

*3. EU directives and
harmonisation work*

EUEXNet – A European Explosives Network

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ABSTRACT: This paper will discuss the possibility of developing a European framework for competencies into a well functioning tool for supplying education and training, within a specific sector in Europe, so it fits in with different countries and their national systems of education and working life. The idea of the framework is to develop a system of training that can balance needs and demands, defined by individuals and companies situated in a highly regulated sector, with the supply from education providers.

The paper builds on a longitudinal study and participation in a European project. The project started in 2003 and is expected to finish in October 2011. It involves twelve partner organisations representing researchers, education providers and social partners from eleven European states. The methods used are interviews with project members and students, participation in project and steering group meetings, participation in dissemination activities and finally evaluation and follow-up of project work.

1. INTRODUCTION

An understanding of explosives science and technology, and the competence to harness it, is central to maintaining explosives capability, national security, and the sustaining of a competitive industry. A consequence of eroding this competence is the increased likelihood of explosives accidents. These are often catastrophic as demonstrated by accidents in Nigeria, Russia, Toulouse and Enschede. In addition to the serious loss of life there was the very significant damage to

houses, domestic and industrial infrastructure and to the environment at a cost of many millions of Euros.

There is a perception and some evidence that in Europe competence in this key technological area is being eroded. In several European nations a high proportion of the most experienced and knowledgeable personnel are retiring or nearing retirement. Urgent efforts are therefore underway in some European nations to replenish this expertise.

Explosives are fundamental tools for building our modern society. They are used for blasting in

construction, mining and oil exploitation, airbags in cars, in medicine, in fuels and devices for space rockets and satellites, for pyrotechnics such as emergency rockets/signals, and for defence material.

As well as in other sectors in our modern society, international trade opens up national markets to global competition. Europe has an ageing population and in order to maintain a safe and competitive European explosives sector it is necessary to attract and recruit talented people. Through transnational European cooperation with joint education and training programmes the explosive sector can provide wide experience opportunities which also enable attractive career opportunities.

However, since the turn of the Millennium there have been a number of well publicised explosives accidents around the world. One of the characteristics of these accidents is that they frequently have catastrophic consequences. In Lagos, Nigeria an ammunition dump exploded, the explosion created mass panic which subsequently led to the deaths of nearly 1000 people, most of whom were children. Another explosives accident aboard a Russian submarine led to the loss of 118 sailors, a loss of significant defence capability and serious political destabilisation of the Putin Government. In Holland an explosion involving fireworks destroyed 200 houses and killed 22 people,

whilst in France an explosion involving ammonium nitrate destroyed a major industrial facility, killed 30 people and injured around 2000. The consequence of explosives accidents is frequently serious in human, economic and political terms.

Examining the cause of explosives accidents invariably reveals that human error or failure is a major contributory factor. The Enschede incident in Holland was initiated by a deliberate act by a malcontent. However the catastrophic consequences were also a result of management failure, breaches of the explosives regulations and a failure to understand that storing fireworks inside steel ISO-containers generates sufficient confinement to maximise the violence of the event.

One of the torpedos loaded on the Kursk is known to have been dropped prior to embarkation and this may be linked to the torpedo explosion which, the official report suggests, led to the loss of the submarine and its crew. In both cases it was the actions of individuals or the failure to act in an appropriate way which contributed to the accident. Effective explosives safety depends on people making the right decisions at the right time. It depends upon people having the necessary competence to carry out their jobs properly. The concept of competence is well recognised in UK safety management. Much of UK safety legislation calls for ‘competent people’ in roles that affect safety. In the case of explosives, this will be in

