A Pilot Project within
Leonardo da Vinci Programme

Co-ordinated by A. F. Forum

Integration of Safety, Environment and Quality in companies

Guide for Trainers

SEQUI

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1 Project objective

Enterprises of all sizes and branches are faced with diverse, constantly changing demands today and in the future:
On the one hand, these demands arise from business, production or service processes, and product and performance demands; and in the end they are influenced by the consumer.
On the other hand, in the last few years – in the framework of the standardisation of the European economic area – consumer demands, legal and official requirements are defined through various international norms. The application of these guidelines directly results in the introduction of different management systems.
The protection of employees is a prime concern in enterprises: it prevents occupational diseases and accidents, and therefore decreases sick leave. The absence of a single employee, especially in small and medium-sized businesses, can have dire consequences.
The main goal of environmental protection in enterprises is the protection of the natural environment from the negative effects of business activities, preservation of natural resources and improvement of business image. Slowly but surely, more and more environmental management systems are gaining hold in Austria. A positive environmental image also offers small and medium-sized businesses new market chances. The demand for environmental friendly products is increasing.
Many enterprises already practise quality management. In this way, they create the basic conditions for quality-oriented thinking and action, and therefore also for consumer-oriented products and services. Small and medium-sized businesses are increasingly faced with requests from consumers from the industry for proof of a “certified” quality management system.
Work safety, environmental protection and quality management are increasingly gaining importance in daily business life. These facets however are not strictly separated from each other. The overlapping areas are so omnipresent that a comprehensive approach is needed. Of all the different management systems, the Integrated Management System (IMS) has proven to be the most effective. It attempts to achieve integral business management through the synergetic integration of different demands.
This report illustrates the current trend of moving away from parallel running management systems to integrated management systems and the adaptation through certification according to international norms. Applied to relevant training and further training offers, this causes the adaptation to a country-wide synchronisation of training standards and creates a pertinent, modular training and further training program in accordance with the integrated management system.
The objective of the pilot project is the development of curricula for the generic manager which shall combine quality and environmental management system, till now run parallel in enterprises, and employee protection into an integrated management system. The curricula shall also help in the further training of existing generic managers and the initial training of future generic managers with the main focus being the integration of these three areas. The network is composed of 6 members f
rom 3 countries (Austria, France and Italy), all of them different types of institutions (Training Organisations, Universities, Consulting Organisations, Trade Chambers).

The main goals of the project can be summarised in the following way:

- To study and compare, for the three countries involved, the models of safety, environment and quality integration as well as the training offers for the considered areas, both at university and professional levels.
- To identify the need for new professional profiles in the areas of safety, environment and quality in the SME of the agro-alimentary field.
- To analyse the training needs and offers for the professional profiles considered.
- To enhance the results obtained by providing an optimum model of training, to be realised both in universities and enterprises.
- To reinforce the links between universities and enterprises and involve other partners in the project.
- To spread the results of the project.

2 Schedule of activities

Members of the team and their activities:

Company/Organisation	Contact Person	Adresse	Nation	Role
AF Forum, Assocoazione per l´ Alta Formatione	Pietro Ragni, Elisabetha Elmi, Martino Rebonato	Via Carlo Mirabello 7, 00195-Rome	Italy	Project Coordinator
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This report will be followed by an in-depth study of the relevant community and national regulations, while the section concerning training offers will be supplemented with a detailed study of the contents of existing training courses.
Moreover, to encourage the further exchange of information among all partners, a comparative analysis of the regulations, real need for new professional profiles and training offers in Italy, Austria and France is included.

Initial or analysis phase

Analysis of the present situation regarding professional training, and the distribution of safety and environment and quality integration systems within the three participating countries. The result will be the first identification of new professional profiles, their training needs necessary for quality integration and the available training offers.

- First exchange of information between the partners, concerning the analysis of the individual situations and their transfer to AF Forum and CRA Montecatini.
- Realisation by AF FORUM and CRA Montecatini of a first Italian draft about the identification and definition of the professional profiles, evaluating training offers both at university and professional levels
- Conclusion for the three national cases.

Development phase

This phase is based on the creation of new competence profiles through the design, achievement and development of an integrated system based on experiences already successfully realised at a national level, interviews and other case studies.

- Evaluation of the activities achieved, with written suggestions by the other partners, starting with the interviews for each partner, presentation of the texts already written (Nantes, December or January).
- Realisation of the first draft of questionnaires by AF Forum and CRA Montecatini and, upon agreement, start of interviews.

The first purpose of the research was to verify to which extent the training solutions examined through the case studies were suitable with regard to small and medium enterprises.
In detail, firstly the European experiences examined had to help the „Sequi“ Scientific Committee find out the important tools needed to facilitate the implementation of an integrated management system in small and medium enterprises.
Secondly „Sequi“ case studies had to identify the emergent training needs and suggest to the trainer in this field ways to perform vocational training courses.
Methodologically the research was set up focusing on the organisational and management dimensions of safety. The juridical aspects were considered only when directly related to the management.
The research took into consideration an European context and the Italian, Austrian and French states in detail.

Methodology

The methodology adopted in this phase of the research took the remarkable differences among the experiences of the European case studies into account.
For this reason, in the first phase a group of „Common Keys“ was adopted to accomplish a unique interpretation model of the learning processes in the company.
This highly experimental and methodological approach has permitted Sequi’s partners to identify the roots of organisational changes and manage the interventions with modalities specially oriented towards the participation of the largest number of employees.

The case studies selected

The research (started on Spring 1999 and ended on Summer 2000), seven case studies were selected and analysed:

- 3 training/ further training offers
- 4 enterprises

chosen according to the following criteria:

- SME which has integrated two of the three systems, to show how the integration of systems works in practice (under 250 employees)
- Diversified productive system
- Diversified geographical set up
- A good network of relations with other local bodies (local institutions, craft unions, industrial medicine,)

3 Comparability of data

The report data can be beside some small divergences, compared well, with one another due to the binding formulation of questions on the project objective.
In all three involved countries, an investigation of national training offers was likewise carried out.
In the evaluation of the interviews carried out, differences however were present due to the formulation of certain questions. Firstly, this can be attributed to the different degrees of participation of the involved researchers in the project conception. Secondly, this is due to the fact that the questionnaires had to be translated to the national language of the countries involved in the research project. A recognised communication thesis states that what B hears and not what A says is true. This explains – due to the translation of questionnaires –the slight deviation in some questions that the national mentality is unconsciously and automatically associated with. Thirdly, divergence in the evaluation and reporting of questionnaires was present: in Italy 22 and in France 28 interviews were carried out. Austria as a small country however only carried out 14 interviews. As a result of the small samplings, the interview data in Austria was qualitative evaluated and presented, in contrast to the other two countries. Never the less, the results can be compared well with one another.
The objective of the case studies carried out was to investigate models of good practice and not identify national specifications.
The case studies carried out may show different approaches, the questions however were largely synchronized. The Italian partners, due to their role as project coordinator, therefore carried out one case study; France and Austria however carried out three case studies each.

4 The quality-safety-environment problem[1]

The principle elements

The question here is one of identifying a common objective. This objective is to guarantee the physical and mental integrity of persons and their families and in a more general sense to ensure, in the best possible way, an economic and social well being.
In this way then it is the 'man' who is at the very centre of these reflections, whether he is a designer or manufacturer, consumer or worker.
Since the realisation of the fact that progress is not without its limits, and that we do not follow a continuous, linear path in our progression, the achievement of this aim, which some continue to think of as utopia, depends on having a global approach to the objectives and the setting up of convergent action strategies.
Anticipating dysfunction, attacks on health and environment will consist of finding the best possible combinations of action in relation to man, organisation and technical requirements.
Straight away we can see the complexity of both the problems and solutions. Indeed our problematic is, at first glance, not very motivating !
Nevertheless we don't really have a choice as there are three large areas of action which concern us :

- Prevention, which aims to detect, analyse and act on the sources of dysfunction before it actually occurs,
- Repair, which aims to correct the system failures before they begin to manifest themselves in a significant way,
- Indemnification, which compensates for the loss suffered.

These three approaches are all implemented at the same time but we may question their respective social and economic cost.
The interest then of the Q.S.E. problem is not that it covers a particular group of problems or fix-it solutions but in the fact these issues lie at the very root of efficiency and performance.

The elements at stake

The health and safety requirements for material goods, people, social groups and the environment are divided between a wide range of people, so the battle against health risks comes into play not so much at the level of the principle of the matter but of the concrete application of judicial, economic and social action plans.
The universality of the needs in this area makes the field of health and safety an economic factor in its own right. This is due to :
the costs of repair and victim compensation, which are met by the economic parties.
the setting up of public or private structures, of national or international institutions which constitute a 'non-business trade' charge but which are also an important element in the development of new activities.
the existence of a redistribution of wealth circuit which possesses its own economic logic susceptible to influencing the business trade sector.

1 A presentation by **Mr. Eric Cattaruzza**, a European consultant, at the Sequi conference, 9/4/99, Nantes France (70 participants: 50% from industry)

The economic repercussions of victim compensation

- On the economic level, businesses are taking different types of risks, a lot of which do not appear to be directly related to their actual chosen activity (the principle of complimentary insurance),
- On the financial level, the organisation of present-day economic exchange and the weight of compensations are questioning the viability of the systems of prevention and damage reparation,
- On the management level, the stability if not advantage of a good prevention policy is being more closely analysed in order to optimise the human and material means available in face of increased economic competition,
- On the legal level, the role given to the state in society and the increase in different forms of contracts has meant the evolution of present-day relationship between the mechanisms of compensation and risk assessment and the manufacturing and services industries,
- On the social level, individual mentalities are evolving in the sense of a better consideration of the factors involved in insecurity and safety in both their professional and private activities.

A better understanding of what's at stake with Q.S.E. then means to be in touch with both the specific and the non-specific demands, satisfy the needs which are legitimate and optimise the cost/profit ratio.

The means

When we talk about the means necessary to develop good Q.S.E. politics, we most often argue in terms of solutions. It is normal then to present this problematic in terms of obligations, constraints and normalisation**. Conformity then becomes the end and not the means**. Following this reasoning, it is difficult to imagine that there could be some space left for freedom and innovation.
However, if we look more closely at the 'normalized' definitions of quality, safety and environment, we can see that the expectations are in terms of the end result and not in terms of the implementing prescribed means !
A little more transparency and clarification is asked for in the social relations between client and supplier, employer and employee, manufacturer and citizen. Therefore, it is, above all else, the search for more democratic exchanges of all types. Is this an irrelevant expectation ?
The obligations and norms exist, therefore, in order to specify the practices and define the procedures of action and control. This allows the global performance of the business to improve. Let us just add that these processes have given rise to a dynamic sector of which economic clout is far from negligible.

What are the similarities and differences from the point of view of the elements involved, methodologies and tools.

If we agree on this reasoning, what are the similarities between the different Q.S.E. approaches ? I will outline **some of the elements** :

- To avoid damage,
- To develop a social preoccupation/outlook in the widest sense of the word,
- To conform to the law,
- To develop the bases of more stable internal and external communication,
- To optimise technological and human resources.

I will now outline some of the similar **methodologies** :

- Setting up audits and evaluations of the risks, the means put in place and the expected results,
- Setting up systems of medium term planning and programming,
- A cross-disciplinary or systemic type appraisal,
- A contributory participation on the part of individuals, whatever their social status or function .

So what are the differences ?

In a simplistic way I would say:

- Quality is more centred on the production processes of goods and services and on ways of organising personnel and structures,
- Safety is more centred on the Man-Task-Machine interface,
- Environment on the bio-systems and their consequences for public health.

These three processes are complimentary but do not consider in the same way :

- the time factor,
- the relevant players,
- the necessary scientific disciplines,
- the measuring of the results.

In fact, calling for a management which integrates the quality-safety-environment approach poses particular problems in relation to the required skills.

What does it mean to be an expert in these fields

Here, I will briefly mention a survey based on 17 countries, in which I participated. This report, organized by the health and safety 'DGV', offers us some interesting indications.

- 1^{st} result : the status of Q.S.E. experts :
  Predominantly, Q.S.E. experts are to be found in official or semi-public bodies. This may explain why the perception of Q.S.E. activity that it's only concerned with rules and regulations. This also shows that businesses have not really taken initiatives in this domain.

- 2^{nd} result : the expected services :
  The different countries display marked disparities. For example, in Anglo-Saxon countries the needs in terms of assistance and advice are more expressed than themes like the monitoring of rules and regulations.

- 3^{rd} result : the available resources :
  There is a marked disparity between the number of experts in this field and the need generated by both national and European regulations and recommendations. At the same time, if companies want to start a Q.S.E. program, there is a question about the quality/ level of the training given. This is the case even if training is compulsory and recognised by the state.

Conclusion

Even though the fields of quality, safety and the environment at the moment pose more questions than offer solutions, it's absolutely necessary to consider them as 'being part of any business project in order to further the aims of cohesion, social progress and productivity'.
Private and public resources exist but are either under-staffed or badly staffed. The shoe, then, is definitely on the foot of those who make decisions, innovate, and wish to contribute to the improvement of products, human health and our standard of life.

5 Training offer and national legal regulations

All three reports are based on particular national legal regulations which form the basis for the implementation of Q.S.E. management systems and their application in initial training and further training.

The **Italian** report is divided into university and non-university training and further training offers. It also divides training offers into initial training ("young people") and further training ("adult people").

The **Austrian** report differentiates between training offers from private organisations, offers from union training facilities and public institutes like universities and polytechnics. Here accredited and non-accredited training institutions are diff
erentiated.

The **French** report conveys a reflexive approach to the topic in the first section of the seminar paper from Eric Cattaruzza and Sophie Lefeuvre, held at 4.9.1999 in Nantes, France. The essay throws light on the questions with regard to future curriculum development, and in the second section provides an outline of the French training offers. The report represents a syllabus on initial training and further training offers, with the main reference to safety management.

5.1 Report from Italy[2]

At a continental level, enterprises are now dealing in a single market, where a common competitive discipline is in force and Community regulations have been extended to almost all the vital fields through the setting up of rules concerning environmental protection (nature and public health) and industrial safety, as well as production quality (in order to combine the corporate development needs with those regarding environmental safety).
In Italy, the development of regulations governing the three above-mentioned fields (safety, quality and environment) led to the adoption of legal instruments of which the instructions are not limited to only one of the fields.

The law no. 70, dated 25th January 1994, contains rules for the simplification of fulfilling environment, health and public safety, as well as the carrying out of eco-management and environmental audit systems; the ministerial decree no. 413, dated 2nd August 1995, contains rules for the institution and functioning of the Ecolabel and Ecoaudit Committee.
The new prescriptive trends are one of the reasons for the growing demand for a new professional profile, one of the „controllers“ specialised in giving legal recognition to enterprises which have the intention of making use of instruments like Emas, Ecolabel (and Iso). Companies and experts willing to work as controllers have to be legally recognized. The relationship between controller and enterprise is of a contractual nature.
Regarding training offered by universities, there were special purpose schools which arranged courses aiming at the training of experts in *Healthcare and industrial safety,* as well as specialisation schools in *Industrial safety and protection.*
Among the specialisation courses, of particular interest are those concerning respect for environmental standards (e.g. the course *Quality, certification, analytic references control,* which took place in the academic year 1997/98 at the University „La Sapienza“ in Rome).
Finally, in recent years new degree certificates in *Industrial Safety* as well as degree courses in *Environmental Sciences* have appeared. However, the last ones provide a technical-scientific training which doesn't meet the enterprise requirements nor offer the necessary skills for the quality, safety and environment integration.
With regards to professional training activities, several courses are now available in the above-mentioned fields – instead of school or university education or, more frequently, in addition to the acquired training.
Most of these activities are of public interest and require a regional approval of the course project. Parts of the courses, carried out by different bodies, belong to the training plans approved by the professional training regional Assessorships (or by provincial Assessorships, in Regions where Provinces have been delegated in professional training matters, as stipulated in the *outline law* 21st December 1978, no. 845 *concerning professional training,* as well as in regional laws on the subject).
They can be totally financed or co-financed by the Regions, which provide the acknowledgement of the possible professional qualification. However, there are some courses which don't benefit from funding (free or authorised courses) even if approved by the competent local authority.
The kind of training activity performed in each course depends on the classification usually used by the professional training regional Assessorships. We can identify two major categories: (a) training for the young; (b) training for adults.

[2] *by AF Forum & Centro Ricerche Ambientali Montecatini*

5.1.1 Safety[3]

Legal instruments concerning industrial safety are usually different from those concerning quality and environment.
However, due to the employment of new tools and technologies, some new items about industrial safety are beginning to be regulated by the Community law. An example is the outline directive 89/391 concerning *the carrying out of measures aiming at the improvement of workers' safety and health* and the Directive 90/270 concerning *safety and health for working activities performed on facilities equipped with video terminals.*

In Italy, the law no. 142, dated 19th February 1992 (*Community Law 1991),* delegated the government to the carrying out of the directives concerning workers' health and safety, however only with the legislative decree no.626, dated 19th September 1994, about workers' health and safety, the Directive 89/391 has been put into effect (the decree also regulates the use of facilities equipped with video terminal in the accomplishment of the above-mentioned Community directive no.90/270).
According to the decree, which is neither applicable to the public sector nor the Army, enterprises have to deal with the risk evaluation and they have to send the relevant documentation to the Department of Labour as well as to the other control bodies (among them the National Health System). This results in rather slow procedures and the overlapping of different and sometimes opposing opinions.
Furthermore, Italy is the only European country where the bargaining agency specific for safety is compulsory even in one-man firms.
Finally, we would point out that the item no.1 of the following legislative decree no.242, dated 19th March 1996, which bears some changes to the legislative decree no.626/1994, states that the employer can't delegate the periodical meeting and nomination of person responsible for accident prevention.
As well as the prescriptive aspects, training offers concerning industrial safety are often different from those regarding eco-management and quality systems.
We have to point out that, as regards to safety, the interregional Committee has worked out some guidelines for the enforcement of the law. The training curricula identified in the regional experiences are four: (a) Accident prevention expert (or safety expert); (b) Employer and person responsible for accident prevention; (c) Workers' representative for safety; (d) Planner/Safety training activities co-ordinator.

5.1.2 Quality

Community regulations no.880, dated 23rd March 1992, concerning *Community system for the assignment of an ecological quality label* (Ecolabel), are of great relevance. This label is based on the LCA (*Life Cycle Analysis),* which is the life cycle analysis of a product from the beginning of production to the final sale. The procedure to be followed for the Ecolabel assignment is organised in two levels: community level and national level. As far as the community level is concerned, the Commission, assisted by a Committee and an advisory Forum, identifies the label assignment criteria according to which the environmental impact of the product, for which the Ecolabel is requested, will be evaluated. The Commission starts the procedure on its own initiative or on request from the competent national organisation, which may have acted spontaneously or on the interested subjects' proposal (producers and importers).

[3] by AF Forum

Once the ecological standards to be followed in order to get the certification have been established, it is up to the competent national organisations to grant the ecological quality label.
Producers and importers send in the application containing all the information required to obtain the ecological label to the competent organisation of the member state. If the national organisation thinks that the product fulfils the ecological standards established for that kind of products, it has to convey its decision to the Commission. The label will be awarded when there are no adverse opinions by the member States and the Commission.
The regulations require further efforts from enterprises towards technological innovation with respect to health and environment, as the award of the ecological quality label is regarded with high esteem by the consumer. There are about one hundred products which have received the Community label but there isn't a single Italian product among them.
On the contrary, the national ecological label is going to make its appearance (the idea consists of evaluating the products according to three parameters: CO2 production, waste material production and water consumption).
Training courses emphasising the importance to the LCA for the assignment of ecological quality labels are still very few.

5.1.3 Environment

The new attitude towards environmental problems in enterprises has been particularly encouraged by the International Chamber of Commerce which through the „Carta of enterprises for a supportable development" provided a new instrument for the evaluation of environmental impact of processes and products: the life-cycle analysis.
The life-cycle analysis is an objective process evaluating the environmental loads related to a product, process or activity, which requires the identification and quantification of the energy and used and wasted materials to value their impact on the environment. The evaluation, aiming at identifying and implementing the opportunities for environmental development, concerns the whole life-cycle of the product, process or activity, including raw materials extraction and treatment, manufacture, freight, distribution, use, reuse, recycling and final disposal. To make this analysis, the ISO 14000 – *International system of environmental certification* – has been devised which concerns the whole business set-up and doesn't require any support from the public administration. It considers mainly the relationship between the company and the market and draws its attention to the environmental management system.
In March 1992, the Community Commission presented a bill for the registration, under the Ecoaudit logo, of enterprises which submitted, on their own free will, their activities in the environmental field for regular inspections. The bill then became the Community regulations no.1836, dated 29th June 1993, concerning *the voluntary assent of industrial enterprises to a Community system of eco-management and audit (EMAS – Eco Management and Audit Scheme).*
The environmental audit, as defined in the regulations, is a management instrument offering a systematic, documented, periodical and objective evaluation of the efficiency, organisation, management and process system aimed at environmental protection. The audit purpose consists of promoting a constant improvement of environmental standards in industrial activities, which can assure higher protection levels than those provided for by law. Besides pure environmental audit, the enterprises are actually requested to provide the assessment and development of environmental management internal objectives, certification by legally recognised external companies and the duty to make the document with the inspections results accessible to the public.

The system is divided in different phases, of which the main actors are the organisation, authorised environmental controllers, competent organisation at national level and Community Commission which assumes the role of general supervisor. In order to get the site registration, the enterprise has to:

- apply an environmental policy aiming at a steady improvement in environmental performances;
- make an environmental analysis of the site;
- introduce an environmental programme for the site and environmental management system for all activities carried out in the site.
- The enterprise is also responsible for the two following phases which represent the central aspects of the system provided by the Regulations no. 1836/93:
- the verification that the environmental protection system is functioning;
- the drawing up of a specific environmental statement for the site submitted to audit.

The environmental statement has to be ratified by an external controller, who is independent of the enterprise submitted for verification and qualified for implementing the ratification activity by competent organisations of the member States.
As the entrepreneur has the power to give his assent to the eco-management system, we have to believe that, as regards to the environment, the delegation of duties is easier than in industrial safety matters.

In Italy, on 5th November 1998, the competent organisation, Ecolabel and Ecoaudit Committee – EMAS division, approved the rules and methods for the registration of organisations interested in participating in the system. To this end, it is first of all necessary that the organisation activity is included among those provided in the Community regulations and secondly, that an environmental statement is ratified by a legally recognised controller.

On 17th September 1997 the Committee approved the procedures for the legal recognition of the controller.
At the moment, however, from 1541 registered organisations in Europe at the end of June 1998, only six Italian plants succeeded in getting the excellence diploma in environmental performances.
Moreover, we have to point out that the law 580/93 entrusts the public sector - and particularly the Chambers of Commerce – with the task of supporting and promoting the interests of the enterprises. They have to promote the adoption of instruments like the environmental management system and *auditing* according to the regulations 1836/93 (in this respect we point out the pilot project carried out in Emilia Romagna through the co-operation of the Assessorship for the Environment (Assessorato all'Ambiente), Chambers of Commerce Union and Eurosportello in Ravenna, which aims at informing and awakening the enterprises in the Region to the subjects concerning Community regulations, allowed the carrying out of a training course).

5.1.4 Current situation of university training in the sector

As far as universities training offers are concerned, we draw attention, relative to the first of the three sectors, to recent university degrees (activated during the academic year 97/98) such as „Environmental Health Officer", Faculties of Medicine and Surgery at the University of Cagliari and the Catholic University „Sacro Cuore" in Milan.
Other university post-degree courses are intended for „Environmental Health Inspectors" and „Safety and Environment Officers" at the Faculties of Medicine and Surgery of the

Universities of Chieti and Genoa respectively, as well as courses intended for „Environmental Health Officers“ at the Universities of Bari and Pavia. All these courses have a two-year duration and require an entrance examination.
Furthermore, we also notice the existence of specialisation schools and further training post-degree courses. Among the specialisation schools, the courses are „Industrial Safety and Protection“ at the University of Pisa (duration: three years; course requirements: degree in Chemistry, Chemical and Pharmaceutical Technologies, Land Sciences, Biological Sciences, Natural Sciences) and the University „La Sapienza“ in Rome (duration: two years; course requirements: degree in Chemistry, Industrial Chemistry, Physics, Engineering).
Among the further training post-degree courses, we draw attention to the course „Safety and risks prevention in working environment“ at the University „La Sapienza“ in Rome.
Concerning the environmental sector, further training courses offered are „Environmental Law“, at the University of Bologna and „Quality control, certification, analytic reference“ at the University „La Sapienza“ in Rome. These courses started during the academic year 97/98.

