exhibition
May 11-14, 2015
Montreal, Quebec, Canada
www.cim.org

World Tunnel Congress 2015
May 22-18, 2015
Dubrovnik, Croatia
www.wtc15.com

FRAGBLAST 11
11th International Symposium on Rock Fragmentation by Blasting
August 24-25, 2015
Sydney, Australia
http://www.fragblast11.org/

World Tunnel Congress 2016
April 22-28, 2016
San Fransisco, USA
http://www.wtc2016.us/

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