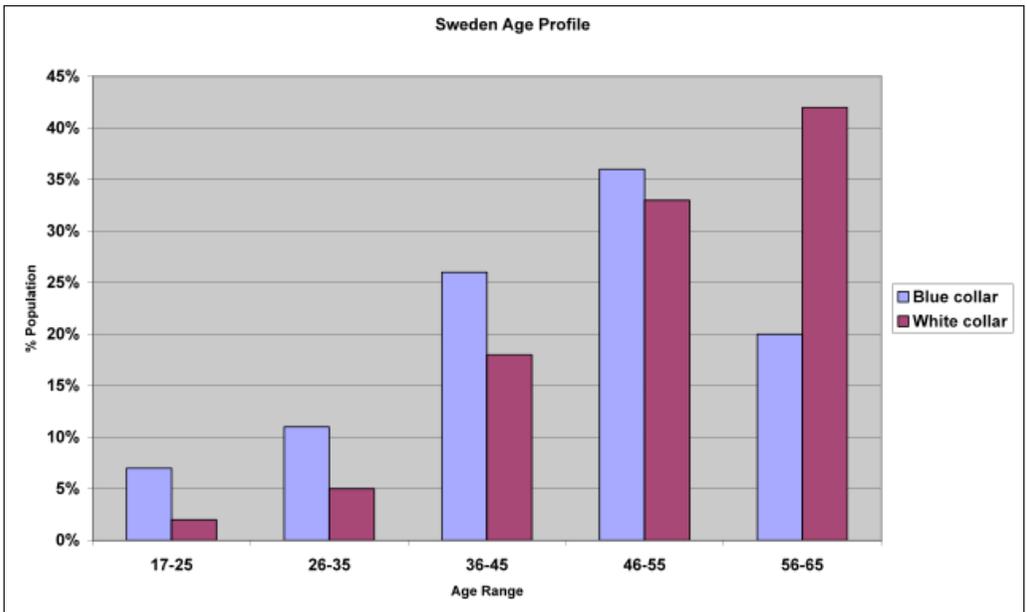


Figure 1. Age profile of white and blue collar workers in the explosives industry in Sweden

all stages of life, from the formulation of new explosives in the laboratory, through manufacture, storage, transportation, use and disposal.

Whilst the stove piping of organisations in the European and UK explosives business has had an impact on the breadth of experience, the general contraction of the explosives business in Europe and the UK has had a major impact on the numbers of skilled specialists. Added to this many of the specialists were recruited during a growth period in defence science and technology in the 1970s and are approaching retirement. A lack of recruitment in the late 1970s and 1980s has left a demographic trough, wherein there

are insufficient skilled explosives specialists to replace those who will be leaving government service in the next few years. Figure 1 illustrates the typical problems faced by European countries with respect to the loss of expertise, if you assume that the ‘experts’ are those who are of the age 50+.

2. EUExNET

The Leonardo da Vinci programme office awarded EUExNet, in 2009, with a further two years funding in order to continue the EUExcert programme of work. The objectives of this new programme of work are to make the independent European association



EUExcert operative subsequently with signing of an agreement between the EUExNet project partners. The association's aims are to develop exchange programs for students and employees, between member organisations in Europe, thus realising the free movement of workers. The independent national nodes/bodies have the task of awarding EUExcert certificates and being responsible for accrediting other awarding bodies. EUExcert certificates will be issued to individuals in the explosives sector, based on a procedure of accreditation of individual competencies according to the occupational standards that have been chosen as best practice by the previous EUExcert projects.

The EUExNet project will monitor and evaluate the work to set up national nodes/bodies and the procedures for accreditation and issuing of certificates at national nodes/bodies. The ambition of the EUExNet project is to introduce a systematic approach to:

- Lift the status of workers in the explosives sector
- Attract younger people to work in the sector
- Respond to the effects of demographic changes in an ageing workforce
- Introduce trajectories for career paths for workers
- Encourage individuals to continually improve their abilities, skills and competencies
- Develop a competitive European explosives sector
- Create a learning environment and thereby realise the overall ambition in the ideas of life-long learning

3. EUROPEAN PARTNERS

At the present time the number of participating countries in EUExNet are 10, these are UK, Sweden, Norway, Latvia, Italy, Ireland, Portugal, Germany, Estonia, and the Czech Republic also one European organisation are represented in the project. Finland and Lithuania are associated partners in the project. The number of associated partners will increase during the project time. It is also important to note that EFEE is a member

of EUExNet which represents 23 countries. In order to increase this number of participating countries, it is intended to widely disseminate the work undertaken in the programme by spreading knowledge about the competence framework to the explosive sector in Europe and the rest of the world by presenting papers and posters on the outcomes of the EUExcert project at national and international conferences, seminars etc.

4. NATIONAL NODES/BODIES

During the project independent national nodes/bodies will be started. The national nodes/bodies will be set up according to national prerequisites. However the nodes/bodies should build their work on using the occupational standards proposed by the EUExcert project or use other adequate occupational standards which can be recognised by the EUExcert partners. The national node/body shall participate in making the independent European association, EUExcert, operative subsequently with signing an agreement.

This part of the project will consist of:

- Defining the explosives sector in the partnership country
- Trying to estimate the sector size and its key persons
- Mapping of existing education and training provisions
- Building an internet based national network of interested persons
- Distributing written information
- Inviting and gathering interested persons to a meeting for presentation of the findings in the EUExcert projects
- Setting up national EUExcert node
- Associate the national node with the European EUExcert organisation practise by the previous EUExcert projects.