5.1.5 Current situation of professional training in the sector

Professional training aimed at young people can be divided in three different levels, according to the following cases:

- Young people who have already achieved their scholastic obligations and are registered unemployed (Level I);
- Young people who already have a professional qualification or higher education diploma and are registered unemployed (Level II);
- Graduates unemployed and looking for a job (Level III).

The first level training activity provides the basic knowledge necessary for carrying on a working activity. Once the students pass the final examination, they obtain certificates from the Regions, according to which the job centres assign the levels of qualification that will enable the starting of a working activity and professional inte0gration. The possession of such certificates allows one to enter public competitive examinations.
Example: Public course for the diploma of „Environment Energy Safety Officer“ (topic: Environmental and industrial safety) aimed at young people looking for a first job and the unemployed – Alessandria (Piemonte) 1997. The course was initiated by the „Consorzio Giovani 2000“, duration was 800 hours and required full-time attendance, as specified in the final certificate.
The Level II training activity aims at the acquisition of in-depth knowledge and skill or superior qualification. The training can involve: (a) qualification, (b) updating, (c) specialisation. Like the first level training programme, a certificate is issued at the end of the course, which allows one to enter public competitive examinations.

Examples:

The public course for the diploma of „Industrial risks safety and protection co-ordinator“ (topic: Industrial and environmental safety), aimed at the long-term unemployed and young people looking for a first employment – Latina (Lazio) 1997 (duration: 700 hours).
The public course for the diploma of „Quality, Safety and Environment systems introduction expert“ (topic: Quality and certification, environmental and industrial safety), aimed at young people looking for a first employment – Arezzo (Toscana) 1997 (duration: 400 hours).

Furthermore, there are several courses aimed at the unemployed and young people who have a higher education diploma or degree and are looking for a first job.
Among the courses carried out in 1997 (and 1997-98), it is worth pointing out the difference (even if we would reserve the right to make a precise classification after studying the contents of the training offered in detail) among: (a) courses concerning industrial safety, (b) environmental courses, (c) courses concerning both aspects.

Among the different public courses concerning industrial and environmental safety, category (a), we point out:

- Safety Experts Legislative Decree 626/94 / Duration: 700 hours / Type: full-time / Final certification: qualification / Venue: Naples (Campania) / CNOS FAP – Rome;
- Safety, Environment and Health Officers / Duration: 600 hours / Venue: Naples (Campania) / CESVITEC – Naples
- Safety and Environment Officer / Duration: 600 hours / Final certification: qualification / Venue: Pozzuoli (Campania) / L'ALTRITALIA Ambiente – Naples;
- Industrial Safety Professionals / Duration: 400 hours / Type: full-time/ Final certification: attendance / Venue: Vietri sul Mare (Campania) / SDOA – Vietri sul Mare (SA);
- Industrial Safety Expert / Duration: 664 hours / Type: full-time / Final certification: attendance / Venue: Turin (Piemonte) / CONSORZIO USAS – Turin;
- Safety Experts Legislative Decree 626/94 / Duration: 700 hours / Type: full-time / Final certification: qualification / Venue: Bari (Puglia) / CNOS FAP – Rome;
- Safety technical self-learning / Duration: 300 hours / Type: full-time / Final certification: qualification / Venue: Massa (Toscana) / BIC Toscana – Massa;
- and, particularly aimed at women:
- CE Rules Safety Officer / Duration: 800 hours / Type: residential full-time / Final certification: qualification / Venue: Briatico (Calabria) / ANAP Calabria – Briatico (VV);
- concerning sanitary and health:
- Environmental quality and safety expert Officer / Duration: 820 hours / Type: full-time / Final certification: qualification / Venue: Lodi (Lombardia) / Consorzio per la costruzione del Milano Ricerche Centro per l'Innovazione - Milan;
- Environmental quality and safety expert Officer / Duration: 820 hours / Type: full-time / Final certification: qualification / Venue: Milan (Lombardia) / Consorzio per la costruzione del Milano Ricerche Centro per l'Innovazione - Milan.
- The courses we mentioned are of different duration and require in most cases full-time attendance. In some cases the payment of an enrolment fee is required, as well as a degree in certain subjects (e.g. to attend the course for the diploma of Industrial safety and prevention expert, at the initiative of the Provincial Administration in Foggia, a diploma or degree in a technical branch is required.
- Duration of course: 700 hours / Venue: Foggia (Puglia) / Type: day part-time / Final certification). The courses conclude with the issue of an attendance or qualification certificate.

Among the courses concerning planning and management, category (b), we point out:

- Environmental management Officer for SMEs / Duration: 500 hours / Type: full-time / Final certification: qualification / Misc.: travel and board expenses allowance / Venue: Isola del Liri (Lazio) / Isola del Liri Town Council – Isola del Liri (FR);
- Eco-management and environment system Officer / Duration: 928 hours / Type: full-time / Venue: Como (Lombardia) / Textile Association in Como – Como;

- Junior Eco System Manager / Duration: 700 hours / Venue: Treviso (Veneto) / Treviso Technology;
- or regarding the energy subject:
- Energy Management Officers in SMEs / Duration: 600 hours / Venue: Naples (Campania) / CESVITEC – Naples.

Besides the public courses of different duration and planning, we have to add a few private courses. For example, among courses concerning quality and certification, we point out the:

- Qualification Course for the diploma of „Environmental Auditors/Eco-auditors“, aimed at persons employed in small and medium enterprises, big enterprises and public administration. Duration of the course: 48 hours / Type: full-time / Venue: Rome (Lazio) / Q Quaternaria / Entrance requirements: high education diploma, degree, environmental sciences, technologies and regulations knowledge / Final certification: qualification / Enrolment fee: Lit. 3.300.000.
- Course for the diploma of „Industrial Protection and Prevention Service Officers“, aimed at employees responsible for industrial safety. Duration of the course: 60 hours / Venue: Ravenna. The course was arranged by A.F. Forum in co-operation with Centro Ricerche Ambientale in Montecatini and financed by the Emilia Romagna Region.

Among the few courses concerning quality and certification, industrial and environmental safety, category (c), we point out

- the public course for the diploma of „Safety, Quality and eco compatible Management SMEs Consultants“ (Duration: 500 hours / Type: full-time / Final certification: qualification / Venue: Chieti (Abruzzo), at the initiative of ASSEFOR – Florence.

The third level training activity, aimed only at graduates, is the most interesting for the SEQUI Project. Even at this level, courses can end with the issue of a qualification certificate.

Among the category (a) public courses we point out:

- Master in Safety Engineering / Duration: 1200 hours / Type: full-time / Final certification: specialisation / Enrolment fee: Lit. 1.680.000 / Venue: Turin (Piemonte) / Misc.: the course ends with the issue of a Master’s Degree in Safety Engineering / COREP – Turin, particularly aimed at women:
- Industrial and Environmental Safety / Entrance requirements: degree, residence in North Italy / Duration: 700 hours / Type: full-time / Final certification: attendance / Venue: Trento (Trentino Alto Adige) / FIDIA – Milan.

Among the category (b) courses:

- Eco-management and Environmental Audit / Entrance requirements: technical degrees / Duration: 400 hours / Type: full-time / Final certification: specialisation / Misc.: travel and board expenses allowance / Venue: Pisa (Toscana) / Consorzio Pisa Ricerche;
- Master in Environmental Engineering / Entrance requirements: degree, residence in Puglia / Duration: 800 hours / Type: residential full-time / Final certification: attendance / Venue: Taranto (Puglia) / CSEI Politecnico in Bari;
- Ecomanager / Duration: two-year 800 hours / Type: full-time / Final certification: qualification / Venue: Udine (Friuli Venezia Giulia) / IAL Friuli Venezia Giulia – Pordenone;

- European Master in Environmental Management Training / Entrance requirements: degree, knowledge of English or French / Duration: 2400 hours / Conditions: residential full-time / Final certification: specialisation / Enrolment fee: 3000 Ecu / Venue: Varese (Lombardia) / Misc.: repeated course arranged in different modules at several Universities in Italy and abroad / EAEME – Varese
- European Master in Environmental Engineering / Duration: 1400 hours / Type: full-time / Final certification: specialisation / Venue: Turin (Piemonte) / Misc.: at the end of the course a Master's Degree in Environmental Engineering is issued / COREP – Turin.
- and, concerning energy:
- Expert in the environmental and energy management of industry / Duration: 800 hours / Type: residential full-time / Final certification: attendance / Venue: Bari (Puglia) / CSEI Politecnico in Bari.

Among the category (c) courses:

- Safety, Environment, Quality Business System Management Officer / Entrance requirements: technical or economic degree / Duration: 1200 hours / Type: full-time / Final certification: qualification / Enrolment fee: Lit. 300.000 / Venue: Modena (Emilia Romagna) / EFESO – Bologna;
- Safety, Environment, Quality – Integration Business Experts / Entrance requirements: technical – scientific degree / Duration: 900 hours / Type: full-time / Final certification: qualification / Enrolment fee: Lit. 300.000 / Venue: Bagnacavallo (Emilia Romagna) / IL SESTANTE – Ravenna;
- Business Eco-management Responsible / Duration: 1000 hours / Type: full-time / Final certification: qualification / Enrolment fee: Lit. 300.000 / Venue: Rimini (Emilia Romagna) / NUOVO CESCOT – Bologna;
- Quality Systems Expert Course / Entrance requirements: technical or economical degree / Duration: 800 hours / Type: full-time / Final certification: attendance / Misc.: scholarships / Venue: Salerno (Campania) / SDOA – Vietri sul Mare (SA);
- Industrial Safety and eco compatible Management SMEs Consultants / Duration: 400 hours / Type: full-time / Final certification: qualification / Venue: Campania;

and, concerning energy:

- Public course for the diploma of „Environment Energy Safety Officer" (topic: energy, environmental and industrial safety) / Course typology: adults specialisation / Participants: unemployed / Duration: 900 hours / Type: full-time / Final certification: specialisation / Venue: Turin (Piemonte) / ENFAP Piemonte – Turin;
- and, particularly aimed at women (course typology: adults specialisation):
- AQS - Safety, Environment, Quality – Integration Business Officer which took place in Ferrara (Emilia Romagna) at the initiative of MATHEMA Professional and promotion training centre (Final certification: specialisation).

It is worth noting that there are differences in the duration and organisation of several post-degree professional training courses. We also highlight the attention devoted to the „energy" subject and matters concerning the observation of environmental rules.
Moreover, we would add that initial data about the new courses (1998) show how the Regions are aiming at promoting and financing courses concerning not only industrial safety but also a different approach to quality and environment integration.

5.1.6 Digression: Sample data related to Emilia Romagna

To get an idea of the variety of activities carried out at regional level, it is useful to consider the different activities related to safety, quality and environment financed by Emilia Romagna, one of the training leader Regions in 1997 and 1998.
According to the data processed by the Training Assessorships (Assessorato alla Formazione), there are 516 activities financed by the Region in 1997. Among them are:

- AQS - Safety, Environment, Quality – Integration Business Officer (Duration: 900 hours)
- Quality assurance and management in agribusiness (Duration: 1.100 hours)
- Safety and Environmental Officer (Concerning the project „Safety, Environment, Quality – Integration“, duration: 800 hours)
- Safety, Environment, Quality Business System Management Officer (Duration: 1200 hours)
- Quality Control and Assurance Officer (Duration: 1000 hours)
- Officer responsible for prevention and protection service inside and outside the enterprise for the improvement of healthcare in workplace (Duration: 1000 hours)
- Transformation industry Officer with expertise in sanitary quality (Duration: 600 hours)
- Industrial enterprises technical staff with main expertise in safety and ecology (Duration: 900 hours)
- Quality Assurance Officer (ISO 9000-Uni En 29000 Regulations) (Duration: 900 hours)
- Quality Control Officer (Duration: 1000 hours)
- Quality Assurance Officer (Duration: 1100 hours)
- Fruit and vegetable Division Quality Supervisor (Duration: 640 hours)
- Agro-mechanical activity safety Officer (Duration: 700 hours)
- Industrial safety and health expert (Duration: 1200 hours)
- Quality Officer (Duration: 900 hours)
- Foodstuffs quality expert consultants (Duration: 700 hours)

For the year 1998, 345 activities concerning safety, environment and quality were financed. As they offer a great contribution to post-degree training and underline the tendency towards quality, safety and environment integration, we would like to mention:

- Quality Control Officer (Duration: 800 hours)
- Quality Assurance Officer (Duration: 1000 hours)
- Safety and Quality Control Officer (Duration: 800 hours)
- Quality Assurance Officer (Duration: 450 - 350 – 800 hours)
- Quality Control Officer (Duration: 800 hours)
- Quality Assurance Officer (Duration: 800 hours)
- Quality, Safety, Environmental Systems Expert (Duration: 640, 160, 800 hours)
- Quality Assurance and Management in Agribusiness Expert (Duration: 700 hours)

5.2 Report from Austria[4]

Definition:

Safety management[5] means taking all measures necessary to reach and constantly improve legal and personal goals in health protection and work safety at every work place.
Environmental management means taking all measures necessary to reach and constantly improve environmental quality and personal environmental goals with regard to the economical aspects. Environmental management systems must prove their fulfilment of the EC Ordinance 1836/93, the so-called EMAS Ordinance (also called Eco-audit) and ISO-Standards 14001.
Quality management means fulfilling the customer's requests and expectations. It also means taking all measures necessary to plan and implement quality with regard to economical aspects, and carry out success control. Quality management systems must prove their fulfilment of the ISO-Standards 9000ff. This proof is furnished with a certificate from an accredited certification authority.
All these measures to increase quality have the following results:

- work techniques and processes are planned,
- plant safety is increased,
- work safety is increased through instructions of the employees.

The existing ISO standards for quality and environment management systems are compatible. Also the EMAS ordinance can be combined with a quality management system. The employee protection law touches on a management system and therefore can be integrated into other systems. In the construction phase and daily business processes, work can be simplified by avoiding various paperwork and optimising the production conditions. In this way the productivity, efficiency and consequently turnover and profit of a business are increased.

This chapter gives an overview of the existing education/formation in the areas of safety, environment and quality control.
In order to identify the „compound„ of training opportunities available in Austria, we divide them into

- **private** institutes,
- **corporate** training institutes of employer's and employee's associations (mainly the Chamber of Labour and the Chamber of Commerce)
- public institutes in **universities** and polytechnics

In addition, they are divided into

- **accredited (A) and**
- **non-accredited (NA) suppliers of formation.**

[4] by FACTUM &CSI
[5] cp. Paulesich R., Wallisch F.X.: ein Managementsystem für den Arbeitsschutz, Eigenverlag der Wirtschaftsuniversität wien, 1997, S.34ff

The following list provides a sample of training opportunities, curricula, attendance and impact.
As far as subsequent work on existing curricula is concerned, one point has to be made in connection with the discussions led here: It will be difficult to put SEQUI-experts in front - or above - the experts who already work now in one of the three areas. A more probable outcome of offering an integrated education would be that experts in one of the three fields learn more about how to integrate them. The advantage of this would be a more holistic view on things, enhancing synergy. The disadvantage could be that existing experts without SEQUI training would have acceptance problems when a colleague from another area becomes the „super expert„. This situation will be discussed in more detail.

5.2.1 Safety personnel

There are two existing professional profiles in Austria:

- **the safety officer and**
- **the confidential person for safety.**

The safety expert

The safety expert works „on the side of the employer„. His/her education is rather extensive, namely 288 formation units (each „hour„ is 50 minutes) at the moment (1997/1988). Since the implementation of the employees protection law (ArbeitnehmerInnenschutzgesetz - ASchG; Bundesgesetzblatt über Sicherheit und Gesundheitsschutz) on January 1st 1995, training has been legally standardised (277. SFK-VO).
Only persons who have received a certification according to regulations issued by the Ministry of Labour, Health and Social Affairs (§3 SFK (BGBl 278/1995) after the formation are allowed to call themselves safety officers. Safety personnel are controlled by the labour inspectorate (Arbeitsinspektorat).

Confidential person for safety

The confidential person for safety works on the employees' side. He/she should motivate them to comply with safety rules and also see to it that safety regulations are observed by the employer; his/her education is much shorter: 24 units (no information about follow-ups). The formation is legally based on the employees protection law (ArbeitnehmerInnenschutzgesetz - ASchG; SVP-VO.) A person who has been named by the employer can undergo the formation.
In enterprises, safety councils should be established to discuss safety matters. They would consist of: employer (or representative), safety expert, labour physician, confidential person for safety and works council representative, and perhaps personnel development & education (in case of health issues).

Educational contents

The educational contents for both groups - expert and confidential persons for safety - are:

a) Topics: Noise, dust, explosives handling, poisonous materials, laser and radiation hazards, ergonomics

b) Areas: Working medicine, organisational psychology, sociological background to the protection of employees, cost-effectiveness aspects, motivational psychology and communication, risk identification and risk evaluation
c) Strategies/activities: Evacuation plans and strategies, handling of dangerous materials, protective strategies

Depending on the type of work performed in business, there are extra courses on special topics (noise, dust, explosives, electricity, as well as organisational psychology, etc.). Moreover, there are courses for company owners and managers and labour physicians (e.g. computer-aided evaluation of working places, 8 units at the cost of ATS 3.000.- in 1998) that should help them understand safety problems and motivate them to comply with regulations (e.g. seen from the perspective of cost-effectiveness and cost-efficiency).

5.2.1.1 Prerequisites and institutions offering courses

Safety Officer
According to §74 AschG, only persons who have sufficient basic education in the technical field and enough practice („several years„ of working experience) are allowed to attend special formation courses. Persons who do not fulfil these prerequisites (e.g. a degree from a polytechnical high school) have to undergo an admission test..[6]
Only persons who have received a certificate according to §3 SFK (BGBl 278/1995) issued by the Ministry of Labour, Health and Social affairs after all formation activities may call themselves Safety officers (SFK). Work place evaluation is carried out by both internal and external SFK. The way to education and formation is the same in both cases and carried out according to SFK-VO (BGBl. 278/1995) §3.
Accredited suppliers of formation:

Private
- (A)7 Forum Gesundheit (=Health) PPM in Linz, duration: 40 days, 48.000 ATS
- (A) TÜV (Technischer Überwachungs-Verein = Technical Monitoring Association), Vienna, 5 modules, duration: 41 days, 49.500 ATS8

Corporative
- (A) Berufsförderungsinstitut (Professional Development Institute) BFI Austria
- (A) Wirtschaftsförderungsinstitut (Business Development Institute) WIFI der Wirtschaftskammer (Chamber of Commerce) Austria, duration: 54 days, 33.500 ATS.
- (A) Allgemeine Unfallversicherungsanstalt (General Accident Insurance Institution) AUVA, 4 modules, duration: 312 Units, no information about the costs available

Universities
- (A) NÖ. Landesakademie (Academy of the Federal Country of Lower Austria) together with the Technical University of Vienna, in St. Pölten, 2 half-years, 48.000 ATS[9]

6 http://ebweb.tuwien.ac.at/schwende/aschg/aschg_7.htm
7 (A) - accredited
8 TÜV österreich http://www.tuev.or.at/manage2.htm
9 Lehrgänge NÖ Landesakademie http://lak.noe.gv.at/lehre/lg01.html

Confidential person for safety

The prerequisite for the confidential person for safety is, according to the course information, „interest in safety issues„. Legal basis: according to ASchG by SVP-VO. Persons nominated by the employer may attend. There are many suppliers, two of them are:

Private
- (NA) human ware in Vienna, Workshop, duration: 3 days, app. 6.900 ATS

Corporative
- (NA) WIFI Austria, duration 2 to 3 days, app. 2.500,- ATS

5.2.2 Environmental Management and Quality Management

In Austria quality managers QM and environmental managers act on three different levels of qualification:

- As internal QM viz. Responsible for environmental issues, without ISO-Certification viz. European EMAS-Regulation of Service suppliers. The profiles of qualification and the activity catalogues are defined by the enterprises themselves.
- As „internal QM-Auditor„ viz. „internal Eco-(ÖKO)-Auditor„ where certain ISO-Certifications or EMAS-Regulations can be fulfilled by the enterprise; there are no legal regulations for the formation but the qualification profile has to comply EMAS-regulations and ISO-Certification.
- As „certifying Auditor“ („Topic Auditor„, „Environmental Auditor„, „external Auditor„, etc.; the Austrian Association for Quality assurance (ÖVQ) recommends the term „Auditor„ as opposed to „Internal Auditor„) of enterprises who acts according to ISO-Standards viz. EMAS-Regulations.

Personnel in charge of environmental matters

The definition of the function of officers who are responsible for Environmental Management is unclear due to many different and heterogeneous titles and types of formation and education. One finds titles like: environmental managers, environmental delegates, internal auditors, external auditors, topic auditors, environmental assessor, eco-auditor, environmental appraiser, responsible for environment matters in the enterprise, etc.
Formation for environmental management is possible on three levels (this recommendation is made by the ÖVQ, the Austrian Association for Quality Management, the only formally accredited supplier of formation in the field):

Authorised environmental representative
There are many suppliers of formation for the environmental representative. More than 100 Öko- (= eco-) consulting companies have *„carried out almost 900 formation courses or seminars during the last five years„*[10].
- Internal auditor
- Auditor (= „Environmental expert„ or „Environmental appraiser„)[11]

10 Umweltbundesamt: http://www.bmu.gv.at/oeko-consult/H_www80.htm
11 Anm.: Title through the BMWA)

Internal auditors and auditors include the specialists called „Abfallbeauftragte„ = Representatives responsible for waste management. All companies larger than 100 persons must provide this function.

5.2.2.1 Prerequisites and institutions offering courses

The prerequisite for the courses is that the enterprise elects the person as responsible for environmental issues according to the different laws.
Formation standards have been developed by the „Arbeitsgemeinschaft Energieberater„ ARGE EBA (Task force Energy consultants) which is active in all parts of Austria. These standards have a very clear environmental focus.
The following suppliers comply with the standards concerning time of day (there are day- and evening courses), duration (3 modules in 5-7 weeks) and cost (app. 30.000 ATS):

- (NA) Umweltberatung Österreich (Environmental Consultation Austria)
- (NA) Energieinstitut O.Ö. (Energy Institute of Upper Austria)
- (NA) Energie Tirol (Energy Tyrol)
- (NA) Energieversorgung NÖ EVN (Energy Supplier Lower Austria EVN)
- (NA) Arbeitsgemeinschaft der erneuerbaren Energie (Task Force for Renewable Energy)
- (NA) Energieinstitut Vlbg. (Energy Institute Vorarlberg)

5.2.2.2 Educational contents for internal auditors and auditors

Educational contents for both groups generally include the following topics:
- ethics
- communication techniques
- polymer engineering
- physics, chemistry and ecology
- manufacture and processing engineering
- informatics and control engineering
- analytical chemistry and environmental analytic
- processing, energy and environmental engineering
- toxicology
- emission and water protection
- environmental laws
- waste management and environmental economy
- economy and environmental management
- practical work

5.2.2.3 Prerequisites and institutions offering courses for auditors

The auditor (= „environmental expert„ or „environmental appraiser„) requires certification according to ISO 14 000ff viz. EMAS-Regulation; the certification mode is standardised in the law expert decree of environmental auditors and list of locations (Umweltgutachter-und Standorteverzeichnisgesetz UGStVG). *The responsible authority is the Minister of Trade, who has to co-operate with the Ministry of Environment involved (depending on the type of*

company/enterprise)[12] (The responsible authority in detail: Ministry of Trade, Section IX/Division 2, in accordance with the Ministry of Environment, Youth and Family).
Laws & regulations: Accreditation law (Akkreditierungsgesetz AkkG), Bgbl. Nr. 468/1992 idF. 430/1996[13], European Norm Series EN 45 000.
As mentioned above, the ÖVQ is the only accredited supplier in Austria.