5. ISSUING CERTIFICATES

During the project test issuing of competence certificates will take place. The test certificates will be issued to individuals in the explosives sector, based on a procedure of accreditation of individual competencies according to the occupational standards that have been chosen as best practise by the previous EUExcert projects.

Procedures will be developed and will mainly follow the scheme below:

- At the first project meeting one or more occupational standard relevant for the explosives sector will be chosen for the test
- The partners responsible for the test will be chosen
- A subproject group will be established
- The partners who perform the certification will design a test procedure
- The test procedure will be discussed with the other partners
- Trials will be made for accreditation of explosive competence
- Certificates will be issued

6. EUEXCERT A EUROPEAN ASSOCIATION

One final outcome of the EUExNet project will be to establish the EUExcert association. The aims of the association are to:

- Serve as the central European EUExcert organisation
- Coordinate transnational competencies in the explosives sector
- Award the EU certificate to the national EUExcert organisations
- Form, expand and maintain a transnational network, aiming to promote excellence in explosives competence and thereby reduce accidents in the explosives sector
- Search for international cooperation

- Publish articles in professional newspapers for the explosives sector
- Promote and manage exchange programmes for students and specialists in the explosives sector
- Promote cooperation for transnational education and training in the explosives sector
- Manage a database and network of experts
- Manage and update the glossary on terminology for the explosives sector
- Support the European Commission with independent advice
- Be the sole and exclusive owner of the trademark EUExcert
- Organise global conferences on explosives competence

7. FUTURE ACTIVITIES

- Strengthen the trade mark EUExcert
- Engage more European partners,
- Establish national nodes in new countries
- Engage international partners
- Find representative voices in national governments.
- Find representative voices in the EU Commission
- Improve quality and reputation through a professionally recognized skilled workforce
- Implement the European Credit System for Vocational Education and Training (ECVET)

8. KEY FINDINGS

The paper will discuss the value of developing a European framework for competencies within a specific sector and show that although the framework will solve a lot of problems within one sector it is quite hard to realise, but still not impossible. The problems that arise along the

way are posed by the differences found in each nation's legislation, tradition of education, system for education, technological development related to education and training, and even in the tradition of collaboration between education providers and representatives from different stakeholder groups. The paper will also discuss the issue of demand-The stakeholders need to have knowledge of many things in order realise the ideas of a European framework for competencies, for example how to collaborate with stakeholders in, and outside, national boundaries, systems for accreditation of previous experience and learning, and how to use tools for accreditation and gap-analysis. Each nation has reached different maturity and readiness for change to develop systems for adult learning within their formal systems of education and training. To be able to implement a European framework for competencies each nation needs to fit their infrastructure for learning with the common ideas of the framework; for example, how to validate previous learning, conduct gap-analysis, supply demand led learning at workplace level, develop new pedagogical methods for flexible learning, develop new methods for collaboration between companies and education providers, and develop methods to certify outcomes of individual learning. Each nation should also appoint organisations that can be responsible for issuing certificates and updating occupational standards.

There are many people and organisations who promote the harmonisation of European systems of education and training; still there is little evidence of how to go about realising these ideas. To be able to succeed it requires, for example, that the people involved in the change work have the power and mandate to influence strategic players – otherwise there is a risk that the efforts do not lead to any significant change in national systems or in

practice.

Keywords:

European qualification framework, occupational standards, skills transfer, explosives sector, hazards and accidents, safety, security, competence and competencies

9. ACKNOWLEDGEMENTS

The research was conducted as part of the project, 'EUExNet' (grant number: 503572-LLP-1-2009-1-SE-LEONARDO-LNV), financed by the European Commission, Lifelong Learning Programme, and administered by EACEA, Education, Audiovisual and Culture Executive Agency.

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Education and Culture DG

Lifelong Learning Programme

Authorized Rock Blaster - the project that revolutionizes the rock blasting industry

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ABSTRACT: In 2009 The Swedish Rock Blasting Contractors Association started the project Authorized Rock Blaster which hopefully will revolutionize the industry. During the past year, 64 companies have completed the course. The project was initiated by the member companies themselves to try to lift the status of the industry and assist clients to make an easier choice in the selection of rock blasting companies. The main objective is that clients should feel secure in the purchase of rock blasting, that the job is done safely and professionally. The clients' security is the external auditor who reviewed that companies meet the requirements. Rock Blasting is and can be extremely dangerous if it is performed incorrectly. The projects assignment is to prove that it cannot always be the prize that is the determining factor. The project has been well received by rock blasting companies themselves, the future lies therefore in the customers' hands.

1. INTRODUCTION

Rock Blasting differs significantly from other activities in the construction industry. The regulations that control the rock blasting industry define more than in other fields special responsibilities and accountability of individuals. Rock Blasting is and can be extremely dangerous, if it is performed by ignorant and irresponsible people. Although the

rock blasting industry is extremely dangerous there are unfortunately still many people who tamper with the rules and safety. Sometimes it is consciously but more often it is because of a lack of knowledge. Also the clients close their eyes for deficiencies of intention to make money on the lack of safety and quality. With this background the Swedish Rock Blasting Contractors Association, BEF, in 2009 started the project Authorized Rock Blaster.

2. PURPOSE

In order to raise the status of the industry and restore the rock blasters reputation BEF's member companies took the initiative to try to raise the skill levels and simplify the procurement for the client. The purpose of Authorized Rock Blaster is to ensure the client companies have the knowledge required to perform rock blasting under Swedish law and other industry regulations. The authorized companies should minimize the risk factor while delivering high quality. The primary purpose is that the client should not need to have any knowledge about rock blasting, but still feel safe with the job done safely and professionally. Certification is a mark of quality that the company and its staff have the necessary skills. The client will find value in hiring an Authorized Rock Blaster.

3. WHAT DOES AUTHORIZED ROCK BLASTING COMPANY MEAN?

It means that the company and its staff have taken a two day course that BEF is responsible for. Well known names in the industry are used as lecturers. The course focuses on systematizing the daily work to achieve safety and quality.

The company then has to implement the routines and work systematized and controlled to reach the stated requirements of Authorized Rock Blaster. They are through the authorization bound to document their work.

The authorization is at company level. But everyone involved in the main process of rock blasting, including persons that are continually hired more than one month, have to take the course.

The working routines that Authorized Rock Blaster requires has been implemented in the companies and then followed up.

The companies then undergo a regular audit in which an independent external auditor verifies that businesses meet the demands of the authorization. If there are any deficiencies they have to be corrected, otherwise the company can lose their authorization.

3.1 Who can become an Authorized Rock Blaster?

The company must be a member of BEF to become an Authorized Rock Blaster. All BEF companies have been offered to take the course. The goal is

that all BEF's member companies will become an Authorized Rock Blaster.

3.2 Content of the project

The focus of the authorization is not in the technical education, but in the systematic training. The technical training is obtained in the ordinary necessary education according to industry, when you get the license of performing rock blasting, drilling, and driving explosives. It is a requirement that companies that are authorized hold all necessary licenses.

Each company undergoes training consisting of repetition and deepening of their basic training, focusing on safety and risky moments, Swedish laws and regulations, safety, Quality-, environment- and working environment systems, industry-related areas such as driving explosives regulations, storage of explosives and other restrictions.

3.3 General conditions

An Authorized Rock Blasting company has to:

- Complete training for Authorized Rock Blaster.
- Follow the laws and regulations that apply to running a business, such as taxes and collective agreements.
- Follow the laws and rules that apply to blasting and otherwise meet the requirements for an Authorized Rock Blaster.
- Follow BEF's ethics rules.
- Follow BEF's policies and guidelines within quality, environment, and working environment. Every company has to have their own policies.
- Fulfill BEF's criteria of membership.
- All staff must have the required training for their duties such as licenses of rock blasting, drilling and driving explosives.
- Document their work in a structured way.
- Contribute to the audit to be performed efficiently and without interruption prevention.
- Maintain the training requirements, newly employed have to take the course as soon as possible.
- Paying necessary fees of the authorization.
- The company shall operate in compliance with the requirements contained in the company's Quality-, environment- and working environment system.

3.4 The company's responsibility

After completion of training the company must implement the requirements and working practices as Authorized Rock Blaster requires. The company is responsible to systematize their work and introduce the necessary procedures for Authorized Rock Blaster. It is also the company's obligation to ensure that the requirements and procedures are complied with.

Management must give staff the resources necessary to carry out work in accordance with Authorized Rock Blaster. Management must actively monitor and support staff to obtain the stated requirements.

The employer shall ensure that policies and procedures are established for an effective quality, environmental and work environment, and that these are implemented and respected in the company.

Company management and its employees are jointly responsible for the company's compliance with the requirements of Authorized Rock Blaster

3.5 BEF's responsibility

It was BEF's member companies that took the initiative to commence the project, through a resolution at the yearly meeting.