Private institution

- Österreichische Vereinigung für Qualitätssicherung (Austrian Association for Quality Management) ÖVQ formation course: „Environmental Management„ according to ISO 14001 viz. EMAS Regulation; qualification: certificate environmental manager, duration: 10 days, cost: app. 22.900 ATS (for non-members); 2 modules:

Environmental Management Systems, 40 hours
Tools for Environmental Management, 40 hours
⇓
Exam: Environmental Manager, 2 days exam, validity of certificate: 3 years
⇓
Exam: Environmental Appraiser (Candidate) 1 day
4 years of professional experience, of these 2 years as internal auditor + 5 eco-audits carried out under his/her responsibility
⇓
subsequently: certificate as environmental appraiser, validity: 3 years[14]

Corporative

- (NA15) Wirtschaftsförderungsinstitut der Wirtschaftskammer Österreich WIFI (Business Development Institute, Chamber of Commerce Austria). Course: „Internal Environmental Auditor„ according to ISO 14000 viz. EMAS-Regulation, duration: 9 days; cost: 19.800 ATS
- Environmental Management, 1 day
- Intensive formation Environmental Management, 5 days
- Examination Workshop: Internal Environmental Auditor, 3 days16
- (NA) Berufsförderunginstitut (Professional Development Institute) BFI Austria Wien, Course: „Environmental Company Representative„, duration: 140 units, cost: 28.500 ATS
- (NA) HTL (Technical Highschool) „Rosensteingasse„ in Vienna, formational focus: technical chemistry - environmental technology, duration: 5 days, professional profile: chemical engineering
- (NA) Fachschule (Professional Highschool) Ispertal: Technical Highschool in Lower Austria, Focus on Environmental Management

Universities

- (NA) Technische Universität Wien (Technical University Vienna)
- (NA) Technische Universität Graz (Technical University Graz): discipline „Environmental Systems Sciences„

12 Accrediting service wysiwyg://main.52/http://www.bmwa.gv.at/positionen/akkredit.htm
13 Accrediting service wysiwyg://main.52/http://www.bmwa.gv.at/positionen/akkredit.htm
14 Österreichische Vereinigung für Qualitätssicherung: Integrierte Managementsysteme, Qualität-Umwelt-Sicherheit, Kursprogramm 99, Dok.Nr. 01, Ausgabe 10/98
15 NA = not accredited
16 WIFI Österreich: Internal environment auditor, broschure, no year stated

- (NA) Wirtschaftsuniversität Wien (University of Economy Vienna), Interdisziplinäres Institut für Umwelt und Wirtschaft (Interdisciplinary Institute for Environment and Economy) IUW; optional subject (general lecture, exercises, pro-seminar, special lecture): „Environmental economy„ 17
- (NA) NÖ. Landesakademie (Academy of the Federal Country of Lower Austria) in St. Pölten, 2 terms of education

5.2.2.4 Personnel in charge of quality management matters

We need to consider the very differences that might arise when we compare training courses in these areas. Some distinctions obviously need further clarification:
There are *„QM„ (Quality Management)* and *„QA„ (Quality Assurance)*. In the three countries involved in the SEQUI Project, institutions offering training of this kind however may not apply the same definitions. QM/QA is also not always clearly distinct from the Human Resources Development. Moreover, the contents and utilisation of vocational training and education in these areas vary a lot depending on the institutions.
Like in Environmental Management, there are no clear professional labels in Quality Management: quality auditor, quality assessor, quality manager, quality representative, quality technician, quality instructor, subject auditor, internal quality auditor, external quality auditor, certificating quality auditor; there are even more labels than that.
Formation for Quality Management is possible on three levels (analogous to Environmental Management):

- quality representative
- internal auditor
- auditor

5.2.3 Educational contents for internal auditors and auditors

Educational contents include ISO-norms (9000 ff, 10011), certification procedures, cost-efficiency and cost-effectiveness aspects, implementation aspects, assessment procedures, legal aspects and an overview of the institutions offering support for certification procedures. Further details are summarised in the course of work.

- Relevance of Quality Management for the Enterprise (Process model, Motivation, Information, Quality enhancement, Surplus value, Optimisation, Quality guidance, Cost factors)
- Tools and Methods (Evaluation of QM systems, Accreditation and Certification, Environmental Management)
- Statistical methods

5.2.3.1 Prerequisites and institutions offering courses

Registration as a certificating QM is not subject to any national legal norm. The Department of Trade is the examining and supervising institution. For the registration of persons as QM it

17 Interdisziplinäres Institut für Umwelt und Wirtschaft: http://www.wu-wien.ac.at/inst/iuw/lv/wahlfach.html

adopts the standards in the guidelines for European Co-operation for Accreditation EA[18] and International Accreditation Forum IAF, both are obligatory for certification.
To become a Certificating Quality Auditor according to ISO 9000ff, viz. EMAS Regulation, one has to undergo an examination procedure with certification authorities for personnel according to EN 45013, accredited by the Department of Trade.
Accredited institutions for the formation and examination of „Auditors„ in the area of QM are:

- ÖVQ[19] (Internal and External Auditor = the certification authority for QM Subject Auditors confers the auditor‘s certificate) and
- WIFI Austria (certification as internal auditor)

Private

- Österreichische Vereinigung für Qualitätssicherung (Austrian Association for Quality Management) ÖVQ, courses for the internal and external auditor, qualification: certificate, duration: 12 days, cost app. 35.300 ATS, 4 modules: (see the following page)
- (NA) TÜV Österreich Akademie, Wien (Technical Monitoring Association, Vienna), 5 modules, duration: 14 days, cost: 29.600 ATS excl. examination fee.

ÖVQ: Courses for internal and external auditors

⇒QM Systems and Internal Audit, 40 hours
⇒QM Systems and Practical Application, 40 hours
⇒Statistical methods for the preparation of decision taking, 32 hours
⇒Technical QM for the improvement of enterprise processes, 40 hours
⇓
Exam: 2 days, Certificate: Quality Manager
⇓
Course: QM-Auditor, 40 hours, (Candidate), cost 19.500 ATS (for non-members of ÖVQ)
⇓
Exam: 1 Tag, certificate: Auditor (Candidate)
⇓
4 years of professional experience, of these 2 years as QM + 5 audits carried out under his/her responsibility
⇓
Certificate: Auditor, Validity: 3 years
⇓
Possibility of achieving the certificate of the EOQ (European Organisation for Quality)-:
Acknowledgement in 31 countries, 3 graded structure:

- EOQ Quality Professional
- EOQ Quality Systems Manager
- EOQ Quality Auditor

18 Accrediting service wysiwyg://main.52/http://www.bmwa.gv.at/positionen/akkredit.htm
19 Bundesgesetzblatt für die Republik Österreich, issued on 29. July 1998, Teil II, P.b.b. published in Vienna

Corporative

- (A) WIFI Österreich, Course: Quality Representative for SME Qualification: Internal Auditor, duration: 13 days incl. exam, cost: 25.500 ATS, 6 modules:

⇒Information evening
⇒Management of leadership processes, 3 days
⇒Management of business processes, 3 days
⇒Management of supporting processes, 3 days
⇒Workshop + exam, 1 day
⇓
Certificate: Quality Representative for SME
⇓
Internal Auditor, 3 days
⇓
Certificate: Internal Auditor

Due to a co-operation contract, the WIFI-Certificates „Quality Representative for SME„ are acknowledged by the ÖVQ as equivalent to the EOQ formation model[20]

University

- (NA) Wirtschaftsuniversität (Economical Univ.) Wien, Institute for Information processing and Information economy, Division of Industrial Information processing pro-seminar (2 hours weekly for 1 term): Quality Management pro-seminar: Technical QM, Models & Methods[21]

20 WIFI Österreich:Qualitätsmanagement Weiterbildung 98/99, Wien
21 Wirtschaftsuniversität Wien http://indi.wu-wien.ac.at/

5.3 Report from France

5.3.1 Training practices and perspectives[22]

5.3.1.1 Training practices

Problematic

French training organisations have shown their desire and commitment to contribute to the development of quality-safety-environment politics in the business world. If this pluralistic dimension is making itself known and surpassing certain barriers in the scientific and university fields, it seems we haven't reached that stage for business yet.
We can see, however, that their needs in relation to risk prevention are taking larger and larger dimensions as the necessary interdependence between the efficiency of personnel and of organisation becomes clear. It's no longer a question here of a more or less ecumenical voluntarism idea; again and again **the evidence proves a strong link between human performance and the performance of different social systems.**
This 'systemic efficiency' is based on :

- Application of regulations,
- Conformity to the norms in force,
- Analysis of the organisation and work system,
- The capacity of the organisation to take action on the issues,
- Opening to new skills, found internally or to be constructed.

Apparently, the necessity of developing training actions in these fields is aware by everybody. Apart from the training and teaching functions, however, **the training organisations appear as bringers of projects**. These projects aim not only at conformity to the regulations but also at **the protection of people's health at work and in their daily lives**. This is done by taking action on professional risk, quality and environment.
However, apart from the singularity of their aims, training practices, we have noticed, do differ because :

- they address to diverse groups, ages, maturities, levels of education (post A-levels to post university)
- some of them favour one of the domains at the expense of the other two.
- they place a more or less important emphasis to national or international type teachings.

Consequently, training practices do not emphasize the same skills or knowledge, and this puts into question the **expected skills in relation to Q.S.E.**

22 Summary of the participants' contributions by Eric Cattaruzza and Sophie Lefeuvre, European Consultants.Sequi seminar 09/04/99, Nantes, France

Trained in what ?

Experts and generalists alike in these different fields intermingle and compliment each other. Companies need different people at different times. In this way, apart from the specifications of each scientific or technological field, **a teaching program in terms of problem resolution seems to be indispensable. This type of program can help in articulating a cross-disciplinary training project**.
So, in face of the diversity and complexity of the different situations of different companies, the question, it seems to us, is to know :

- What is the particularity of the Q.S.E. approach?
- Is it different from a Q+S+E approach ?

The answer to this question is "yes" because the very notion of the term 'cross-disciplinary' evokes this distinction. But perhaps we should more precisely identify its foundations and methods. We should then reflect on the existence or non-existence of similar tools (norms, programs of analysis, of auditing, of diagnosing…), common prescriptions, identical models of work organisation, … ?

Trained to do what ?

Apparently, if the question of an integrative approach is posed today, it would be a good idea for the network of schools represented to delve deeper in this problematic because it seems to correspond to 'evident' expectations on the part of businesses.
For sure, experts or generalists in the field of Q.S.E. need to demonstrate a large capacity to adapt, necessitating, it seems to us, the existence of solid pre-requisites. These capacities of adaptation are concerned not only with the ability to pass from one field of action to another and make the connections when the situation demands it, but also the ability to resolve 'simple' problems as well as more complex ones.

What place to give them in a company ? Which hierarchical level ?

Evidently, an individual with A-levels and a 2-year diploma cannot expect to have the same professional status as someone with a post-graduate diploma. This is not only due to the difference in their levels of knowledge and experience but also in their level of maturity. Here as well we can see a big difference in the practices of different companies who tend to underestimate the skills required in relation to the difficulty of the task !

What do the companies and the organisations think ? What are their needs ?

In the fields that we are dealing with here companies and organisations are faced with a significant and complex arsenal of regulations, norms and methodologies.
The noted contributions show that their demands favour one of these three : safety, environment or quality. This can be translated as a fragmented approach to the particular needs when, evidently, each of the three fields can be implicated in the answers.
In parallel, the response of companies in relation to employment is somewhat limited for the higher levels of qualification. They tend to favour contractual employment as though they haven't understood the long-term benefits of a Q.S.E. approach, thereby reducing it to its simplest instrumental function.
Are they ready to embark on a Q.S.E. program ? Certainly, seeing how certain trainees have fared, however on the condition that they can understand and measure the interest of this type of program and new skills.

The validation of these skills no longer relies upon the unique guarantee offered by a diploma but the social utility of the future expert.

5.3.1.2 Perspectives

Don't the different training actions in the Q.S.E. approach only reproduce the practices that already exist in terms of prevention ? Isn't it possible to imagine a group of organisations where some of them would develop fundamental knowledge in the three fields Quality, Safety, and the Environment while the others would develop cross-disciplinary contributions for the entire group Quality/ Safety/ Environment ?
From our point of view the development of training for experts in Q.S.E. necessitates :

Concerning the players :

That the social players position themselves in relation to a Q.S.E. risk management in order to define the general directions to take and establish a validation of the necessary skills.

Concerning the training :

- The construction of an articulated and coherent training program where each player in the training can find their place and particularity,
- A synergy of the players in the training (institutions, chambers of commerce, training organisations) anchored on concrete projects, which consequently implies listening to the companies who are in fact the real initiators of projects.

Concerning the means :

- The consequent development of information on Q.S.E. risk management in business,
- The development of networks (inter-schools, inter-CRCI…) allowing information, knowledge and practical skills to be capitalized in order to analyse and respond to the companies' constraints,
- The development of financial aid to allow companies to undertake and follow through Q.S.E. risk management projects,

One can confidently say that the field of Q.S.E. expertise is growing little by little. What seems to us necessary at this stage is to bring the diverse initiatives closer together and also to create a real synergy between the different players (institutions, businesses, organisations, trainers, 'preventors') who operate in the field of the protection of people, organisations and environment.
This synergy cannot be conjured up but must grow from concrete projects in businesses and other organisations.

5.3.2 Existing training in France

In France, for the last ten years numerous authors and working groups have addressed the theme of the training of '**preventors**'.
A large palette of teaching exists, therefore, which covers the **initial training** (FI) and the **further training (FC)** of these '**preventors'** covering large fields of intervention ; 'safety, industrial hygiene, ergonomic, legislation, the human factor…'

These training are aimed at one or several of the themes, varying according to each case. There is a general orientation towards multi-skilled abilities.
In parallel, a growing number of engineering schools of varied disciplines have integrated a significant sensitivity to safety and industrial risk into their syllabus.
A census of French training organisations in the field of work safety and risk prevention was carried out in 1997 by Denis SERVE, professor at Joseph Fourier University in Grenoble.

Initial training				Further Training or alternating in diverse organisations (long training)		
University establishments		Non-university establishments				
A-levels+2yrs. A-levels+4yrs. A-levels+5yrs A-levels+6yrs.	9 3 17 3	A-levels+2yrs. A-levels+3yrs. A-levels+6yrs.	2 3 1	A-levels+2yrs. A-levels+3yrs. A-levels+4yrs. A-levels+5yrs A-levels+6yrs.	3 1 2 8 1	Training with various levels 4
TOTAL FI 38				**TOTAL FC 19**		

N.B. This table doesn't include subjects coming principally from the environmental field.

The training leads to certificates or diplomas of at least A-levels +2.

5.3.2.1 In the West of France

'How to ensure a cross-disciplinary risk management adapted for small to medium sized businesses, guaranteeing efficacy and value for money ?' This is the question which the players in the training are asking together with the Chambers of Commerce and Industry and the other players in the world of business ; a question that sums up the nascent preoccupations of the SMB which represent the essential economic tissue of the three regions in the west : Poitou-Charentes, Pays de le Loire and Brittany.
Four innovating and complimentary training have been created, anticipating this program of integrating several different skills dealing with risk prevention.

Initial training :

IUT(technological institute) of Lorient – the Department of Hygiene, Safety and the Environment. A-levels+2Dept. Head -Jacqueline Martinet, Tel : 33 2 97 87 28 36

ISAIP.ESAIP Group. Cycle : Safety, the Environment and Prevention. A-levels+5 Training SEP head- Steve O'Brien, Tel 33 2 41 96 65 26

Further training :

Chambers of Commerce and Industry of Vendee : Superior Institute of Safety, the Environment and Quality (ISSEQ) A-levels+3 Training Head- Clement Charrier, Tel : 33 2 51 45 32 00

Institute of Man and Technology (IHT) : Management associated with professional risk, the Environment and Quality in a company.(MARPEQ).Head- Michel Avignon, Tel : 33 2 51 85 74 02

5.4 Comparative Summary

Comparing the three national reports, important national differences appear in the arrangement of course offers.

Safety:
In Austria exist no university courses for legally defined safety specialists till now, the stipulated course duration is 288 units and includes a legally regulated curriculum. The courses are offered in private and corporative course centres. Courses for safety specialists are conceived purely as further training courses and tailored for persons with relevant basic knowledge and work experience. The difference to Italy and France is that although internal courses are legally stipulated as internal training in safety for employees, they are regarded as „instruction„ for employees (the safety manager is in no way regarded as an internal trainer) and have the task of providing advice in safety matters to the management.
According to our observations, questions about employee protection are hardly present as course contents in the field (like ergonomics, architecture...) In Austria however – as opposed to Italy - the so-called work medicine is a legally stipulated integral part of prevention on the job.
Regarding integration with regard to Sequi in the field of training, the project SYNCRO[23], still in its infancy and carried out by the Professional Development Institute Vienna in Austria, shows that initial approaches in the combination of safety and environment management in further training are being conceived and realized.
Italy possesses a more versatile training and further training programme compared to Austria:

- university training and further training with recognized professional entitlement and degree, duration: two years
- environment and safety are already integrated in many places
- safety management as initial course
- training in „Sequi„ management as a measure for work market integration for unemployed persons and disadvantaged groups.
- duration of the courses is 400 to 800 units according to course types.

Like in Italy, training offers in **France** are established in the safety field and also mainly at universities. Most striking of all, initial courses are offered at 32 university facilities. With A-Levels as prerequisite, the courses last between 2 to 6 years and award a diploma or certificate upon conclusion.

[23] SYNCHRO – Trainer`s Guide for Health, Safety and Enviroment, Eu-Leonardo da Vinci, coordinated by bfi Vienna

Table: Training and further training offers in safety management in comparison of countries

Country	Initial training	Professional training	University training	Combination with regard to Sequi	Duration
Austria	no	yes	no	initial efforts	288 units
Italy	yes	yes	yes	yes	400- 800 units
France	yes	yes	yes	yes	2-6 years

Environment and Quality:

In **Austria**, recognised job qualifications in business environment and quality management are offered only as non-university further training. Although various universities offer the relevant lectures, they don't provide training for certified environment and/or quality managers. There isn't even any concrete information about the duration of further training offers since they are conceived in combination with work experience, stipulated and obtained in the mean time. An exception among private training institutions as well as in the integration of the three management systems is the post-university „Quality management course" at the Donauuniversität Krems, which was quoted as a case study in the national report. Although called "Quality management" in the course title, the course however focuses mainly on safety, quality and environmental management.

An Austrian peculiarity, however, is that once acquired, the auditor certificate has a limited validity and consequently must be submitted to a serial accreditation process annually.

As already described in "Safety", **Italy and France** boast a training programme in eco and quality management that Austria can hardly compare with. Among the Italian training and further training offers, the diploma courses „Eco-Auditors„ and „Industrial Protection and Prevention Service Officers„ are worth mentioning, which are at least comparable in course duration to similar Austrian course types. All other course activities mentioned aim for an essentially longer course duration (400 to 1200 units). The French report provides an exemplary account of initial and further training courses from private course institutions (basing on A-Levels).

To summarise, Italy and France show a trend towards training in Sequi management and a sounder training process as in Austria, although in Austria efforts are being undertaken recently.

Table: Training and further training offers in eco and quality management in comparison of countries

Country	Initial training	Professional training	University training	Combination with regard to Sequi	Duration
Austria	no	yes	only one course known	efforts made	n.a.
Italy	yes	yes	yes	yes	400-1200 units
France	yes	yes	n.a.	yes	A-Level + 2-5 years

6 Results of interviews

In the following section, an attempt is undertaken to identify the occupation profiles in SME in the fields of safety, quality and environment and also carry out an analysis of the training needs.
Using questionnaires, the **Italian team** carried out 22 interviews, the **Austrian team** 14 and the **French team** 28 interviews.
68 interviews are therefore excerpted in the present report and contains quantitative and qualitative data-analysis.
The analysis by Sabrina Bandini throws light on the structure and methodology of the questionnaires.

6.1 Report from Italy

6.1.1 The impact of community quality, safety and environmental regulations on SME's in Italy[24]

6.1.1.1 Sustainable development and its implications for companies

Starting at the end of the 1980's, international and community policies have led to a review of the regulations governing the market and the role and responsibility of companies. These are now expected to help in making development sustainable – in other words, to work for economic growth that will satisfy the fundamental social requirements of the human person and, at the same time, respect the environment.
Sustainable development, which is now the guiding principle for international co-operation and action, necessitates a full examination of the more traditional regulations for worker safety and more recent regulations aimed at guiding the market.
The evolution of Community law in this field has clearly had an impact on small and medium-sized companies, and this now needs to be evaluated for these companies play a vital role in European industry. In Italy, in particular, micro and small companies account for 99% of the total number of companies.
The aim of this paper, then, after some preliminary considerations on the actuation in Italian law of regulations on safety in the workplace, is to evaluate how small and medium companies are affected by environmental regulations, above all Community ones, and to assess the degree of awareness of these companies with regard to the impact of the regulations in force.
Some important deductions can be drawn from the interviews made at the Association of Higher Training Forum of Ravenna and Montecatini Environmental Research Centre, Ravenna. Amongst other things, these will enable a realistic assessment to be made of the effectiveness of the new environmental policy instruments that have entered into the law of the European Union. In this connection, I should like to thank the representatives – owners, managers and staff – of the twenty-two companies that kindly agreed to take part in this work.

6.1.1.2 The actuation of regulations on safety in the workplace

In Italy, Legislative Decree (D.Lgs) 626 of 1994 adopted Community Directive 89/391 and its general principles regarding health and safety in the workplace. It brought an important change in Italian law, highlighting the existence of rights and duties on the part of both employers and workers and stressing that the level of safety at work can only be raised by involving both of them. This means that the employer is no longer considered the only active party in this field – instead, he must collaborate with his workers to ensure that working conditions are optimal for their health and safety.
To achieve this, D.Lgs. 626/94 not only obliges employers, in all companies, irrespective of their sector, to adopt a series of measures to safeguard the health and safety of their employees at the workplace but also obliges the workers to respect the instructions they are given and collaborate with the employer.
The Prevention and Protection Service (PPS) is another innovation introduced by D.Lgs 626/94, Art. 2, letter c) of which defines this as *„the whole of the persons, systems and means*

[24] *by Gianfranco Tamburelli*

external to or inside the company, i.e. the production unit". The primary aim of this service, however, is to encourage the creation of conditions in the workplace that will guarantee the highest degree of quality in terms of the life of workers, protecting their health, improving their physical, mental and social well being and preventing illness and accidents. It will act as a special consultant for the employer on all matters – risk assessment, choice of preventative measures, establishment of procedures, information – involved in safeguarding the health and safety of the workers.
To achieve this aim, multi-disciplinary skills are required, integrated into a special organisation. Two professional skills in particular are necessary: industrial health and safety, with the ability in communication techniques and work organisation.
For prevention on the widest scale, one further professional skill is required: that of the doctor, whom the D.Lgs does not see as a member of the PPS, even though he or she will obviously be required to co-operate very closely with it, as the decree itself provides.

The great majority of Italian firms25 have already brought themselves into line with this legislation, while the remainder are well on their way towards doing so.26
It should also be noted that the Ministry of Labour D.Lgs of 16 January 1997 on training for health and safety in the workplace prescribed the training packet that companies must provide for their workers and the personnel responsible for workers' health and safety.

6.1.1.3 Respect for environmental protection standards

Companies are now well aware of how generally sensitive public opinion is about environmental protection, and although news stories and judicial enquiries show a different picture, no businessman has the courage to admit that he is indifferent or contrary to these issues or, simply, that he is having difficulty meeting the standards of environmental protection required by law.[27]
It should also be noted that some of the companies that say they respect these standards put those established at community level in first place.[28]

a)Awareness of ISO standards

Nearly all of the companies knew of the international standards.[29] Some have already been certified (ISO 9000, ISO 9002, ISO 14001) or are awaiting certification (ISO 9000 and ISO 9002).[30]

25 Figure 1 shows that 90.9% of the firms interviewed said they had complied with the new regulations, sometimes stating that they had done so only recently.
26 Only two of the firms interviewed (9.1% of the total) were still in the process of complying with the regulations, and expect to have completed this by the end of the year. Interestingly, both are medium-size companies operating in Calabria, in the south of Italy, in the food and agricultural sector.
27 As Fig. 2 shows, 73% of the companies interviewed said they respect the standards of environmental protection; the remaining 27% preferred not to reply.
28 Three of the twenty-two companies interviewed referred explicitly to Community regulations; two of these operate in the food and agriculture sector. The reference for these two companies was to EEC Regulation no. 2200 of 1996, „*Operative Plans*"; the other was to EEC Regulation no. 2078, „*Integrated Fight*".
29 Only three of the twenty-two companies interviewed said they were not aware of the ISO standards (Fig. 3). Of these, two were exporters in the food and agriculture sector.
30 These amount to 37% of the companies who knew the ISO standards (see Fig. 3).

b) *Organisation for technological innovation*

The growing demand for quality has persuaded many companies to organise themselves so as to be more competitive in seeking technological innovation and environmentally compatible products.[31]
However, new, well-aimed interventions seem to be necessary in order to make more and more companies aware of the need to invest in this direction.[32]

c)Awareness of economic and fiscal mechanisms

Preparing measures for encouraging technological innovation and environment-friendly products – supplementing and, where possible, going beyond command and control measures – is a slow process.
It is not surprising, therefore, that a substantial proportion of the small and medium companies operating on the Italian market[33] say they are unaware of the economic and fiscal facilities available for reconverting plant in order to provide incentive for new production processes, technological innovation and environmentally compatible products.
However, measures for encouraging biological farming do seem to be fairly well known.[34]

6.1.1.4 Application of market mechanisms for sustainable development as regulated by Community law

In Italy, long negotiations between the state and private sectors have led to a choice not found elsewhere in Europe: to concentrate the functions of the competent body for Ecolabel and Ecoaudit in one body. By Decree of the Minister of the Environment of 2 August 1995, in fact, a single entity was created that combines the actuating functions of the system of ecological labelling introduced by EEC Regulation 880/92 and the system of eco-management and environmental auditing created by EEC Regulation 1836/93.
The Committee consists of a President and Vice-President – appointed by the Minister of Environment jointly with the Minister of Industry – and twelve other members, four of whom are appointed by the Minister of Environment, two by the Minister of Health, four by the Minister of Industry and two by the Minister of Treasury. All the members of the Committee (who must be persons of specific and proven skill and experience – art. 2 of the Decree) remain in office for three years, and may not perform any other professional activity, including consultancy, during that period.
The Committee is divided into two autonomous sections, one for Ecolabel and one for Ecoaudit, but carries out its duties as a single body when the two voluntary certification systems are involved. It can also call on the support of ANPA, the national agency for environment, which, in addition to carrying out the technical and administrative examination of applications, also draws up the proposals for new groups of products to be submitted for selection *ad hoc*.

31 54% of the companies interviewed said they had already done this (Fig. 4).
32 The figure for the companies that did not make their position clear (25%) seems to be linked to a desire to give themselves as modern an image as possible, and so should probably be added to the figure for those companies that admitted they were not equipped to make the quality of their supply adapt rapidly to the evolution in demand (another 23%) (Fig. 4). In these two groups there were as many as four companies operating in the food and agricultural sector, all of them exporting to the international market.
33 46% of those interviewed said that did not know of these facilities, while a further 18% gave no answer (Fig. 5).
34 Three of the four companies that said they knew of economic and fiscal incentives for environmental protection operate in the food and agricultural sector (Fig. 5).

a)Ecolabel

Applications for award of the Community environmental quality mark are sent to the Ecolabel section of the Committee through ANPA, which has to carry out its inquiries within 60 days from the date the application was made. The Committee then has 30 days to decide whether or not to accept the application.
A considerable number of companies[35] were interested in the Ecolabel mark. Most of these (78%), including some in the food and agricultural sector, operate on the international market. Nevertheless, the Community mark of environmental quality still seems to be little known and not appreciated enough.[36]

b)Ecoaudit

The Ecoaudit section of the Committee has the task of accrediting and controlling environmental auditors. It also keeps the professional roles for these. The procedure, however, is still little known.[37]
Companies which are already certified or intend to apply, or even simply know of the procedure,[38] tend to look to the international market (64%). Some of these belong to the food and agricultural sector.

6.1.1.5 Community regulations and new professions

The companies appeared not be fully aware of the importance of legislative policy for the birth of two new professional figures - quality and safety officers. Many denied the influence of legislation, claiming that the decisive factors are the market or appearance of „internal organisational requirements". Others refrained from giving any opinion.[39]
From the replies of the companies, then, it is difficult to evaluate the extent to which the birth of these two professions was the result of the need to conform to national or Community regulations, and to assess the relative weighting for the two legislative levels.
Amongst the companies that admitted they had been influenced by legislation, the majority said they had referred to national legislation.[40] These tend to be medium to large companies operating in different sectors, of which the most important market is the domestic one.
With regard to the reasons why these new professions are making headway – few saw the need for one expert to manage quality, environment and safety – the general tendency seems to be to consider the market the determining factor;[41] only a third of the companies[42] interviewed gave any importance to the relevant legislation (referring to the legislation in general or labour law in particular).
Moreover, these were mainly exporting companies, differing considerably in size – from small firms to companies employing more than 600 persons – and market sector, which ranged from industrial goods to baked goods, liquid detergents, food, additives for plastics,

35 41% of the companies interviewed (Fig. 6).
36 59% of the companies interviewed said they did not know the Community law or were not interested (Fig. 6).
37 50% of the experts interviewed said they did not know of Ecoaudit (Fig. 7).
38 The companies already certified or that intend to apply made up 18% of the sample, while those that knew of the procedure amounted to 32% (Fig. 7).
39 Respectively, 49% and 36% of the companies interviewed (Fig. 8).
40 Only one of the companies interviewed attributed any importance to Community and international regulations (Fig. 8).
41 This was the view of the majority of the companies (Fig. 9).
42 More precisely, 32% (Fig. 9).

paints and resins, management of thermoelectric power plants, construction of offshore platforms and the public service sector.

6.1.1.6 Final considerations

The public administration was certainly very slow in setting up the Committee for Ecolabel and Ecoaudit after the adoption of the Community regulations, and this serious delay made it impossible for Italian companies to register the sites subject to environmental audit and apply for the community mark of ecological products for their products. The companies, however, must now share the responsibility for the failure of these instruments to take off.
If Ecolabel and Ecoaudit, as is likely, are going to provide an opportunity in the near future for marketing that will give companies a competitive edge, it would be as well to examine the opportunity[43] and decide what steps to take.
Another indication that emerged from the inquiry should also be taken into account: a substantial number of companies declared themselves favourable to the adoption of national regulations. This seems significant, but it must be remembered that quite a few companies knew absolutely nothing about Community regulations on the environmental quality of products.
Of the firms that were against the introduction of national regulations,[44] there are some operating in the food and agricultural sector that complain about lack of professional training services.

To conclude, the following needs seem to have been pinpointed:

- market instruments for sustainable development must be brought to the attention of a much larger number of firms;
- the relationship between the international certification standards and Community Ecoaudit regulations needs to be clarified, as must the potential advantages to be gained from undergoing the Ecoaudit procedure;
- the procedure for awarding products the Community mark of environmental quality needs to be simplified;
- postgraduate professional training courses should be introduced to provide adequate skills for the new professions, especially that of environmental quality specialist;
- entrepreneurial awareness and knowledge must be improved so that businessmen will be able to anticipate requirements;
- a suitable professional training procedure must be introduced to ensure that the new professions can participate in an integrated approach to quality, environment and safety, with special attention to the reality of small and medium companies operating in the food and agricultural sector, and also bearing in mind the particular situation of those located in regions with a low level of industrial development.

43 Of the experts interviewed, 72% were in favour (Fig. 10).
44 A group of firms of differing sizes, all but one of which are exporters.

Figura 1

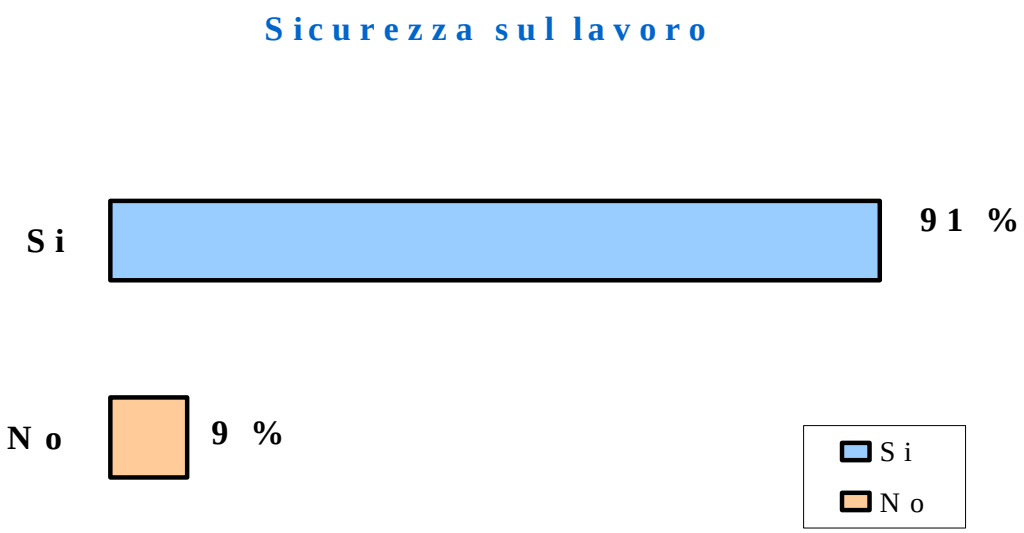


Figura 2

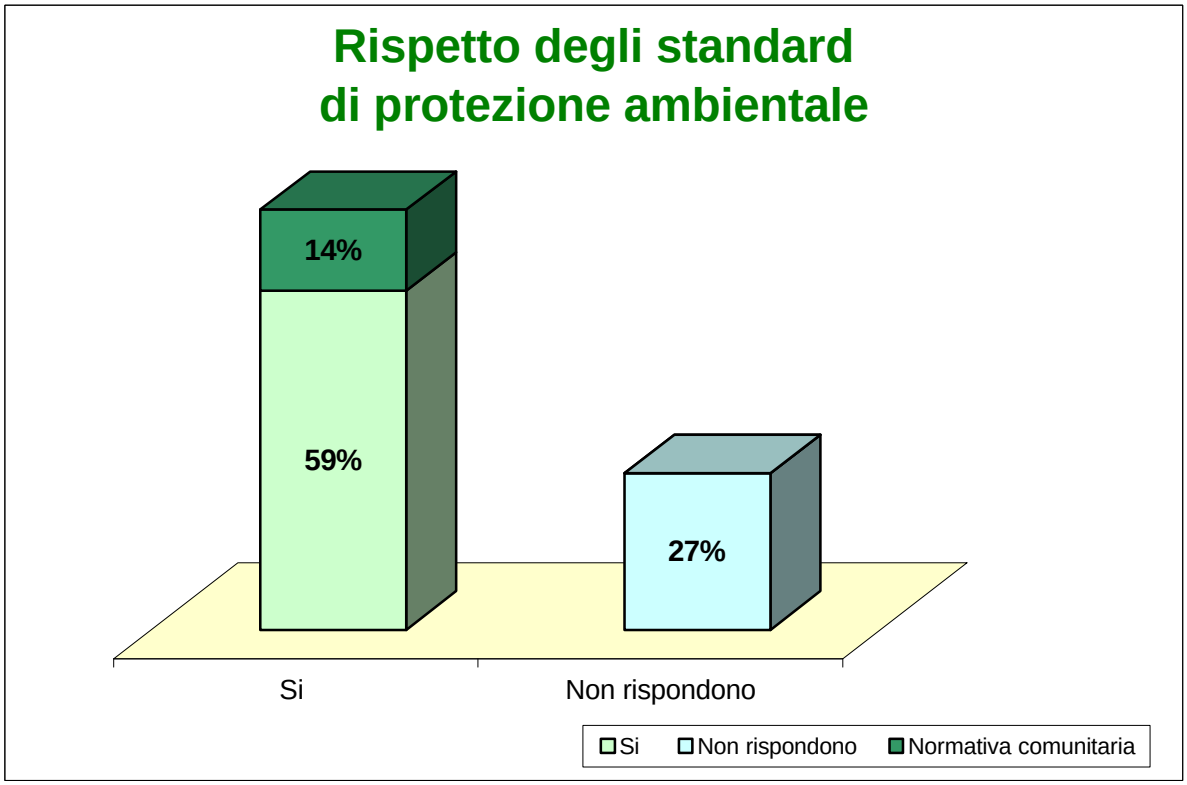


Figura 3

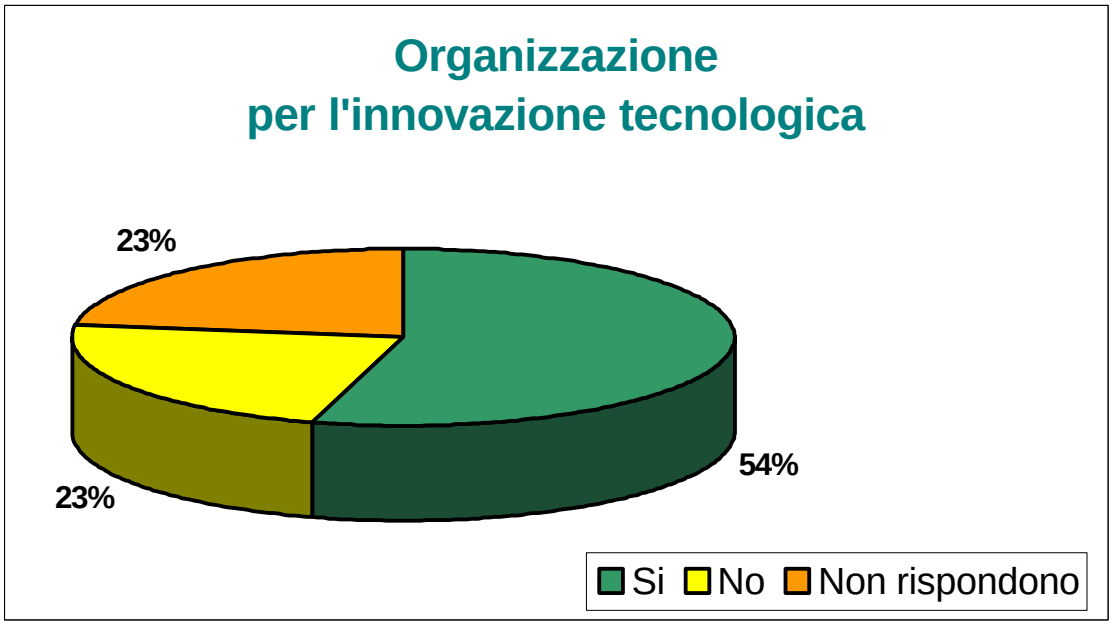
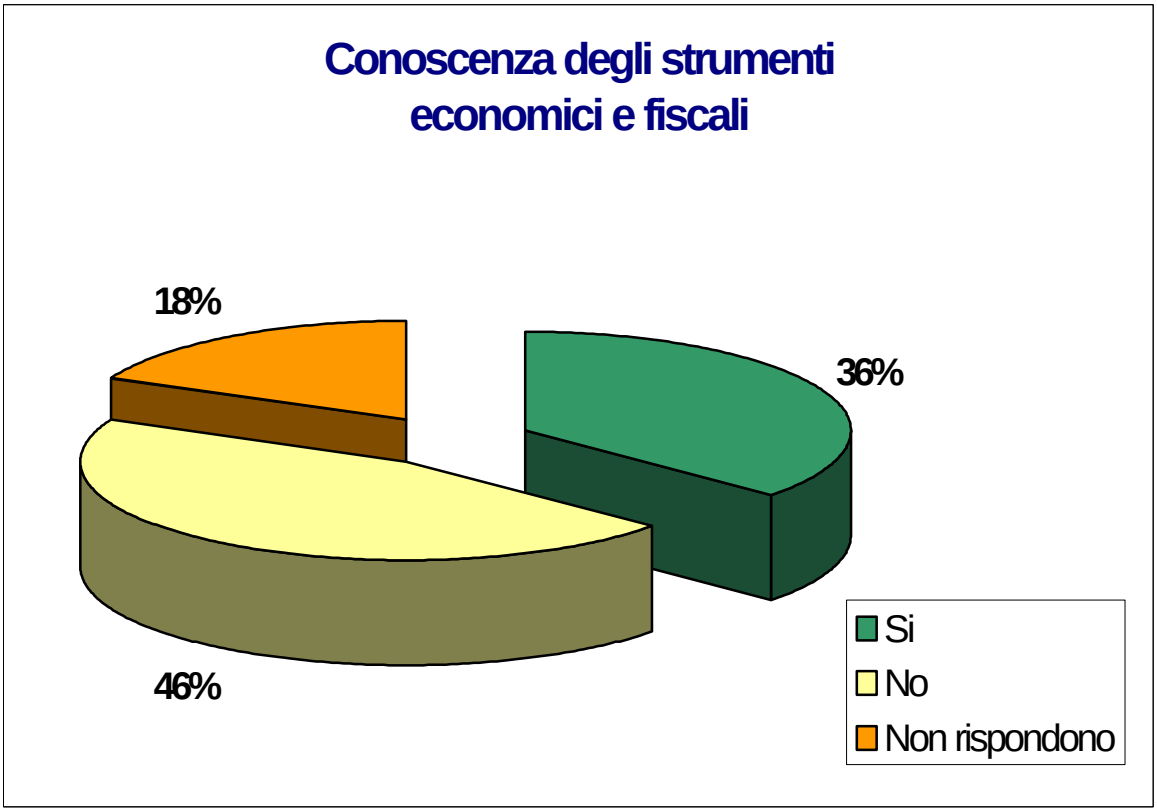


Figura 4



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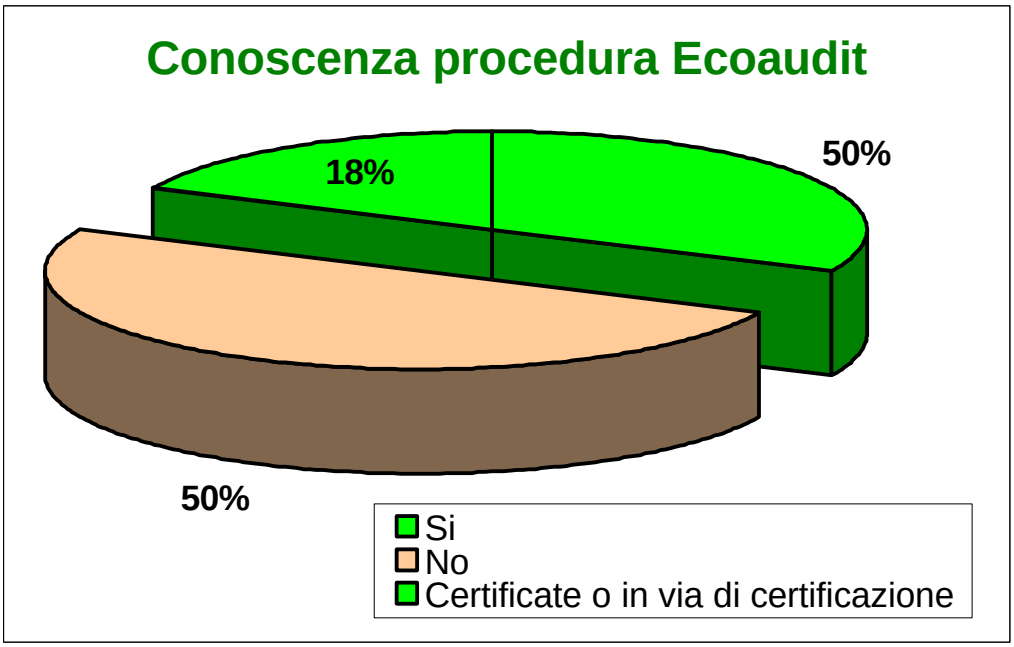
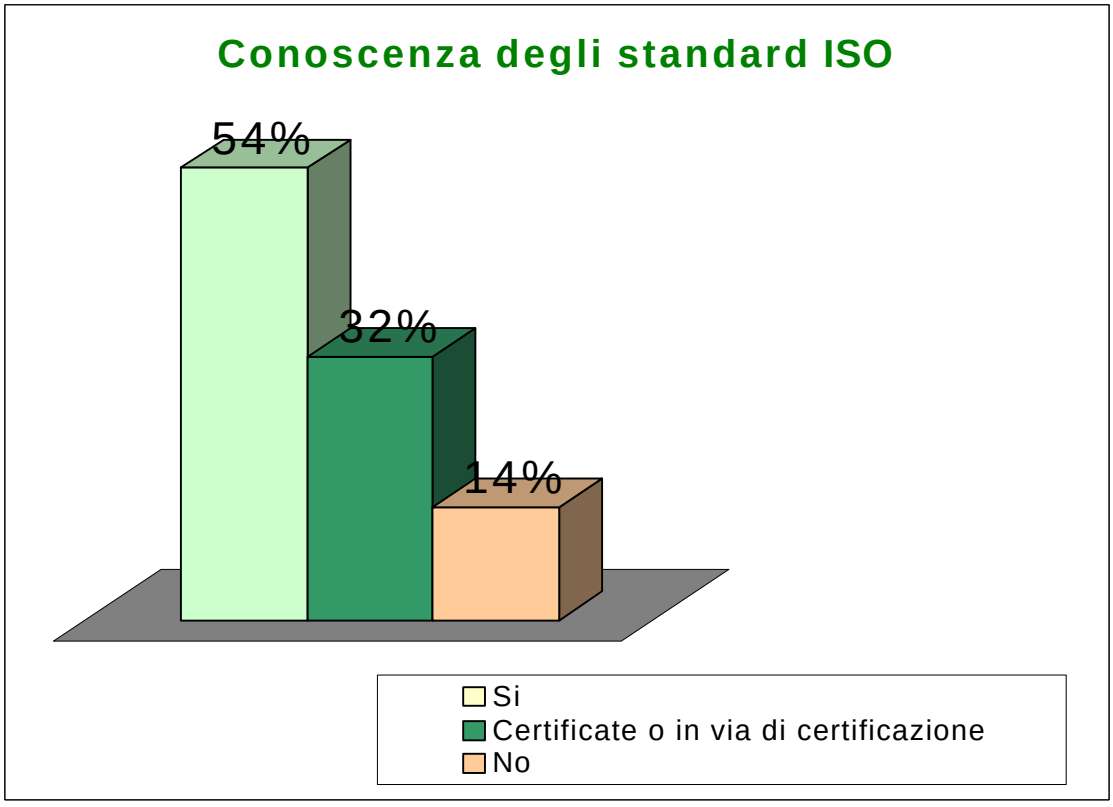