BEF is responsible for the authorization of companies and BEF is issuing the authorization.

BEF is responsible for the administrative work of the project, and to support authorized companies and provide necessary materials.

BEF ensures all authorized companies remain informed and trained according to the latest regulations and standards governing the market.

BEF will also provide checklists and supporting forms that companies can use to meet the requirements.

BEF is responsible for audits of companies are conducted in accordance with the requirements with the external auditor.

3.6 External Auditor

The use of external, independent auditors by BEF should give customers security. These people audit the companies and verify that they meet the requirements for qualification. The auditor has, in dialogue with BEF, established the criteria for the review process. Audits of companies are carried out

regularly to ensure that the company continues to meet the requirements for Authorized Rock Blaster. It is these revisions that are the clients' security.

4. THE PROJECT'S PROGRESS

A year has now passed since the project came into operation in December 2009 after the decision was taken at the general meeting that year. It is in its early stages, but has come quite a way already. Here's a summary of the first year.

The goal set for 2010 was to offer all our members a chance to take the Authorized Rock Blaster course, and we succeeded. For various reasons it was not, however, all of our members who took the chance, so we will certainly offer them another chance in 2011. So far 64 companies completed the course, which means that more than 300 people took the course during the past year. Of these, 30 companies have so far been authorized, but the majority are on the way.

During the year, BEF had courses all over Sweden. The courses have been highly appreciated by participants and rock blasters themselves seem to agree that an authorization is needed for the industry. This is a chance to raise the status of the industry and highlight those companies that have been organized.

Most of the companies are currently included in the implementation process, which is the step between the course and formal company authorization. Most companies are now evaluating their procedures and practices and looking at what might be done differently to meet the qualification. Some companies have been helped by BEF, but most carry the work on their own.

In early autumn, BEF and the external auditor did some test audits. This was done in order to find a good model for the coming year's real audits, and also to get a feeling of how the work went on in the companies. After the test audit it was decided that the first companies were ready to be authorized, and now there are 30 Authorized Rock blasting companies on the market and more are coming.

5. RESULTS

As the project is in its initial phase, it is still early to ensure a proper result. In summary, we see 2010 as an intensive and successful start and we obviously hope that 2011 will be the year when most of BEF's

members are authorized and that the Authorized Rock Blaster is the revolution that everyone is talking about!

Although BEF's member companies already many times have good order, we are very pleased to say that the authorization has meant a boost for many companies purely organizational, where they now have better control over their documentation. This benefits both the client and of course the company itself.

Some clients have already picked up the idea to support the project. NCC Roads has issued Authorized Rock Blaster companies in their register of suppliers and we hope for similar initiatives.

The courses have been rated highly by participants. The speakers have received favorable reviews and the participants think it is nice that we are trying to further develop the industry in a positive and serious spirit. As one participant said: *"It strengthens the self-image and the company"*.

Another participant, Lars Kvarnvik owner of Värnamo Blasting Service, said: *"Certification is good for our own part, because it is a great way to review the company's operations. The hope is that it will provide jobs, when we show that we are at the forefront and have everything in order. We do not want to push the price, if it is too cheap we rather do not take the job. The authorization is there for us to compete on equal terms. It should pay to be organized. Authorized Rock Blaster gives good credit to the company."*

6. CONCLUSIONS

The conclusion we can draw is that the project's future rests a bit in the customers' hands. It is not enough for rock blasting contractors to clean up their act, it also requires that clients do it. If we are going to be able to transform the industry into a model where security and safety is always in focus, it requires clients who see profit in hiring a company with good order. Rock Blasting is and can be extremely dangerous if it is carried out by ignorant and irresponsible people. Rock blasting is that part of the construction industry covered by most laws, regulations and restrictions. So why take a chance? Why not directly choose a company that you know controls the whole process? Why risk standing there with a company that does not comply with Swedish law? It can ultimately affect yourself, both financially in terms of confidence

and reputationally, especially when there is such a simple solution as hiring an Authorized Rock Blaster. BEF is using external auditors to check that companies have their documentation in order and comply with Swedish law.

Please help us to lead the way so we can jointly transform our industry into one that is synonymous with high safety and few accidents despite our complex and sometimes hazardous work. Unfortunately, does not the statistics really look like that today.

The period for revolution and renewal in the rock blasting industry has come. Even if transformation doesn't occur overnight, we hope Authorized Rock Blaster will eventually lead to a big boost for the industry.