Figura 6



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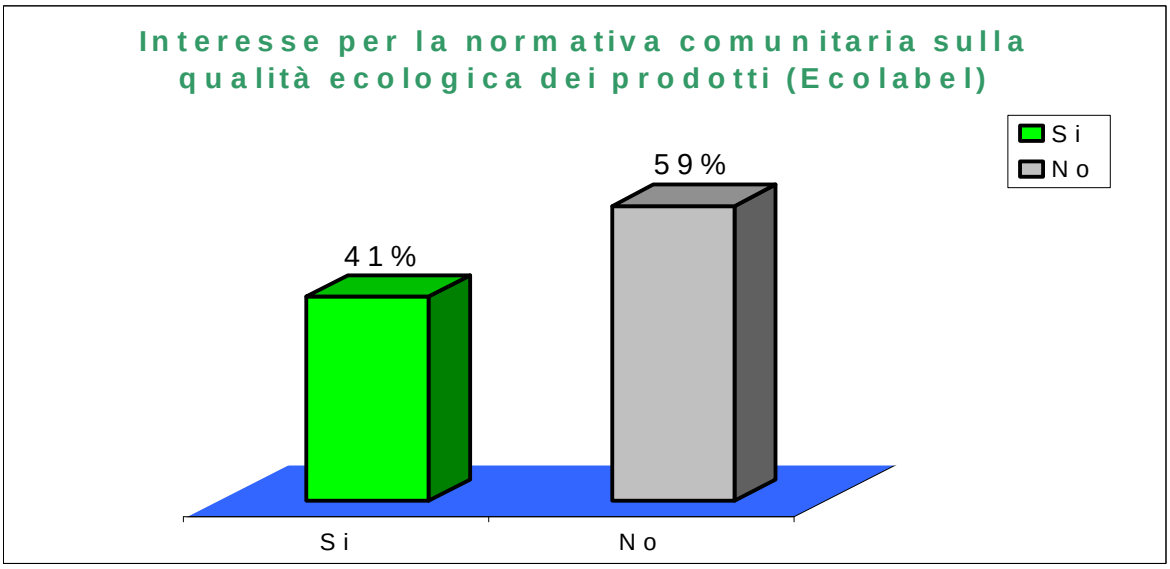


Figura 8

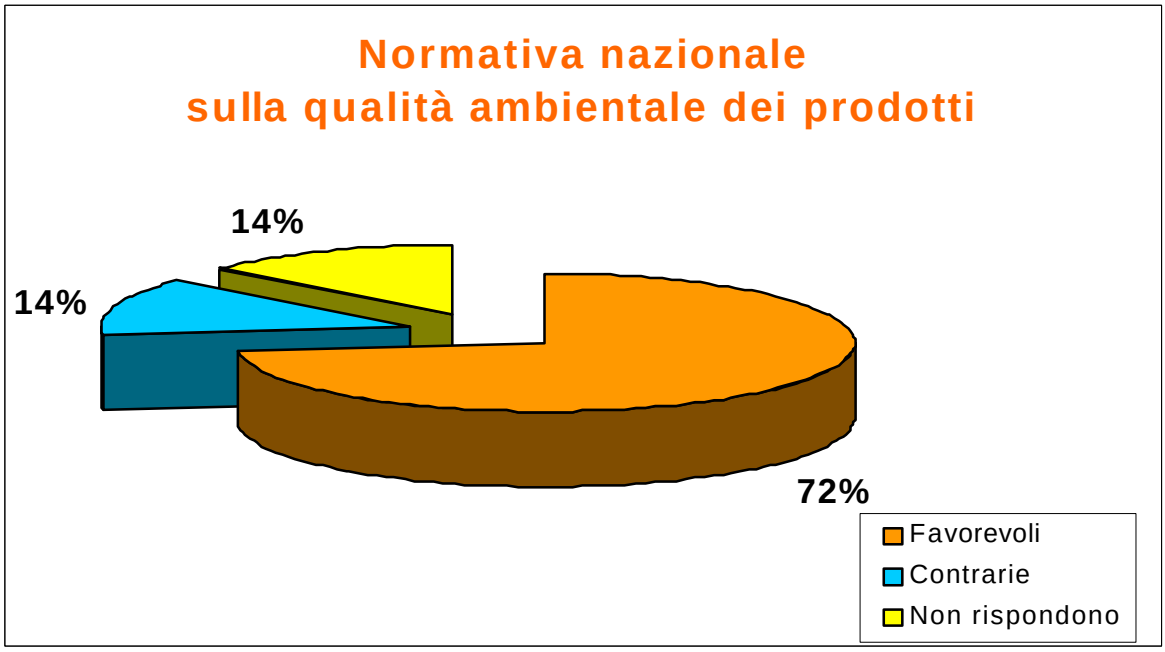
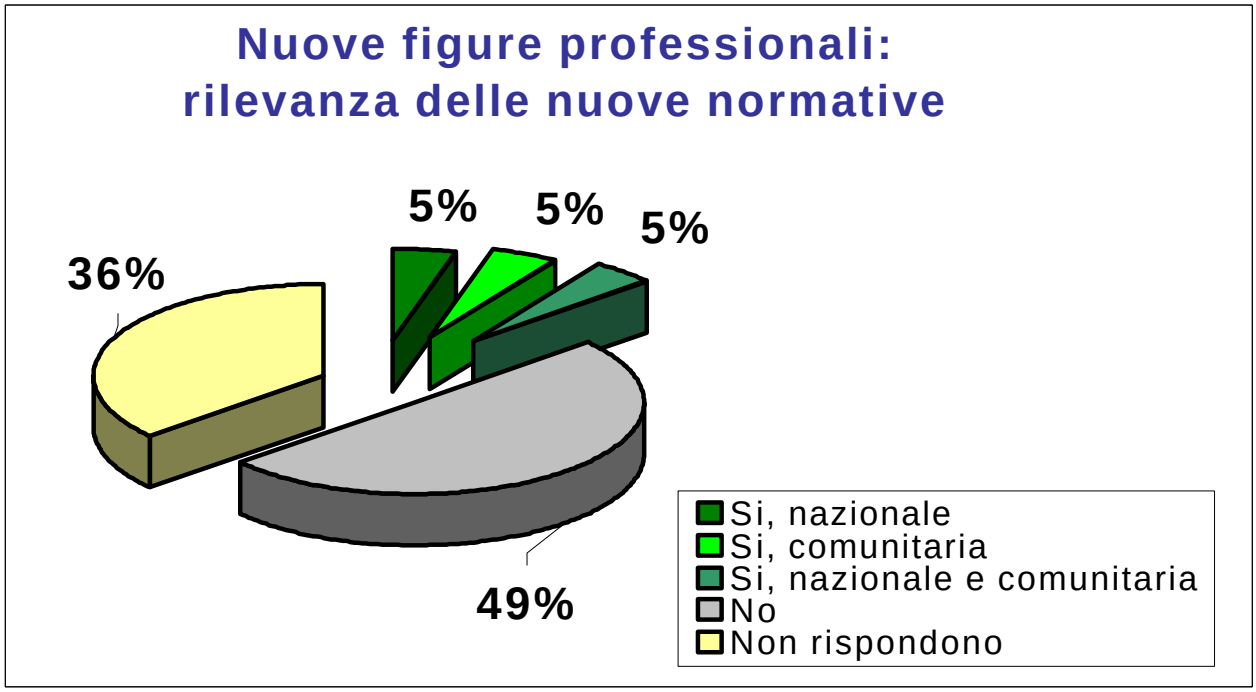


Figura 9


Nuove figure professionali:
rilevanza delle nuove normative
5%
5%
5%
36%
49%
Si, nazionale
Si, comunitaria
Si, nazionale e comunitaria
No
Non rispondono

6.1.2 Professional profiles and necessary skills for the management of quality, safety and environment in SMEs[45]

6.1.2.1 Introduction

The progress achieved by technological research and the growing interest expressed by public opinion have led the EU and national governments to prepare several laws, aiming to grant an eco-maintainable development.
These innovations request an evaluation of the necessary new professional skills and consequently, the realisation of appropriate training courses which encourage co-operation among universities, enterprises and research centres.
„Sequi„ would like to elaborate an optimal model of training courses which might be addressed both to young graduates or employees of enterprises involved in this field to perform their professional skills.
Firstly, the aim of this research is to highlight the relations among the following aspects:

- Market globalisation,
- Evolution of law systems,
- Dimension of an enterprise, and on the other side:
- The new needs of professional training, which enterprises are not always aware about due to a certain difficulty in measuring the benefits for an enterprise to update or install new systems for the management of environment and safety.
- The creation of a new system of management and organisation of work in the enterprise, innovations that have to consider the new exigencies emerging from this new complexity.

Secondly, the project aims to compare the needs of professional training expressed by the enterprises with training offers already existing in this field.
Therefore, it seems to be interesting to gauge the level of satisfaction of the enterprises interviewed, in relation to training offers available in Italy nowadays, in the environmental, safety and quality field.

Italian Context

The integrated management of environment in a company requires high costs. If on one hand big enterprises are more prepared and available, small and medium enterprises might react differently (taking on a behaviour called „free rider„).
The SME (Small and Medium Enterprises), particularly developed in Italy, are a serious problem for the environment underlining. Most of them require governmental aid to implement new protection systems and train their employees.
Furthermore, in Italy, on the one hand enterprises are the main subject of mediation between the exigencies of economical development and protection of the environment. On the other hand, they still have difficulties in adopting solutions for environmental topics, solutions that request time to be develop, innovation in the field of the organisation, production, technology and vocational training.

[45] by Sabrina Bandini, Cra Montecatini Spa

6.1.2.2 Sample of enterprises interviewed

This sample of enterprises would like to:

- gather a range of economical activities, with the aim of establishing the common points and important differences about the needs of professional training offers identified in the enterprises in different sectors (industry, services, commerce)
- gather a range of enterprises of different dimensions to compare the different reactions to the work organisation in a SME (Small and Medium Enterprise) or large enterprise;
- reach an important number of enterprises that are located in several Italian Regions (North, Centre, South) to also measure the level of homogeneity in the institutional behaviours of different Regions (political system of aids for professional training, technology or research);

Among the enterprises interviewed, some of them (particularly in the Emilia-Romagna Region) have received aid to install the EMAS system, thanks to a project financed by ERVET (Ente Regionale di Valorizzazione Economica del Territorio della Regione).

The 22 enterprises interviewed belong to the following fields:

a. agro-industry, 9; of which 4 are in south Italy and 5 in Centre-North; 7 are SME,
b. chemical industry, 3; of which 1 is in south Italy and 2 in Centre-North; 1 is SME,
c. energy industry, 1, in North Italy,
d. manufacture, 3; of which 2 are in South Italy and 1 in Centre-North; 2 are SME,
e. services, 4; all are in Centre/North; 2 are SME,
f. building and engineering enterprises, 2, of which one is a SME in Centre South and the other a medium enterprise in North.

Sector of activity	**Number**	**South**	**Centre/ North**	**Of which are SME**
Agro-industry	9	4	5	7
Chemical Industry	3	1	2	1
Industry and Energy	1		1	
Manufacture	3	2	1	2
Services	4		4	2
Building and Engineering Enterprises	2	1	1	1
Total	**22**	**8**	**14**	**13**

Sector of activity	**%**	**South**	**Centre/ North**	**Of which are SME**
Agro-industry	40%	44%	55%	78%
Chemical Industry	14%	33%	67%	33%
Industry and Energy	5%		100%	
Manufacture	14%	67%	33%	66%
Services	18%		100%	50%
Building and Engineering Enterprises	9%	50%	50%	50%
Total	**100%**			

6.1.2.3 The system of data collection

Data have been collected toward a questionnaire prepared by all the partners of „Sequi„ and submitted to all the above-mentioned partners.
The questionnaire is divided into three parts:

- The first part covers general information about the dimension and activity of the enterprise,
- The second part covers the definition of „safety, personnel, environment, quality management„,
- The third part determines the main characteristic of the new professional profiles.

This rapport aims to work out the questions in the third part of the questionnaire which are the following:

- How many new profiles are necessary in your opinion?
- Could you describe the main skills of these new profiles?
- Which of the following should be the „background„ of these professional profiles?
  1. *Economic,*
  2. *Technological,*
  3. *Organisation,*
  4. *Juridical,*
  5. *Scientific,*
  6. *Managerial*
- Which are the institutional paths for the training of this profession?
- Could you point out the factors which have contributed to the evolution of the demand for these new profiles?
- Was the creation of new profiles brought about by the new Laws of State and the European Community? (Elaborated by Dr. Tamburelli)
- In which area of the enterprise is it convenient to apply this new professional profile?
- In the above-mentioned fields, what are the main problems in the internal organisation of the company that should be solved by this new professional profile?
- What is your opinion about the quality of vocational training offers for graduate students in relation to existing needs?

6.1.2.4 Table of data codification

To elaborate on the answers to the open questions submitted by the enterprises, the construction of a table of data codification was necessary.
The first effort was to create a schedule to classify the information in homogeneous categories, considering our two main purposes:

- To define the needs of enterprises,
- To determine the critical points in present training offers.

The schedule is as following:

- How many new profiles are necessary in your opinion?

One profile	20%
Several profiles	80%
Didn‘t answer	2

- Could you describe the main skills of these new profiles?

Managerial	47%
Technological	53%
Didn‘t answer	5

- Which of the following should be the „background„ of this professional profile?

Economic	5%
Technological	35%
Organising	13%
Juridical	11%
Scientific	26%
Managerial	10%
Didn‘t answer	2

- Could you point out the factors which have contributed to the evolution of the demand for these new profiles?

Globalisation of the markets	76%
Development of the law system	19%
Technological innovation	5%
Didn‘t answer	2

- Was the creation of new profiles brought about by the new Laws of State and the European Community? (Elaborated by Dr. Tamburelli)

Yes	30%
No	70%
Didn‘t answer	3

- In which area of the enterprise is it convenient to apply this new professional profile?

Staff	81%
Project manager	13%
Other	6%
Didn‘t answer	5

- In the above-mentioned fields, what are the main problems in the internal organisation of the company that should be solved by this new professional profile?

Efficiency of controls/ organisation of the process/improvement in internal relations/personnel motivation/augmentation of the knowledge of quality systems/to become the only point of information for the management/to improve the management/ to improve the professional training in the company/to find a common purpose/to coordinate the equipe of work/to improve internal communication	75%
In all sectors of the enterprise	5%
To improve the marketing/ company image and the relationship with customers and suppliers/ the relationship with institutions	15%
Technical problems of interpretation of juridical laws	5%
Didn‘t answer	5 enterprises

- What is your opinion about the quality of vocational training offers for graduate students in relation to existing needs?

Complete	8%
Incomplete	46%
Inadequate	31%
Non-existent	15%
Didn‘t answer	9

6.1.2.5 Results and reliability of data

One of our main intentions was to measure the level of reliability of the data gathered. A simple and direct indicator linked to the number of questions not answered (related to the whole questionnaire) and level of quality of the answers to open questions (analytical esprit of our operators) showed an important involvement of the interviewees. Most of them used the questionnaire to declare their own vocational training needs, difficulties encountered during the development of their work or potential troubles.
We have frequently discovered not just an interested but also a constructive approach.
All this is explained thanks to the great hope of what the institutional system of vocational training might offer.
We must also take into consideration that the competitiveness of an enterprise lies in the capacity to select and engage professional profiles already trained and fit new professional needs.

- How many new profiles are necessary in your opinion?

Most of the interviewees consider it indispensable to have a large number of professional profiles for the integrated management of safety, quality and environment.

- Could you describe the main skills of these new profiles?

For most of the interviewees, these new professional profiles must have the most important skill of merging technical competence with the ability to manage equipe of work and being able to work with equipe.

- What should be the „background„ of this professional profile?

Most interviewees preferred the technical and scientific background.

- Which are the institutional paths for the training of this profession?

The interviewees point out that the service of integrated management in a company requires high school personnel, specialised personnel (high school + two year of specialisation) or personnel with degree (high school + 4 years). This answer illustrates the complexity of management in this service and the various tasks that are covered.
Professional training is considered indispensable to update these school profiles and adapt them to the needs of the enterprises.
All interviewees stress the importance of introducing some practical training in the enterprises.

- Could you point out the developments which have contributed to the evolution of the demand for these new profiles?

Most of the enterprises are aware that market globalisation obliges them to adopt an industrial marketing policy which modifies their internal organisation to apply „total quality style„. This creates the need to have professional profiles who are confident in this new language. Only enterprises with local or protected markets, not international, find that these new professional profiles were created by law developments.

- In which area of the enterprise is it convenient to apply this new professional profile?

Most enterprises (81%) consider that this is a staff profile which loses its traditional characteristic of environmental operator rather than assume that of manager.

- In the above-mentioned fields, what are the main problems in the internal organisation of the company that should be solved by this new professional profile?

A large number of enterprises interviewed consider that this profile should mainly take care of the internal management of the enterprise and secondly improve the external relations of the enterprise.

- What is your opinion about the quality of vocational training offers for graduate students in relation to existing needs?

46% of the companies interviewed answered that post-degree vocational training offers are usually incomplete. All interviewees stress the serious lack of practical experience in a company.
15% of the companies interviewed answered that professional training offers are non-existent (SME in South of Italy).

6.1.2.6 Abstract

The enterprises we interviewed and the fours witnesses we gathered, who are operators in this field (professional trainers), confirm that most of all the phenomenon of market globalisation is an important impulse for enterprises to update their organisation chart because the increasing role of this competitiveness stimulates the industrial marketing policy to change the internal organisation and impose „Total Quality Style„.
In spite of this assertion, we have to stress that the organisation of work in big enterprises is certainly different from that in SME.
In SME's the difficulties in introducing the concept of environmental management and integrating the policy and information of the environment contribute to the slowing down of the application of new management concepts.
It is a deficit which translates into the difficulty in finding staff or responsible persons in the SME to manage or introduce quality, safety and environment management which is normally considered only by large enterprises. In SME's we normally find responsible persons of several safety services or quality only, whose work is not really integrated.
Besides, it is not useful to deny the fact that the European environmental law, and especially that of EMAS, gives an important role to enterprises for its realisation, is interpreted taking consideration of the relation between costs and profits, a relation that contributes to maintaining a huge distinction between SME and large enterprises in the settlement of the system of integrated management.
The needs of vocational training as expressed by enterprises are in detail:
First of all, introducing the integrated service of safety, quality and environment in an enterprise means not just limiting their own task to an executive one, but to assume a wider

perspective of the capacity to observe and focus this function to create and project new objectives, new opportunities and risks.
Integrated management requires one to assume some responsibilities that have different and stratified aspects, and the professional profile in question cannot just be the simple addition of different specialised competencies.
This professional profile loss does not adopt the traditional characteristic of an environmental operator but rather that of manager, a „generalist„ who not only has strategic competencies and skills in the management of an enterprise but also public and internal relations.
Secondly, it seems necessary to think that the service of integrated management in a company, above all large companies, consists of not only just one kind of professional profile but also a true group of technicians working as an equip.
The complexity of the management, underlined by the large enterprises, normally creates a complex staff involved in environmental questions.
This structure usually consists of a person responsible for the environmental audit, a manager and also the „health and safety manager„, „energy manager„ and other persons responsible for specific tasks in the company:

- waste management,
- packaging management,
- transport management, etc.

All these responsible persons, called environmental managers, meet in a work group which, when needed, is combined with responsible persons from different unity productions. The group defines the environmental policy of the enterprise.
At the end, the fluidity of the situation that we have just defined suggest that we speed up the dialogue between theory and practice in the projects of professional training, above all in this field.
The witnesses of the company who are interviewed by now seem to stress the importance of orientating the system of „professional training„ in the direction of the dialectic of „complex system„; a concept that is indispensable to assimilate to give young people flexible instruments for:

- applying in the environmental management staff of a company,
- working as a consultant of a large, small and medium enterprise,
- and creating an enterprise of services in this field.

This last point leads us to ask if the creation of new enterprises could be a new kind of employment for young people.

6.2 Report from Austria[46]

Sampling and Methodology

The questionnaire developed within the framework of the project should serve as a basis for the development of these curricula and describe the requirements (with regard to field of operation, training and job description) for these fields of responsibility and occupation profile.
In this chapter, the main results of an oral survey assisted by fourteen semi-structured questionnaires are presented. The main connecting threads were drawn up by SEQUI's Italian project partners and translated for use in Austria by FACTUM. These threads largely pursue the inquiry into the internal company practice of SEQUI aspects. Additional questions from the Austrian project team were included in the interviews. These concerned on the one hand the core competencies required by SEQUI managers and on the other hand the need for new concepts in the organisation of training and further training.
The important questionnaires aimed therefore for an analysis of:

- the current and future organisation of SEQUI aspects
- an integrated management system which incorporates all three aspects
- the main competence element of a future SEQUI management system
- the qualification and educational processes necessary to become a SEQUI manager

Sample structure

FACTUM and the CENTRE FOR SOCIAL INNOVATION (CSI) carried out a total of fourteen interviews. While the results cannot be seen as representative (due to the small number of interviews) they still, as a result of the selection of companies and interview partners, provide a useful indication of the response to the questionnaires.
Companies from different economic fields and certified as well as non-certified businesses were questioned in order to reach a broad spectrum of answers. The people questioned are themselves employed in one of the management systems of safety, quality and environment or are the superiors of employees responsible for SEQUI. This allowed the occupational practice aspects and its requirements to be included and taken into account in the curriculum development.

Characteristics of the employers

The following is a brief description of the characteristics of the employers questioned (see Table 1):

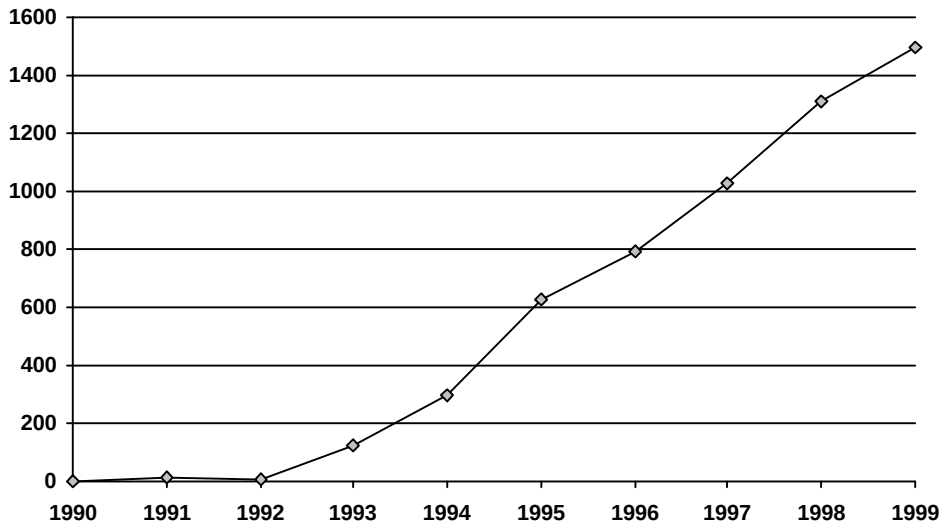
- The chosen organisations operate in the fields of production, distribution and service industries; whereby the manufacturing field dominates
- Half of the companies operate internationally, the other half nationally or locally.
- Some of the companies were founded 100 years ago, the majority, however, quite recently (3 companies were founded after 1980 and 5 between 1960 and 1980).

[46] by Karin Ausserer; FACTUM & Maria Schwarz-Wölzl, CSI

- One third of the companies are SMEs with up to 250 employees, a further one third employs up to 700 employees and the rest are, with between 1,200 and 45,000 employees, extremely large companies.
- With regard to certification in one or more SEQUI fields, five companies have no certification in any of the three SEQUI fields. One company is, in addition to the ISO certification for quality and environmental management fields, also certified in the field of safety47. One third of the companies had certification in quality as well as environmental management. Nonetheless, in three of the companies, the certification applied only to specific departments and not to the company as a whole.

Since there is no central record of certification in companies in Austria, whether or not this distribution can be seen as typical of the general situation in Austria, is difficult to verify. Central registration is made more difficult by the fact that not only Austrian, but also foreign certification bodies (e.g. LOLDS, TÜV Süddeutschland) certify Austrian companies. The ÖQS, Austria's biggest certifying body, has certified 1,400 Austrian companies according to ISO 9000f in the last eight years (see Illustration 1).

Illustration 1: Number of ISO 900x certificated companies: 1990-1999
data in absolute figures

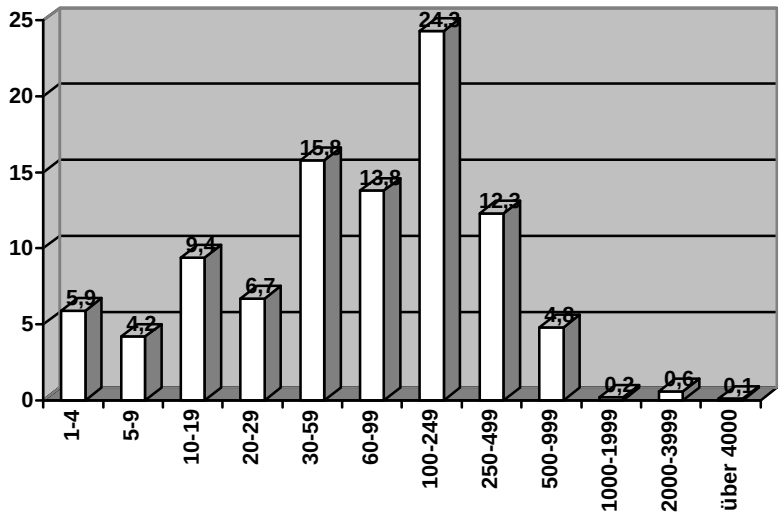


Source: ÖQS, http://www.oeqs.at/DIEOEQS.HTM

From the statistics of the ÖQS Zertifizierungs- und Begutachtungs Ges.m.b.H, a trend towards certification can be identified. This is, above all, recognisable in medium-sized companies (see Illustration 2):[48]
xxx

Illustration 2: Size of certificated companies (employees) in percent

47 This is rather an exception for Austria according to the estimation of our interview partner; the safety certification most widely achieved in Austria „Sicherheits Certificat Contaktorenkonzept"(Safety Certificate) is, according to information from the representative of the SCC; Hr. Pawlowitsch, is only found in an estimated 10 companies in Austria
48 http:www.oeqs.at/DIEOEGS.HTM



SourceÖQS: http://www.oeqs.at/DIEOEQS.HTM

Table 1: Description of the organisations investigated

FB-NR.	ECONONMIC SECTOR MAIN FIELD OF OPERATION	COMPANY'S AREA OF OPERATION	ORGANI-SATIONS-STRUCTURE	YEAR FOUNDED	TURNOVER 1997 in ATS	NUMBER OF EMPLOYEES	CERTIFICATION in S /E/QU[49]
1	Production: Manufacturing	International	Business Unit	1948	2,1 bill.	580	S[50]/E/ QU/
3	Production: Manufacturing	International	Subsidiary firm	1980	w. A.	155	E/QU
7	Production: Manufacturing	International	Business Unit	1995	900 mill.	600	E/QU
10	Production: Manufacturing	International	Business Unit	w.A.	85 bill.	50 000	QU
13	Production: Manufacturing	International	Independent	?	w.A.	30	QU
14	Production: Agriculture Operation	National	Independent	1970	3 mill.	2	None
5	Trading	Regional	Subsidiary firm	1977	1,2 bill.	420	None
8	Trading	National	Subsidiary firm	1961	900 mill.	200	E/QU
9	Trading	Regional	Independent	1899	60 mill.	30	None
12	Service: Culture, Sport and Entertainment	Regional	Independent	1983	8 mill.	60	QU
11	Service: Credit- and Insurance	International	Independent	w.A.	w.A.	14 000	QU
2	Service: Health- and Social Services	Regional	Subsidiary firm	1889	o. A.	700	None
6	Service: Health and Social Services	Regional	Independent	1960	1,98 bill.	2500	None
4	Service: Research and Development	National	Subsidiary firm	w. A.	3,7 bill.	1200	E/QU

49 The following abbreviations are used here: QU for quality management S for safety management; E for environmental management

50 According to „responsible care„ by LOLDS (according to the interviewees the biggest certification institute), development of hand book beginning from the element orientation upto the process orientation common for ISO 9000f and 14 000

Opinions of the interviewees

To do justice to the many different points of view, the people chosen as the target group of the survey were people in charge of safety specialists, environmental or quality managers as well as responsible for SEQUI systems themselves. Of the 14 interviewees

- seven are established in upper management; they are executives in charge of employees in one or more SEQUI fields without performing an operational function themselves; e.g. „technical director„, „assistant to the board„, „administrative director„ etc.
- four of the interviewees are employed as heads of internal advisory for one to three of the SEQUI management systems
- three of the interviewees are solely QM employees; this is without a management function and without being integrated in a SEQUI team (see Table 2).

The interviewees from the two companies with up to 60 employees are responsible for all three systems. This indicates that small companies in particular inevitably practice integrated management and/or occasionally buy in consulting services.
The following table shows that attempts to integrate SEQUI systems already exist alongside the usual parallel strategies, even if in some companies these can only be described as undefined and latent and still in the developmental phase.

Table 2: Position of the Interviewee in the Company and Responsibility for a Management System

Data in absolute figures

Position of Interviewee	Field of Responsibility[1]	Number of Interviewees
Leading Position (e.g. Assistant to the Board)	S/E/QU	1
Leading Position (e.g. Assistant to the Board)	E/QU	1
Leading Position (e.g. Assistant to the Board)	S/QU	2
Leading Position (e.g. Assistant to the Board)	S/E	2
Leading Position (e.g. Assistant to the Board)	S	1
Head of internal advisory department	S/E/QU	1
Head of internal advisory department	S/E	1
Head of internal advisory department	E	1
Head of internal advisory department	Q	1
Interviewee without leading position	Q	3

6.2.1 General characteristics of the safety, quality and environmental management organisation

In the following, the legal basis for each of the fields safety, quality and environment, in so far as they exist (see also Chapter 2), will be described and the characteristic features of each management system in comparison to the others will be illustrated. In addition, besides our

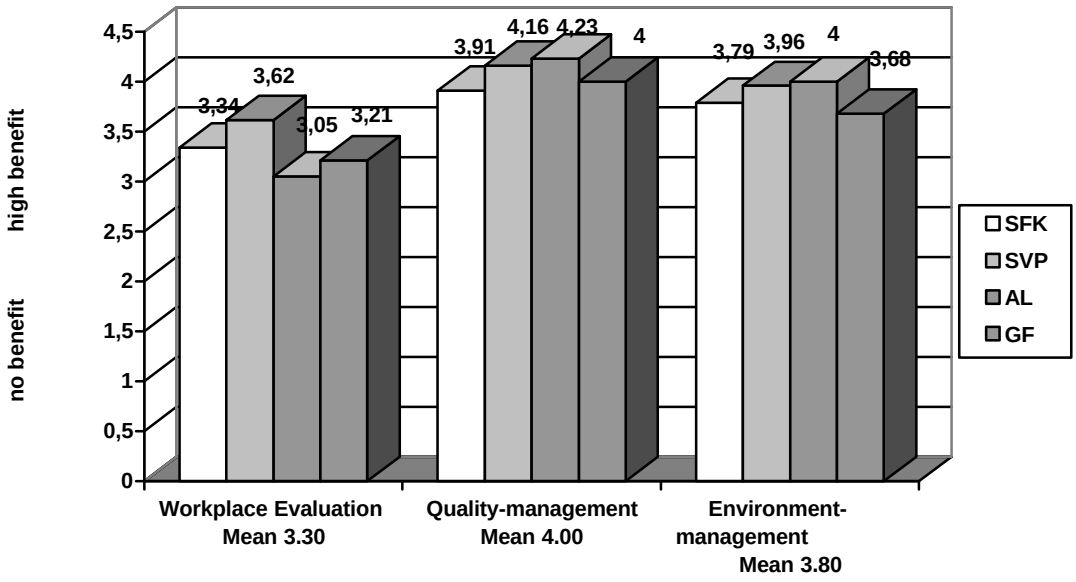
1 The following abbreviations are used here: QU for Quality Management, S for Safety Management, E for Environmental Management

own results, we will refer to other studies which already exist in this field in order to place our description in a wider context and increase its meaningfulness.

6.2.1.1 Positioning and organisation of protection of employees

As already mentioned in Chapter 2, the protection of employees is legally established in Austria through the Protection of Employees Law (AschG) BGBL No. 450 side 1.1.1995. This regulates the content as well as the number of hours of accident prevention duties per employee which, in turn, depends on the size of the company. Because of these existing legal regulations, questions about expenditure for employees' protection were not necessary in the interviews.
All interviewees confirmed that their company implemented and kept to these guidelines and safety requirements. Equally, all work safety regulations were complied with. In this area, the Law leaves little scope for individual company interpretation and decision-making.
In contrast to the measures in the fields of quality and environmental management, accident prevention duties were not seen by some of the interviewees as necessary and, in terms of business management, useful regulations: It is the state which dictates such measures „from the top„ which should ensure that they are kept to.
„The state thinks these up (accident prevention duties, M.S.-W.) and doesn't consider what it costs us„ (Company 6)
„When the labour inspector comes, we have to prove that we have a qualified safety employee: In our company, the employee qualified to deal with safety is the building supervisor who does unpaid overtime for the workplace evaluation.„ (Company 2)
„We have had difficulties in finding someone who would do the training. The law creates such difficult conditions that many of those who are interested are put off„ (Company 3)
Even employees qualified to deal with safety rate workplace evaluation as being of less use than quality and environmental management. This was established in a study carried out in 1998 for the Labour Inspection Service in which 115 companies were interviewed (see Illustration3).

Illustration 3: A Comparison of the Evaluation of the Use of Workplace Evaluation, Quality and Environmental Management
Figures in Percent



Source: BMAGS, 1998

The fact that employee protection is not highly regarded is also evident in our own investigation: In two thirds of the companies, persons involved in prevention duties are not really involved in company-political and decision-making processes.
Company 1 is an exception (see Table 1) as they have to prove they possess a certificate for „responsible care„. In this company, the person qualified to deal with safety not only has control but also performs a management function in the form of a representative function for the head of internal advisory department (The head of the department is the Quality Auditor). The advisory should be modified to executive power soon which gives executive rights to safety management and, therefore, enormously increases the power of the SFK.
With regard to the implementation of the employee protection law, the ASchG provides aid from external agencies for this purpose. Four of the companies interviewed made use of this aid.
An interesting, specific example among the companies interviewed was provided by the sub-dividing of employee‘s safety into „security„ and „safety„ in Company 8. „Safety„ is incorporated in environmental management and mainly includes the core competencies of SFK. A committee of seven employees works continually on themes such as materials, safeguarding of jobs etc. On the other hand, in the area of Security, themes include first aid, technical safety in the building, fire prevention, waste management etc.
We would also like to point out the frequent organisational combination of employment safety and environmental management. The combination of these two fields of competence is necessary for practical reasons in the day-to-day running of the company. This is probably the reason why the combination of these two fields is more frequent than the combination with Quality Management (see Table 3).

Table 3: The Combination of Competences in the Fields of Safety, Quality and Environment among the Interviewees
Data in absolute figures

Field of Responsibility	Number of Interviewees with this Field of Responsibility
Safety, Environment and Quality	2
Safety and Quality	1
Environment and Quality	1
Safety and Environment	4
Safety	1
Environment	1
Quality	4

The points of synergy for the integration of employee protection and environmental management were described by the interviewees as below:
„When one of the trees in our yard is chopped down, it concerns not only environmental protection but also employee protection.„ (Company 4)
„Hygiene matters concern both employees and the environment. In the case of dangerous materials, the SFK and the person responsible for environmental matters must work together.„ (Company 2)
„There are around 200 national laws which concern both fields.„ (Company 4)
This last quote points to the legal and normative density of regulations in the fields of safety and environment. Wirnspirger and Schramhauser (1997) point out that,

„…the situation that, in contrast to the nature of quality, proof of compliance with official representatives (and not customers) must be given„ „In Q-systems, laws play only an indirect role.„[51]

A possible reason for the organisational integration of work safety and environment lies in the technically oriented training of the SFK as well as the employees with responsibility for environmental matters and auditors respectively. This is shown in the investigation carried out here, as well as in a study carried out in 1995 by the Interdisciplinary Institute for Environment and Economy through the analysis of 66 questionnaires.[52]

6.2.1.2 Positioning and organisation structure of quality management in the company

With regard to the amount of working time used for quality management, it was found that in seven of the companies interviewed the employees responsible for quality management spent all their working hours involved in quality management issues; even if the term quality management is not strictly distinguished from other management fields. Three of the companies interviewed therefore included quality management in the fields of customer satisfaction and/or complaints. This also meant that in these companies more than one employee was concerned with quality management.

From the interviews it was possible to see a connection between the number of employees and the amount of time spent on quality issues; the more employees there are in a company, the more time is spent on quality management. This was valid for internal quality management employees as well as for the use of external consulting services (see Table 4).

Table 4: Number of Employees and Extent of Employment of Quality Managers:
Data in absolute figures

Number of Employees	Extent of Employment per Company	
	Full-time	Part-time
Up to 250 employees	0	5
Up to 700 employees	3	2
more than 700 employees	4	0

In the sample questioned, half of the large companies interviewed, as well as the representatives of SME's, fell back on external specialist reports in questions of quality. Particularly small and medium-sized companies are interested in consulting services; large companies, in contrast, less (see Table 5).

Table 5: Number of Employees and the Use of Consulting Services in the Field of Quality Management:
Data in absolute figures

Number of Employees	Use of Someone from Outside:	
	Yes	No
Up to 250 employees	4	2
Up to 700 employees	1	3
Up to 700 employees	1	3

51 Wirnspirger, Johann/ Pölzl, Uwe/Schramhauser, Hans: Das QSU Management, 1997 Wien, ÖGB Verlag, S. 78f

52 http://www.wu-wien.ac.at/inst/iuw/res/Um-beauf.html

In contrast, the hypothesis that the extent of employment in quality management correlates with the status as certified or non-certified company could not be proved.

Table 6: Company Certification and Extent of Employment of Representatives
Data in absolute figures

Certification in Field of Quality Management	Extent of Employment	
	Full-time	Part-time
Certified	5	4
Not certified	2	2
Certified in the field of Environmental Management		
Certified	3	2
Not certified	1	5

As mentioned above, the inclusion of quality management in the organisational structure of the company takes different forms. In the sample survey, three variations came to light:

- A common case is that one person (who perhaps volunteers out of his/her own interest) is chosen from the company and takes on a quality management role beside his/her original professional duties.
- Equally common is the inclusion as internal advisory, which mostly reflects a team character, through integration with Work Safety and/or Environmental Management Systems.
- In three of the companies interviewed, the integration occurred in the form of a matrix organisation: the employees responsible for quality were spread out through different departments which had established themselves in projects or processes respectively.

In contrast to employee protection and environmental management, it was possible to observe a more central positioning and therefore a greater relevance for quality management in company organisation in the sample survey.
The ÖQS, the only accredited and biggest systems certification board, has also undertaken more quality than environmental certification up to now (the ratio is around 14:1). However, on top of this, in quality management the future entrepreneurial potential can also be seen; this is shown in the continuous demand for this type of certification (ÖQS, http://www.oeqs.at/DIEOEQS.HTM).

6.2.1.3 Positioning and organisational structure of environmental management in the company

From the 14 companies interviewed, five possess an environmental certification. This means that the relationship of quality certification to environmental certification of 7:5 in our sample does not reflect the true situation in Austria. As we saw above, the ratio is around 14:1.
Three of the companies interviewed approach consultation firms for environmental issues. Consulting is therefore encountered far less often in this area than in the area of quality or protection of employees (see Table 6). Two of the interviewees could give no information about the environmental management in their companies due to the lack of an overall view in such a large concern (up to 45 000 employees).
As in quality management, the extent of employment in the environmental area varied with the number of employees (see Table 7).

Table 7: Number of Employees and Extent of Employment of Environmental Managers
Data in absolute figures

Number of Employees	Extent of Employment	
	Full-time	Part-time
Up to 250 Employees	1	4
Up to 700 Employees	1	3
more than 700 Employees	3	0

Analogous to quality management, there are also similar organisational patterns in environmental management:

- as mentioned above, in the form of integration with SFK and /or quality management
- the choice of a particular person to be responsible for environmental issues. This person then deals with this matter beside his/her other functions. This type of organisation is more frequent among companies which do not have environmental certification.
- integration in the form of a matrix organisation was not evident in the sample survey.

6.2.2 SEQUI management – integration of safety, environment and quality

The classical approach „A management system for every problem„ leads to incomprehensible and impractical juxtaposition of instructions and documentation. Even when these systems – seen in their own right – work, they entail enormous expenditure as three systems have to be implemented, maintained, monitored and adapted to fit in with changes in the company alongside each other. Beside rather practical reasons, there are also other reasons regarding the content which support an integration of the three management systems. Kerschbaummayr and Alber (1996) comment on this as follows,
„Environmental protection, quality and protection of employees have a great deal in common particularly when they are taken from their conceptual roots not as an appendix but as an original and integrated company responsibility.„[53]
However, around half of the interviewees in the survey sample cannot imagine an integration of SEQUI. It is largely the certificated companies which support an integrated management system (see Table 8).

Table 8: Certification and Attitude towards an Integrated Management System
Data in absolute figures

Field of Certification:	An integrated management system is	
	Imaginable	Unimaginable
Safety, Environment and Quality	1	0
Environment and Quality	4	1
Quality	1	3
No Certification	1	4

The following arguments, which are against integration, were mentioned in the investigation:

Size of company: In big companies there is the difficulty of the already established individual departments and the fear of losing an overview as a result of integration. Questions of

53 Kerschbaummayr, Günter/Alber, Sebastian: Module eines Qualitäts- und Umweltmanagementsystems, Wien 1996, Service Fachverlag, S. 193.

integration were unnecessary among the SMEs who use the services of consulting firms far more frequently than larger companies.
„In our quality department, we already have several employees as I can‘t deal with all the other departments as well. But safety and environment could be put together.„„ (Company 10)

The excessive demands on training and competence capacity: The difficulty lies not in the organisation or the processes but in the mastering of the specific fields with relevant specialist knowledge. The specialisation for all three fields is described as being so extensive as to be impossible for one person to manage. The SEQUI manager would have to be a „universal genius„.
„One person does not have the training capacity for all three fields, we would prefer to get an additional person in.„ (Company 6)

„The person who does it would have to be a „superman“ and also solve all the difficulties he faces alone. He would have no partners if there was no one else employed in his field.„ (Company 7, Company 14)

Costs: The problem lies in the financing of a comprehensive training. This leads to a preference for buying in consulting services.
„Employees who are sent on funded training courses often leave the company afterwards as we cannot afford to pay them the appropriate salary.„ (Company 6)

„If such an employee is ill or leaves the company, they then leave behind a huge gap to fill.„ (Company 3)

State of development and lack of interest in the three company aspects respectively:
„The safety specialist looks after five of our branches and we don‘t have environmental management, that will be interesting in the long-term:„ (Company 5)

6.2.2.1 Synergy effects

The other half of the interviewees supported the idea of employee protection, environment and quality agendas being integrated into a combined management field. These companies had around twice the number of certifications to show for themselves as opposed to the companies with the contrary opinion (see Table 8).
The following factors, which lead to problem solving and/or synergy effects, support integration from the interviewees’ point of view:

Time and instruction: All three fields require the systematic monitoring of the systems which in turn requires the employees’ time. It must be checked whether the activities of the employees are in accordance with those planned, orders are carried out effectively and the criteria determined for achieving goals are appropriate. A combined audit for all three fields would therefore reduce the amount of time involved and possibly remove task incoherence for the employees:
„Employees are often stopped from doing their job four times; first the safety specialist comes and checks something, then the quality manager wants something different and disturbs him again and so it goes on. Controlling and evaluation should come under the same hat„ (Company 4)

„Human resources would be made better use of.„ (Company 8)

„Through fewer audits, one is better accepted by the employees.„ (Company 1)

Documentation: All three fields require company-specific handbooks and system and instruction documents which are usually kept separately. But,

„….*the biggest synergy effect* (of the SEQUI Management System, M.S.-W.) *is achieved by the integration into a common handbook.„*[54]

„Instead of three handbooks, we now only keep one„ (Company 8 and Company 6)

„Reduce bureaucracy.…„ (Company 1)

Harmonisation: In processes which run parallel to one another, polarisation is inevitable as different interests are represented. In contrast, in the joint operation of S,- E,- and QU,-aspects, responsibility is evenly distributed:
„There can be no prioritising. The employee responsible for the environment, the SFK and the quality manager fight amongst themselves to see who is more important.„ (Company 1)

„You can use the experience and advantages of the other systems:„ (Company 8)

„Dismantle the job-specific way of thinking.…„ (Company 2)

Beside these synergy effects, the interviewees who support SEQUI cite the enormous rate in the development of laws and norms, above all in the fields of environment and employee protection, as further reasons for an integrated management system. The experience of the interviewees also showed that, as a result of management systems being introduced separately or following one another, higher costs were incurred which could have been avoided by an integrated SEQUI system.

6.2.2.2 Core competencies

In the opinion of the interviewees, the primary core competencies of integrated management are exemplified in the following fields:

Process management: The majority of the interviewees emphasised the relevance of the SEQUI manager‘s process-oriented way of working. Nonetheless, in the current literature on management as well as in several consulting companies (their offers) there is some confusion of terms in the area of the integrated management concept[55]. This lack of clarity in terms is reflected in the answers of our sample survey. So, for example, the interviewee from Company 4 talks about knowledge of methods and means process management:
„The SEQUI manager must have knowledge of methods, that is to say implementation, evaluation, checking whether procedures are being kept to, about the creation of processes. To whom do the processes belong? – The specialist knowledge, on the other hand, that‘s what those concerned, the employees, have„ (Company 4)

The concrete experiences of „Company 1„ in the change from ISO-9000 to the revised form 2000 showed that the process approach really does meet the requirements of the SEQUI management processes. Kerschbaummayr and Alber note that,

54 Kershbaummayr, Günter/Alber, Sebastian: Module eines Qualitäts- und Umweltmanagementsystems, Wien 1996, Service Fachverlag, S. 66

55 Kerschbaummayr, Günter/Alber, Sebastian: Module eines Qualitäts- und Umweltmanagementsystems, Wien 1996, Service Fachverlag, S. 9

„Process- orientation has a great future… Process-oriented organisation and implementation are particularly suited for an integrated SEQUI system.„[56]

Legal procedures: At the present time, environmental laws and employee protection laws are legally binding. In contrast, quality norms are non-binding recommendations. In recent years, the number of laws concerning these fields has increased dramatically.
As a result of this, the interviewees see the continuous observation and appropriate implementation of these regulations within the company as being vital. Also mentioned was the desire that SEQUI managers should assume juridical responsibility (liability).

„…….as a result of the explosion in the number of laws in the fields of environment and employee protection, someone is required who can translate them into company language„ (Company 7)

6.2.2.3 Organisation forms

With regard to the form of organisation, there was no clear vote as to whether a consulting or executive power solution should be striven for. The majority of the interviewees stressed that it was more the interest in and acceptance of SEQUI aspects from the side of the company leadership that was the crucial factor.
In the following, the relevant components of these various forms of organisation are characterised:

Internal advisory: „Independence„ is the component mentioned here as the central factor.
As an internal advisor I can operate more freely and am not at the mercy of economic pressure.„ (Company 8)

On the other hand, the danger exists that the company top dogs only want to present a modern organigram to the public, and do not really take the responsibilities of SEQUI management seriously[57].

Executive power: Here the factor „achievement„ is emphasised as being a particularly positive factor. Through this, „Company 1„ in connection with Revision 2000, modified their already integrated Consulting into an Executive Power. The desire for more exertion of influence was also expressed as the bon mot of the interviewee from „Company 4„
„The SEQUI Manager should be above the General Director.„ (Company 4)

6.2.3 Training to be a SEQUI Manager

The level of satisfaction with current training programmes varied among the interviewees - evaluations ranged from excellent to inadequate. Complaints were made about the lack of an overview of the training market.
In the field of employee protection, the training of safety specialist (SFK) was criticised for its lack of methodological and social competence. The training of SFK's concentrates too much on control and too little on process monitoring.
Furthermore, up until now, employee protection has not been understood as a management task but limited to the „function" safety specialist. The safety specialist cannot follow any management strategies due to legal handicaps.

56 Wirnspirger, Johann/Pölzl, Uwe/Schramhauser, Hans: Das QSU Management, 1997 Wien,ÖGB Verlag, S. 229

57 Kerschbaummayr, Günter/Alber, Sebastian: Module eines Qualitäts- und Umweltmanagementsystems, Wien 1996, Service Fachverlag, S. 229

The knowledge of the interviewees with regard to the training of environmental managers was somewhat sparse; it was supposed that the training market did not offer sufficient numbers of training possibilities. There were, however, de facto around 900 training courses offered by over 100 consulting firms (see the Interim Report, p4 regarding this).
There were no concrete points of criticism regarding quality management training.
In the answer to the question of the ideal programme for the training of SEQUI managers in the future, two basic types of education were brought up for discussion:

a)Further education on the job: This is aimed at people already working in one of the SEQUI systems who can „progress" through further education to become a SEQUI manager.
b)University education: This is aimed at people without practical experience who wish to train to be a SEQUI manager.

The vast majority of the interviewees supported type a) training.
A plea was made to provide a way in which future SEQUI managers could come from the „coalface" and then attend full-time further training. A one-off training course is, in the view of the interviewees, not adequate; particularly with regard to the ever-changing laws.

Table 9: A Comparison of Different Qualification Models for SEQUI

Possible Qualification Route	Agreement to Item
University Education or College	5
Further training on the job with practical experience and knowledge of the industry as entry requirements.	10
no training necessary, learning by doing	1

The main arguments for these types of further training are

- Practical experience and
- A good knowledge of the industry (see Table 9)
- Without the acceptance of the employees – according to the interviewees – the SEQUI system cannot succeed. Such acceptance is learned through higher social competences, which are not, theoretically, able to be learned to the level required. People with a good knowledge of the industry still won't to be taken seriously in internal company practice.

„He must come from the subject, otherwise he has no chance of pushing things through. The Gutwinsky model (see Case Study Nr. 1) is not demanded in the industry." (Company 6)
„If someone doesn't know the field, then it's easy to lead him onto thin ice." (Company 1)
„The crucial factor is that he can relate to people." (Company 5)

The advantage of type a) is that such a form of further training can start from the background of the particular company and address its particular needs and requirements thus „extracting" exactly what can be immediately used.
A counter-argument for type a) came from Company 1 which mentioned the time problem: future SEQUI managers must be given time off for the training, consuming further time and creating costs for the company. With type b) training, in contrast, the company saves the time and various course fees.
Type b). Three of the companies interviewed supported the university or college type training. Here, the importance of project work and practical placements respectively was emphasised.

This was seen as a means of gathering practical experience and increasing the chances of finding a job later (see Case Study NR. 1).
To reinforce the theoretical knowledge acquired, the graduate should then gather experience by working for a few months as an „assistant“ in SEQUI management before taking over a SEQUI management place autonomously.
The central element in training should be competence in the methods of management systems; the employees already have the necessary company specialist knowledge („Company 4“). To weaken the argument about lack of practical experience, the interviewee from „Company 12“ emphasised that, basically, the methodological knowledge of SEQUI management graduates must, like all knowledge from training courses, be adapted to the particular company.

6.2.4 Looking ahead: fields where SEQUI management systems can be used

The implementations to date relate mainly to internal SEQUI management. Around half of the interviewees mentioned arguments that are aimed at a movement of SEQUI management competence into the consulting arena.
As SME’s tend to fall back on consulting and due to the dominance of small and medium-sized companies in Austria (around 90% of Austrian companies are small and medium-sized), the competent, qualified SEQUI manager will generally find his field of operation in consulting firms.

6.3 Report from France[58]

Sample of enterprises interviewed

Sector of activity	Number	Of which SME
Agro-industry	9	
Chemical Industry	5	
Industry and Energy	6	
Manufacture	2	
Services	6	
Total	**28**	**12**

Sector of activity	%	Of which SME
Agro-industry	32%	
Chemical Industry	18%	
Industry and Energy	21%	
Manufacture	7%	
Services	21%	
Total	**100%**	**43%**

The schedule is as following

- How many new profiles are necessary in your opinion?

One profile 32%
Several profiles 10%
Didn't answer 16

- Could you describe the main skills of these new profiles?

Managerial 32%
Technological 18%
Didn't answer 14

- What should be the „background" of this professional profile?

Economic 1 answer
Technological 11 answers
Organizing 6 answers
Juridical 8 answers
Scientific 8 answers
Managerial 14 answers

- What are the institutional paths for the training of this profession?

Systems of schools (Engineer) 32%
Professional training 11%
Practical training 7%
Didn't answer 13

[58] The Sequi team from France submitted 28 interviews. Main questionnaires from Sabrina Bandini (Italy) and Maria Schwarz-Wölzl (Austria) were evaluated. About 50% of the questions were not answered.

- Could you point out the factors which have contributed to the evolution of the demand for these new profiles?

Globalisation of the markets	14%
Development of the law system	32%
Technological innovation	7%
Didn't answer	13

- Was the creation of new profiles brought about by the new Laws of the State and of the European Community? (Elaborated by Dr. Tamburelli)

Yes	50%
No	7%
Didn't answer	12

- What is your opinion about the quality of vocational training offers for graduate students in relation to existing needs?

Complete	11%
Incomplete	21%
Inadequate	4%
Didn't answer	15

Organisation and activity in the area of QSE

Regarding the question: Is there a need for the professional competence of QSE? We found out that there are hardly any internal definition and expectations of the role of a Sequi manager in enterprises. The function of a Sequi manager is a strategic function with managerial function.

Work profile

Critic:
- existing training offers deal with the legal aspects in too much detail
- on theoretical orientation
- lack of culture and management technique

Expectations of work profile and training:
- Rights
- Management competence
- Technology are the most important competences, in addition to that
- Time management
- Organisation training
- Communication training
- Problem solving competence
- Environment management

Summary

The majority of the interviewees are in favour of a work profile which aims primarily for management competence, followed by technical competence. Regarding work background, management competence and basic technical training are preferred. Most of the interviewees (32%) suggest the training field of „Engineer“ for the work profile of the Sequi manager.

According to them, the demand for the new work profile of the Sequi manager is due to legal developments in the European region. Present training offers are regarded by the interviewees as inadequate.
More than half of the interviewees who answered this question find that the present training offers are not satisfactory:

„...because there is a lack of managerial and scientific culture..."
„...good technical preparation, but bad ability in management..."
„...better juridical training..."
„...it is important to have an approach of both specifics (safety, quality and general management)..."
„... the managerial skills needs to be improved..."

6.4 Comparative summary of the national interviews

The data collected in Austria were evaluated quantitatively and qualitatively as opposed to the other two national reports. A comparison of the statistical results is therefore not possible.

Demand for Sequi
The Austrian report brings a differentiation to light: the analysis of the interviews confirms a general trend towards integration, although these are enterprises which already have plans for certification or at least a relevant awareness for process optimisation through safety, quality and environmental management. However, enterprises with little information or awareness can hardly envision such integration.

Professional profiles
The majority of the interviewees share the opinion that a multi-disciplinary distinction is necessary for the complexity of SEQUI management. The demands on a Sequi manger are in no way fulfilled through a single profile. The main skills are made up of technical, legal and high social competence.

Suggested background of the Sequi profiles
The interviewees preferred a technical and/or scientific background as well as source occupation; however they point out – and this is particularly stressed - the importance of social competence.

Position in the enterprise
The majority of the interviewees are of the opinion that the Sequi manager should be recruited from the staff and placed in the manager role. This approach aims for the situation that e.g. the function “safety officer” also adopts the “manager” role through specialised education. Regarding this question, the Austrian interviewees were of another opinion: on the one hand the advantage of a staff unit with regard to independence up to the uppermost management is present, on the other hand the Sequi manager also needs a certain executive power which is however not established in a staff unit.

Evaluation of the available training offers in relation to business needs
In all three countries involved in the Sequi project, the dissatisfaction with the present training offers is clearly shown. One virtually unanimous opinion is that the training shows a lack at practical reference to business needs. In addition, a general lack of methodological and social competence development is established. Especially in the training of the safety manager the focus is directed too much on control and too little on process monitoring.

Guidelines for the training formation
- Dialogue between theory and practice is uppermost paradigm: the importance of practical training is particularly stressed in order to acquire the practical application of theoretical knowledge.
- Practical training should not be placed only at the end of training but should already be applied during training.
- It would be possible to perform a practical training as „Sequi manager assistant„
- Ideally, the training of a Sequi manager should be more than just a succession of training elements. The training concept must therefore fulfil the requirements of a system of knowledge and management.

- The focus in training should be directed towards learning integrative management methods –internal business special knowledge can be acquired on the spot.

7 Case studies of professional profiles in SMEs

The case studies concentrate on

- the identification of internal SEQUI formations in SMEs and should be placed equal with models of good practice. The selection criterions were SMEs with the integration of two or three systems already implemented.
- the analysis of the training offers
- suggestions for training profiles with regard to SEQUI

Italy carried out a case study in an ecological service-business.

Austria chose a service enterprise in the industry sector as case study.

France carried out two case studies a.) production business in the mineral industry and b.) commercial enterprise in a harbour.

The following interview guide, prepared by the AL Forum project co-ordination, gives insight into the questions:

Draft for the realisation of the case studies on safety, environment and quality integration

Information about the enterprise

1. *Description of the enterprise*

2. *Enterprise orientation to the new market needs*

3. *Changes that have taken place over the years and existing transformations*

4. *Adjustment to industrial safety regulations*

5. *Observance of ISO environmental certification standards and procedures*

6. *Observance of Community environmental protection standards (Ecoaudit and Ecolabel)*

7. *Management of safety, environment and quality services*

8. *Information about Safety, Environment and Quality Officer/s*
(education, post–degree training, formal acknowledgement in the enterprise)

9. *Analysis of the present vocational training offer compared to the enterprise field of activity needs*
(enterprise training needs over the recent years, training supplemental suggestions)

10. *Evaluation of the need for new professional profiles and required competences*

7.1 Case study from Italy[59]

Elite Ambiente S.r.l[60].

ENTERPRISE INFORMATION

1) Enterprise description

2) Market orientation of the enterprise

3) Evolution of the company and changes in progress

4) Settlement in the company of safety in working environment norms (Italian law 626/94)

5) Observance of ISO environmental certification standards in the company

6) Observance of European Community standards regarding environmental protection (Ecoaudit and Ecolabel)

7) Management modalities of quality, safety, environment

8) Information concerning the people in charge of Safety, Quality and Environment (Basic training, Post-graduate training, formal recognition of his role in the enterprise)

9) Analysis of the existing training systems with regard to the specific needs of the enterprise (Training needs of the enterprise during recent years. Suggestions for training)

10) Market needs of experts on integrated safety, quality, environment management and background requested

59 by Sabrina Bandini (Cra Montecatini) & Andrea Contarino (Elite Ambiente S.r.l.)
60 Ltd

Introduction

Hardly a day passes without reports in the media of incidents in which there is a risk of harm to the environment or people's health and safety. These risks may result from industrial accidents, food safety problems or other causes. These incidents, and untold numbers of near misses, have significant cost implications for organisations (compliance, public image).
Environmental Management Systems (later on SGA)[61], have begun to spread in Italian companies quite recently and it has happened with a certain delay with regard to other European countries both for economic and cultural reasons.
In Italy, on February 1999, 112 organisations were certified ISO 14001. In May 1999, just 12 of the 112 companies, were registered by the Regulation (CEE) n.1836/93.
The Multinational SGA-Thomson, the first company who decided to agree to Emas, owns three registered sites in Italy. Of the others, five are owned by foreign companies. The other six sites belong to Italian enterprises.
Montecatini decided to focus on Elite Ambiente srl. Elite Ambiente is a small enterprise which has obtained the double recognition: ISO 14001 certification and site registration. It is an emblematic example of the Italian north-eastern economy made up of small and medium enterprises.
In Italy, it is uncommon to find a SME equipped with a SGA (ISO 14000 certification and EMAS registration of its site). A SME which wants to settle a SGA faces more difficulties compared to a big enterprise.
These difficulties are mainly caused by the size of the economic and financial intervention and the probable lack of organisation and cultural background in a SME. On the contrary, Elite demonstrates that "Environment" can be a strategic opportunity for a SME and that its organisation can be learnt as a model to follow, also for companies of bigger size.

7.1.1 Enterprise description

Elite Ambiente S.r.l of Brendola (VI) is a service enterprise. It has been operating since 1987 in the ecological field. It has developed its activity which consists of building plants directed to industrial wastes regeneration.

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61 Aim of the Environmental Management System is to carry into effect in practice Environmental Policy. It introduces the concept of continuous improvement of site environmental performance through control and verification systems like:
environmental analysis, environmental policy, environmental goals, environmental programme, management system, control and monitoring, internal audit and environmental declaration. The SGA also has the function to communicate in a more transparent way with local communities through the Environmental Declaration.
In Elite Ambiente, SGA is based on the structure and general organisation of the enterprise (see the organisation chart included).
Some advantages arising from the SGA implementation in the enterprise are:
- Systematic approach to environmental management in all the sites of the company thanks to the integration between different functions;
- Improvement guarantee of the environmental performances;
- Professional improvement of employees involved in continuous training;
- Improvement of the relations with local and competent Authorities.

SGA efficiency is evaluated periodically by competent auditors.
Such verification concerns the evaluation of the conformity degree with regard to the Regulation CEE n. 1836/93, norm UNI EN ISO 14001 and what is decided in SGA firm hand-book.

The enterprise was founded at the beginning as a S.a.s. and was changed in 1993 to a s.r.l.
In December 1998, 8 employees and 4 members emerged to be invested in the different enterprise activities.
Its business amount in 1998 was 2.727 million Italian lire.
Elite has at its disposal a plant where different operations (choice, cleaning, grinding, washing and mincing) of waste materials are carried out.
The aim is to obtain recycled products.
In accordance with current environmental laws, Elite Ambiente carries out (on the site) activities of waste collecting and transport for the treatment of recycling waste. The wastes gathered are destined to external plants authorised for recycling and removal. Such activities are excluded from the Emas validation because they are not directly connected with the site.
In 1996 Elite Ambiente participated in a European project for SME regarding the adhesion to EMAS (Community System of Eco-management and Audit).
Elite set in motion its Environmental Management System during the first months of 1997. In 1998, Elite had completed SGA implementation and worked out its Environmental Declaration.

7.1.2 Market orientation of the enterprise

The enterprise carries out its mission of environment protection transforming industrial wastes to raw materials for a new usage, by treatment operations on waste refusals.
Attention is particularly given to:
Getting rid of waste deriving from working cycle;
contamination risk of the ground and river (Fiumicello Brentella);
visual impact and exterior aspect of the site;
optimisation of energetic resource use.
Elite operates through a system able to respect the current laws and evaluates the environmental risks which could arise from its activities. Great attention is given to the cleanest and economically practicable technologies.
Eco-management is considered a model of efficient work and the personnel involved are in continuous training **.**

7.1.3 Evolution of the company and changes in progress

The choice to adopt a SGA confirms the will of Elite to maintain the high percentage of waste recovery 62.
The period of putting SGA into effect started in November 1996, with the commitment to a project promoted by European Community (DG XII) and C.P.V.63 (Euro management - Environment). The aim was to verify the feasibility of a SGA application in SMEs (it lasted until January 1998).
SGA accomplishment has developed through the following passages:

- Definition of the environmental policy;
- Analysis of the activity impact on environment, (facilitated by a study of waste stockage already carried out and presented at the Regione Veneto in 1995);

62 From data collected in MUD (Model of waste materials sent to the Chamber of Commerce) it results in 1997 and 1998 of 10.000 tonnes per year of treated waste, more than 97%it has been destined to new use.
63 Productive Centre Veneto – Room of Commerce Foundation of Vicenza.

- Definition of the main objectives of the programme;
- Definition of the company structure (organisation chart);
- Drawing up of a SGA hand book procedures and operative instructions relative to the site in question;
- Planning of a suitable information and training project of its personnel.

In January 1998, in order to verify SGA conformity to the norms of the Regulation (CEE) n.1836/93, a first internal audit was performed.
During the internal audit, consultants found 13 non-conformities both of organisational and document type.
The first inspectorial visit by Certichim Institute[64] took place in March 1998. This step aimed to verify if the activities occurred in the site were in accordance with Emas Regulation.
In this stage, Elite has been suggested firstly to obtain ISO 14001 Certification and afterwards, EMAS Certification.
And once the 5 non-conformities were found corrected by the Inspectors, Elite Ambiente was evaluated as suitable to obtain the Certification in accordance to UNI EN ISO 14001 Norm.65
The enterprise finally faced a supplementary visit by Certiquality with the aim to conclude its path to Emas.66 The following months have been dedicated to the elaboration of an environmental declaration in conformity with Emas requisites.
This last environmental declaration was validated by Certichim67 and by the section Emas of the Committee for Ecolabel and Ecoaudit68 (the site of Brendola has been given the registration number I-S-000011).

7.1.4 Settlement in the company of safety in working environment norms (Italian law 626/94)

DLgs 626/94 (modified by DLgs 242/96)69 introduces a preventive and
firm safety system based on the active participation of its workers.
This law obliges a company to create a Protection and Prevention Service (SPP). In Elite Ambiente SPP was settled in January 1997.
The law settles in an intermediate position a qualified doctor who has operative and consultative functions.
An active role is entrusted to all workers.
They are involved in both prevention activity - with the institution of Safety Workers Representative - and the management of fireproof activities (evacuation and first aid).

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64 Environmental controller confirmed by Ecolabel-Ecoaudit Committee and certify UNI EN ISO 14001 confirmed by SINCERT
65 The official given of conformity certificate was in May 1998 the 26th.
66 29th of April 1998
67 15th of December 1998
68 22nd December 1998
69 The experience acquired in international field and expressed orienteering by "Recommendations" "Conversations" and by other instruments like the ones of Work International Organisms (Work International Organisation BIT/ILO and Social Security International Association), furnish wild suggestions about firm oraganisative modalities and relative dedicated structures.
"Prevention principles" expressed by CECA (1967) are considered particularly indicative in regard to organisational instruments and criteria to adopt in enterprise for Work Security. They find wild riscontro in Community Directive 89/391/CEE . The can be identified today in the Italian law of the recepimento of the same Directive (DLgs 626/94):

In general, in Elite Ambiente:

- Management considers the promotion of work safety and hygiene as a fundamental part of its duty and diffuses in writing the fundamental prevention principles to all the personnel;
- hygiene and safety activities are integrated in production activities through the involvement of each level of each division;
- Management and divisions follow the suggestions of a specialised Safety Service (SPP) - directly depending on Management- for all the actions of safety on work;
- Each member of the hierarchy, independent of his level, has to carry out safety on work duties in his competent division and refer to his chiefs;
- A coherent programme co-ordinates the safety on work activity, and it is updated by periodic reports.
- Workers Representative is involved in the elaboration of safety programmes. His collaboration in each security on work sector is fundamentally important;
- The safety programme consists of different stages (preparation, application, execution checking, evaluation and utilisation of results); it also has to be inspected by the close study of risks concerning the whole activities, even before accidents take place;
- Training of the whole staff on „safety at work", besides technical aspects, is fundamental.

Elite Ambiente carried out a „**Prevention Policy** ".
This policy consists of operative programmes and suitable technical supports[70].
The duties of the person in charge of the Safety[71] and with partial delegation from the owner of the company, are the following:

- Focus of risk factors;
- Risks evaluation;
- Choice of the suitable measures for work environment, safety and health;
- Elaboration of preventive and protective measures;
- Adoption of control systems;
- Elaboration of safety procedures concerning the different firm activities;
- Planning of training programmes for employees;
- Participation in meetings dealing with health and safety at work.

Elite implemented in its organisation the norms of safety and trained its personnel towards the following actions:

- in 1997 it conducted a course for 13 people financed by the Social European Fund and entitled „Safety in enterprises of waste treatment". The course concerned the risks of this kind of enterprise and lasted 40 hours. At the end of the course an attendance certificate was released.
- when a particular load arrives, a specific training is carried out;
- Every year from 1997 fireproof training was done. The entire personnel of Elite, 13 people, participated.

70 In particular it has decided to acquire a prevention and protection system. It is a service in staff to the Management, internal to the one of Security, Quality, Environment.
71 RSPP – Prevention and Protection Service Responsible), in compliance with article 9 of the Legislative 626/94

- The new personnel in Elite are informed by a special Vocational Training Programme (as foreseen by the Article 22 of 626/94 law).

7.1.5 Observance of ISO environmental certification standards in the company

For a company, to respect the environmental standards is an important key to strength its position in the market.
ISO issued ISO 14000 norms and its principles belong today to the cultural background of each manager involved in environmental problems.
Furthermore:

- examining ISO 14000 and Emas Regulation, it is possible to realise the quantity of contact points designated to increase after the revision of the Regulation.
- Ecolabel and Ecoaudit Italian Committee72, has established that Environmental Auditors can consider the ISO 14001 certification as a starting point for the EMAS registration.

The substantial differences between EMAS and ISO 14000 are the following:

- EMAS focus on environmental performance;
- ISO 14000 focus on the correct running of the management system.

Elite Ambiente srl obtained the Certificate of ISO 14001 Conformity on the 26th of May 1998.

7.1.6 Observance of European Community standards regarding environmental protection (Ecoaudit and Ecolabel)

Elite Ambiente doesn't have products certified with Ecolabel.

7.1.7 Management modalities of quality, safety, environment

Process description:
Elite Ambiente collects both recyclable and non-recyclable waste from its clients to destine to new use or recovery as raw materials. Personnel are adequately prepared to verify material conditions. One other important task of the staff is to inspect the presence inside of waste of polluted substances which are possibly dangerous for workers and environment health.
The material is taken form the clients with authorised means of transport belonging to the enterprise. The means are conducted by personnel adequately prepared for the execution of such activity.
For the transport 5 motor vehicles are available.
Collected materials are worked in the site of Via Natta, 13 in Brendola (Vicenza).
Upon their arrival in the site, the wastes are selected according to the foreseen Elite procedure.
The selection includes checking the material conditions, following which, the materials are divided in two main categories:

- Packing in good conditions. It is tidily arranged in the large square of Elite Ambiente. It will be sent to other enterprises plants to be again utilised in other production cycles;

72 Committee internal to Environmental Ministry

- Packing and other type of waste which will have a new use after previous treatment.

Plastic boxes are collected empty and are classified as not dangerous. They could be dirty of the products they have contained. These ones can be defiling and classifiable as dangerous substances. They are submitted to a smashing, washing and mincing process. It utilises a chop machine with a rotating roll connected to a plant for water circulation. It is characterised by a closed circuit with the aim of reducing consumption and production of liquid wastes. Usually rainwater is used for washing. Once the treatment process is concluded, the material is ground, put into sacks and left in the large square. The product worked in that way is in small scales and is sent to the enterprises of clients. It is then utilised as raw material and second material for the production of regenerated granule or plastic articles.
The other recyclable wastes like film di polietilene, paper, glass, wood, metallic material, are classified as not dangerous. They are divided by typology and collected in covered boxes. Afterwards they are sent to other enterprises plants which provide for their recycling. The boxes utilised for the storage in the uncovered area are airtight: this avoids the dribbling of polluted liquids.

Elite Ambiente believes that the development of production activities should satisfy both environmental and future/present generations needs 73.
In Elite, the person in charge of Environment, Quality, and Safety Services accomplishes different tasks. He is in charge of the Environmental management system and the Prevention and Protection Services.
His duties are the following:

- He takes part in the definition of a SGA organisational structure(organisation chart);
- He elaborates and writes down procedures and instructions of work necessary to SGA;
- He takes part in the elaboration of the Environmental Policy which will be examined by RD and approved by PAD74;
- He classifies, according to the procedure, environmental impacts and takes care of the relative Register (RIA);
- He elaborates environmental goals involving the whole personnel. He verifies their achievement;
- He elaborates the Environmental Programme. He verifies its feasibility and reviews it periodically;
- He looks after the file of the Project schedules;
- He takes informed PAD and RD about the Environmental Programme state of Art;
- He updates periodically the management with the latest regulations in the environmental field. He takes care of the Regulation Company Register;
- He takes care of personnel training needs to implement SGA within the company;
- He realises information activities for personnel;
- He elaborates an Environmental Declaration;
- He answers through the Note Schedule to the questions of the personnel of the company or external personnel;
- He responds of the SGA Documentation management;

73 From this point of view it is important that all the activities keep in mind the question of environmental safeguard considering that like integrating part of the productive process (In the Directive 96/61/CE (art.2) it is intended for pollution "the direct or indirect introduction of substances, vibrations, heat or noisy in air, water, ground which could be hurtful to human health or to environmental quality or that they could cause deterioration to material goods or damage to environmental ricreative uses and others).

74 RD: Direction Representing RAT: Technical Assistance Responsible PAD: Delegated Administrative President

- He manages non-conformities by taking care of their registration;
- He examines periodically modalities of load inspection and acceptance.
- He elaborates the procedures to select raw materials and takes care of data collection concerning the selection;
- He identifies bad workings and breakdowns in plants. He then plans the most suitable corrective actions and submits them to Rprod;
- He receives every signal of environmental emergence. He assists Rprod in the actuation of corrective actions and provides to the Registration;
- He plans the campaign of environmental data collecting according to necessities picked out;
- He elaborates maintenance programme and takes care of relative registrations through the collaboration with RAT;
- He carries out environmental suppliers evaluation and takes care of relative registration;
- He verifies preventively intervention projects characterised by important environmental impact;
- He responds of his own activity during the Audit and to PAD;
- He predisposes and participates to SGA re-examination.

It could be explicative at this regard, table at page..
It was brought up to date in April 2000. It shows approximately the time necessary to SGA maintenance (129 days per year).

DURATION OF RSGA TASKS

He takes care of the Register (RIA)	1 hour	Day
He manages identification, recording, adjournment and access to normative and regulation dispositions. He takes care of Normative Dispositions Register.	1 hour	Day
He realises Information activity of personnel.	1 hour	Week
He manages answers to personnel communications. He manages the dialogue with the externals through the Note Schedule. He manages, in general, the utilisation and registration of Note schedules.	2 hours	Week
He examines periodically the execution of verification modalities and load acceptance	1 hour	Week
He elaborates the environmental evaluation of Programme and takes care of relative registrations.	2 hours	Week
He elaborates data collection relative to raw materials selection activity.	3 hours	Month
He verifies periodically Environmental Programme. He follows the utilisation of Project Schedules. He manages the registration of Project Schedules.	4 hours	Month
He takes care of maintenance registration.	1 hour	Month
Monthly Report	8 hours	Month
He takes care of personnel training in regard to the efficient SGA working.	30 hours	year
He manages non- conformities and takes care of their registration.	10 hours	year
He participates to the definition of SGA organisational structure (organisation chart)	2 hours	year
He takes part in the elaboration of Environmental Policy. He draws it for the examination by RD and the following approbation by PAD.	4 hours	year
He classifies environmental impacts.	8 hours	year
He elaborates environmental aims and verifies their achievement. He involves the entire personnel.	8 hours	year
He elaborates the Environmental Programme. He verifies its possibilities of accomplishment and the respect of it.	8 hours	year
He elaborates maintenance Programme.	2 hours	year
Audit activities (second year)	40 hours	year
He predisposes and participates to SGA second examination.	40 hours	year
He does preventive environmental verification of each intervention project characterised by important environmental impact.	2 hours	When necessary
He elaborates and writes down procedures and instructions of Work necessary to SGA.	4 hours	When necessary
He elaborates Environmental Declaration.	40 hours	Triennial

Total days	Total Months	Total weeks	Total Year
2	16	6	152

7.1.8 Information concerning the people in charge of Safety, Quality and Environment

(Basic Training, Post-graduate Training, Formal recognition of the role in the enterprise).

In Elite Ambiente, Andrea Contarino is in charge of the integrated Management of Quality, Safety, Environment (SGA) a multidisciplinary area embracing scientific, engineering, social, economic and policy issues. He also covers the roles of SPP (Prevention and Protection Service) Responsible and Technical Assistance Responsible.

About his education:

He took a diploma of industrial chemist at the experimental Technical Industrial Institute „Giulio Natta of Padova" and completed his training with the achievement of a Professional Practice Certificate issued by the non-graduate engineer College of Padova. He finally obtained the qualification for practising the profession of non-graduate engineer.

Andrea Contarino improved his qualification through different specialisation courses[75]. His tasks in Elite deal with SGA Implementation and Maintenance. He also attends the planning and supervision of the activities connected with the safety of Work place.

He takes care of the personnel Training concerning the environment.

Andrea Contarino has carried out several technical consultancy experiences[76].

He has been called to intervene as rapporteur in numerous congresses.[77] He has been supervisor of the work of a thesis dealing with Elite, titled „Environmental Management System: a SME firm case"78.

75Firm internal course at Elite Ambiente dealing with Environmental Management System.
Qualification Course for internal Auditor concerning Environmental Management System at Certiquality of Milan.

76 1995-1998, Data Medica Spa, PD .Appointment of Work Security Technician. Functions of: Pointing out risks in Work Environment for different productive units(small and big enterprise); advice in the application of Norms.

1993-1995, Chemical Professional Office of Doct. Orlandi, PD. Appointment of Technical employee. Functions of: environmental pointing out and chemical analysis; advice concerning the resolution of chemical ecological environmental problems of the venetian SME.

Advice and collaboration activities concerning Work Security, Anti-fire, emergence plans.

77 ANPA Congress dealing with Emas attribution problems in enterprise (1999, Rome).

Seminary promoted by Union Camere of Milan in collaboration with Environmental Ministry for an Emas implementation project in waste sector enterprises (1999, Milano. Seminary dealing with certified enterprises experiences in environmental field, at Treviso Tecnologia (1999, Treviso).

Debates at Rimini Fiera in occasion of the event Ricicla 99 concerning Environmental Certification as tool to increment the amount of recycled waste (1999). Teaching at Luisi Management in regard to a training course promoted by Environmental Ministry titled Sustainable Enterprise, culture, organisation and tools for Environmental Management (1999, Rome).

Seminary for ARPA in collaboration with ERVET concerning Emas, Iso 14001 and progresses in regard to integration between the two standards (1999, Reggio Emilia).

Seminary dealing with the new Emas Regulation: The community system of Eco-management and Audit organised by Venetian Productivity Centre (1999, Vicenza).

Teaching at Luiss Management in the course of firm Environmental Management (2000, Rome).

AIAS Congress, in collaboration with Assindustria Udine dealing with SGA culture diffusion in Friuli (2000, Udine).

78 It was discussed at Verona University (faculty of Economy) and then published.

7.1.9 Analysis of the existing training systems in regard to the specific needs of the enterprise

(Training needs noticed within the enterprise during last years. Supplementary suggestions for training)

Training offer in this sector is quite wide. Nevertheless it represents a critical point not already faced suitably by training structures. Integrated Environmental Management System to be implemented adequately within a structure must consider a work of equip. Therefore the Responsible of Environmental Management System should be able to make himself guarantor of the solution of the team contrasts. Training structures deputed to the preparation of this profile will have then to take care of the relational and interdisciplinary aspect of this figure.
Besides, in regard to training stages, it would be desirable its insertion in different productive typologies. The spectrum of risks is in fact quite changeable depending from what enterprise activities are.

7.1.10 Market needs of experts on integrated safety, quality, environment Management and background requested

The main skills of an expert of Environment, Quality, and Safety Management are flexibility, problem solving and technical competence.
An enterprise is embedded in a social context articulated in sub-systems like:

- Political-institutional context;
- Economic context and relevant markets conditions;
- Social and cultural context;
- Ecological-natural context.

In the Eighties, Environmental Managers attended to specific sectors (water, air, waste, safety) and were charged to solve technological problems concerning specific productive processes. There has been later the substitution of specialised professional technician with managers characterised by wild interdisciplinary knowledge. Their competencies have been extended to the whole environmental problems of the enterprise. The Eco-manager, in particular, usually holds the responsibility to formulate and propose guidelines of environmental Policy. He has to take Regulation under control and guarantee its respect. He should be able to co-ordinate personnel training-information activities. He has to take care of external communication relative to environment. He will finally check and value the results of internal environmental Policy. His real duties are very diversified. The ones more frequently carried out by the Eco-manager are related to: control of norms evolutions, relationship with the external and technical duties of emissions reductions.
Within enterprises, in 90% of cases there exists a clear Eco-manager profile and in 80% of cases there exists a specific environmental function. This function, in the organisation chart, is normally placed in the „personnel functions“ (32,5%), in „technical functions“ (17,5%) or in production (12,5%). Such profile could be formed starting from a scientific post-graduate knowledge. It is necessary to have a good knowledge of English and informative systems. Furthermore a strong propensity to working in a group is required. The success of a training activity depends on training experts’ skill to reproduce in a class the socio-economic context in which the Eco-manager has to work. For example the institutional and juridical context should be illustrated by the actors involved in the protection of the environment (Regions,

Municipality, Province, AUSL, ARPA, ANPA, TAR). Practical experience, to make effective theoretic information, should be scheduled during the theoretic modules and not at the end.
The macro-modules suggested for a master's programme aim to engage the student in interdisciplinary analysis of an enterprise problems in the field of environment, quality and safety. The modules could be organised as follows:

- Company organisation;
- Auto-analysis and motivational process;
- Regulation on Quality System;
- Quality hand-book;
- The system of quality audit;
- Introductions to regulation regarding Environmental management –systems for the environment;
- Legislative view;
- Environmental analysis (check-up);
- Eco-auditor;
- Regulation concerning safety;
- Techniques of communication and management of a staff;
- Risk Analysis;
- Introductions to regulation dealing with company management systems for safety;
- Energy manager;
- Evaluation of environmental impact of an enterprise;
- Unique Model of Environmental Declaration (MUD);
- Computer;
- Environmental Budget (costs reportings);
- Technical English;
- STAGE;
- Feed-back of the training;
- Final examination.

Summary

SMEs are often behind in comparison to big companies because of lack of human, financial and technical Resources. The Elite Ambiente case study, on the contrary, has demonstrated that a SME can exploit Emas benefits and advantages.
Emas has contributed significantly to improve its organisation.
SGA implementation has given to the enterprise the opportunity to redesign its organisation chart.
The goals achieved were particularly:

- the optimisation of the structure;
- the improvement of the staff efficiency, also towards its training;
- the study of new procedures of intervention;
- the reduction of the costs connected to the optimisation of the organisation chart.

7.2 Case study from Austria[79]

Sequi in a medium-sized service enterprise

CSI (Centre for Social Innovation) chose the Austrian firm **Johann Rohrer Ltd** for the case study, as it is a company which has integrated two management systems, namely safety and quality. The interview was carried out with Walter Brandl, the manager of the Austrian establishment and confidential clerk of the firm. He is also responsible for the integrated management system (IMS).

7.2.1 Description of the firm

Johann Rohrer Ltd is a service enterprise which offers industrial environmental-friendly cleaning, coating and insulating processes for certain industrial constructions, e.g. heat exchange tubes, scaffolds, hanging stages, oil tanks etc.. for more than 20 years.
Address of the Austrian establishment:

Johann Rohrer GmbH
Südrandstraße, Baulager Ost
A-2320 Schwechat-Mannswörth
Tel.: ++43 1 707 32 82
Fax: ++ 43 1 707 32 824
E-mail: rohrer.wien@aon.at
Url: http://www.rohrer-int.com/

Moreover, Johann Rohrer has establishments in Styria (Austria), Rheinzabern (Germany), Rockanje (Netherlands) and Texas (USA).

Guidelines of the enterprise

The firm Johann Rohrer follows the guidelines below:

- to beat the standard, not meet the standard
- closed containment rinsing process
- compliance with OSHA 1910.199 safety regulations
- meet customer safety requirements
- strict anti-drug and alcohol policy
- innovative expertise/ultra low HC-vapour emission
- personnel trained in accident prevention
- negligible hazard potential
- residual HC-recovery is processed in closed circuits
- professional supervision
- environmental protection
- permanent monitoring of HC-vapour emission

Description of the employees

The Austrian establishments employ 100 people, the German establishment 25, the Dutch establishment 15 and 6 employees work in the American establishment in Texas. Employees

79 by Maria Schwarz-Wölzl, CSI

who work abroad are trained in Austria. This means that they have the same educational background as their Austrian colleagues.
10 to 15% of the Austrian employees went to high school and 85 to 90% are trained or unskilled workers.

7.2.2 The Integrated Management System (IMS)

In Austria there are rarely any SMEs which integrate the three areas of safety, quality and environment into one management system. Only a few companies which integrated two of these three management systems, were found.
The firm Johann Rohrer integrated two management systems: safety and quality. It, however, chose an unusual way for the system certification.
At the beginning of the 90's enterprises in Austria started to have quality management certified, nowadays also environmental management. The certification of safety management is not really a topic in Austria. There are only about 15 enterprises in Austria which have a certification in the field of employment safety.
The firm Johann Rohrer, however, integrated a quality management system in an existing safety management system:

- 1994 certification of the safety management according to SCC[80]
- 1995 certification of the quality management according to ISO 9002

7.2.2.1 Safety Management

As mentioned above, the firm Johann Rohrer has an establishment in the Netherlands. Therefore it has customers in the Dutch area. According to Mr. Brandl, compared with e.g. Austria people in the Netherlands are more aware of the importance to take measures which reduce the risk of an accident. In the Netherlands there are rarely any enterprises which are not certified in the safety area. It is nearly impossible to get any orders, or even apply for an order, if you have no safety certification.
In order to keep its Dutch customers, the firm Rohrer had to acquire a safety certification. The management chose SCC for their certification which was done in 1994.
The introduction of the SCC certification procedure had four main advantages:

- Structuring of the organising procedures.
- The SCC certification was the basis for the implementation of the quality management system.
- It opened new chances on the market, in the Dutch area the firm Johann Rohrer was competitive.
- The qualifications of the employees were improved. All employees had to attend a basic training course on safety questions, even employees who had nothing to do with this topic.

The SCC implementation and certification was done by a Dutch consulting company.

7.2.2.2 Quality management

As the firm Johann Rohrer is active in four countries, it encounters different kinds of customers' requests. Besides that, large distances have to be overcome. In order to keep or

80 The SCC (Safety Certificate Contractors) was developed by the petro-chemical industry in the Netherlands. It includes standards of safety, health and environment which are checked by a question catalogue. An independent person checks the observance of the standards.

improve their position on the market, it was necessary to reform the communication process and structure of organisation. For that reason Johann Rohrer decided to certify the quality management according to ISO 9002 which was done in 1995 by an Austrian consulting company.

7.2.2.3 Environmental management

In environmental management the firm Johann Rohrer has no certification. Nevertheless it takes environmental aspects into consideration. SCC includes environmental standards. The firm Johann Rohrer also takes part in projects which deal with environmental questions (e.g. participation in the project „Methods for cleaning oil tanks causing little emissions„ together with the Montanuniversität Leoben). Furthermore the firm Johann Rohrer is a member of different German environmental workshops.
The Austrian establishment employs an internal environmental expert and an expert for dangerous goods.

7.2.3 Integration process of SCC and ISO 9002

In principle the procedures of safety and quality management systems are analogous to each other. They, however, focus on different target groups. The quality management concentrates on the customer, the safety management on the employees.
For three years different handbooks were used for each management task. In the course of 1998, due to the recertification of both systems, the management decided to unite both management systems. The aim was to combine singular functional „island solutions“ to an integral concept which covers all areas of the enterprise, but allows a „thin“ management. The combination of the two management systems took three years. Handbooks had to be newly written and instructions for procedures had to be newly defined. Besides, the implementation of an environmental management system in the integrated system should have been easily possible.
It, however, turned out to be difficult to find a company in Austria which was allowed to certify more than one management systems with one audit. The firm Johann Rohrer was not willing to pay for the cost of two audits. It successfully applied to the company which certified their quality management for acquiring also the competence for a SCC certification.
Mr. Brandl stated that accredited certification companies and consulting companies tend to develop their services into an IMS only because of pressure from the market.

7.2.3.1 Description of the integrated manager

Mr. Brandl is responsible for the management of the Austrian establishment, and he is also the head of the IMS. He has the following educational and professional background.

- Successful graduation from high school
- An internal enterprise training program for three years, in order to become the manager of the Austrian establishment
- Attendance of advanced training programs in order to obtain knowledge of the SCC management
- Attendance of a training course for an internal auditor at WIFI Styria. This education authorised him to implement ISO 9002.

According to Mr. Brandl the successful implementation of the IMS and acceptance of the system by the employees is due to his personal specific knowledge of the trade. Without detailed knowledge of the daily requirements and problems of the employees, it would not have been possible for him to be in such a successful position.

7.2.3.2 Architecture of the integrated management

The Austrian establishments of the firm Johann Rohrer employ 100 people. The top of the firm is the conduct of business which supported the implementation of the IMS.
Mr. Brandl acts on the second management level as responsible manager of the IMS. Two safety officers, two confidential persons for safety and one labour physician are in charge of the preventive services as required by law. Besides them, there are employees with environmental responsibility and Mr. Brandl's assistant.
In regular meetings matters concerning the IMS are discussed and further developed.

1.Level: Meetings of the conduct of business with the management of the different establishments, twice a year.
2.Level: Meetings with the management of each establishment, project managers, safety officers, confidential persons for safety and labour physicians, four times a year.
Content: Disorders/incidents, accidents, training courses, education, development of projects, etc.
3.Level: Meetings of the employees with the management of each establishment and selected employees, but without the project management, four times a year.
Content SHWE (safety, health, well-being and environment)

The way Mr. Brandl manages the IMS can be called a bottom-up operations style. He always tries to involve the employees in the managing process and make the procedures transparent for them. In his opinion he was very successful with this method.

7.2.4 Expectations on a future qualification concept for an integrated management system

According to Mr. Brandl the training program for the internal quality management auditor at WIFI Styria was a little bit too theoretical. The training program empowered him to audit the quality management, however, he was not able to manage quality processes.
The same holds true for the training of the safety officer. The training program aims at the checking of the safety norms, but ordinary safety problems are not pointed out (e.g. „cable salad").
For that reason, Mr. Brandl appreciates further education on the job. However, only employees, who have practical experience and a good knowledge of the industry should attend an advanced training course.
Generally he stated that future concepts should contain specific as overlapping questions of different areas as well. The training of social skills should also be included in the training program as well as the ability to make use of the legal regulations taught in the course.

7.2.5 Summary

The following conclusions can be drawn for the SEQUI project from the case study:

- There is demand for integrated management systems.

- Accredited certification companies and consulting companies have to prepare themselves to be able to certify more than just one management system.
- The employees should be involved in the process of management integration in order to make sure that the employees will accept the integrated management system.
- After the implementation of an IMS, regular meetings should take place. This makes the management aware of certain problems.
- Advanced training for experienced employees with practical placements are more useful than one training course without reference to practical work.
- The advanced training should include the training of social skills

7.3 Case studies from France[81]

7.3.1 QSE profile in the mineral industry sector

7.3.1.1 Context and problematic :

The European production of aggregate is about two billion tons which represents about ten thousand companies. The average consummation of aggregate per inhabitant per year is around six tons. For example, the construction of one kilometre of motorway needs about thirty five thousand tons of aggregate. Otherwise, aggregate is very present in the construction industry and artworks where it represents about ninety percent of the composition of concrete.
Each production site is like a small business, employing no more than 20/30 people. Nevertheless this necessitates the installation of heavy production machinery (handling and transport, crushing and sifting) bringing into play powerful elements leading to significant problems in the area of personnel safety (the building and public works sector has the highest incidence of work-related deaths).
This industry also exploits a natural resource and processes it in installations that are polluting (noise, dust, the visual aspect of the site during and after exploitation : problems of restoration) and that produce waste (unsellable products, used machine parts, used oil, etc…). The environmental problems and constraints are therefore significant.
It must be noted at this level the close link that exists between the notion of safety and of environment : in fact noise and dust are agents which attack the personnel and can often lead to serious work related diseases (deafness, silicosis).
Finally, it should be emphasised that the products need to respond to the growing expectations of the clients in terms of quality : one can list, for example, ballast for high-speed trains and high performance concrete for art works. There exist close links between the notions of quality and of environment, in particular in relation to the recycling of demolition material. In fact, before being re-used they absolutely need to meet the requirements of their new use.
It is obvious then that the fundamental needs of this industrial sector are very much related to Q.S.E. management.
In the following paragraph, we will present a case study which describes the present situation. In other words, it describes the way in which Q.S.E. management is treated by these companies. This analysis as based on a survey of industrials in this field.

Case study:

The following remarks present the way problems related to Quality, Safety, and the Environment are treated in the mineral industry. These remarks are a synthesis of a survey of industrialists in this field.

81 by Francoise Leclercq, CRCI

Conditions:

Q.S.E. functions are generally ensured by three distinct persons :

- the lab worker, charged with the quality analysis of the products. This is generally a full-time position. One should note that this necessitates close collaboration with the clients.
- The safety chief who is generally not a full-time position. This function is generally assumed by the site manager.
- The environment chief who generally goes by the title of 'responsible for property/land and the environment'. His function necessitates numerous contacts with various administrations, residents and local officials.

The tools which these people use are principally : legislative texts, norms and internal procedures.
Therefore Q.S.E. managers as such don't really exist. Instead there is a group of people responsible for the functions Q+S+E.
The necessity to regroup these functions has nevertheless been emphasised by the industrialists surveyed, who insist on the necessity to embark on global projects within the frameworks of the ISO 9000, 14000 and 18000.

The desired basic training :

The desired training by a Q.S.E. manager is basically a technical one. It should then be completed by more specific notions in relation to problems on quality, safety and the environment. The Q.S.E. manager also needs to be able to refer to specialists in the case of particular problems (e.g. legal problems).
In relation to the hierarchy of the company, the Q.S.E. manager should immediately refer problems encountered to the management of the company or the production site.

Other remarks

Two important remarks need to be stressed:
- The Q.S.E. approach is an undeniable commercial argument but it is very difficult to transfer the cost of this onto the selling price of the product.
- In the case where a Q.S.E. management function would be created (integration of the three aspects of the problem), it may not justify the creation of a full-time position in the smallest companies. The solution of sharing a part-time position between several companies brings up the question of competition and confidentiality.

7.3.1.2 Summary:

In the first paragraph we have shown that the mineral industry is really in need of a Q.S.E. management program.
To this day, however, the problems related to Quality, Safety, and the Environment seem to be treated separately even though the necessity in approaching them in an integrated way is making itself felt.
The principle impeachment to this integration seem to be :
- economic factors (return on the investment of creating this type of position),
- unsatisfactory (or unknown) needs of the industrialists in terms of professional profile.

7.3.2 QSE profile in the ports

7.3.2.1 The context of the case study :

Ports and the companies involved in this facility are particularly confronted with problems linked to the environment and its protection. This is due to the location of ports (coasts or estuaries, proximity to or integration in towns) and the diversity of the activities happening in and around them (transport of goods by road, rail and sea, warehousing, conversion).
The prevention and management of risks is essential in this context and necessitates :

- a watchful eye on the evolution of the regulations and expectations of the relevant administrations,
- a respect of the established norms, conventions and rules,
- a management of the relation with the local residents often affected by pollutants (noise, dust…) and with the ecologists, critical of the risks the evolution of an industrial site poses to the ecological balance of an estuary or harbour,
- a management of the relation with local organisations in terms of preventing direct industrial or environmental risks.,
- communication with all the parties intervening or implicated in the various activities in and around a port.
- an anticipation in terms of the development of new skills to deal with these issues.

Finally, one mustn't forget that access to land to create new silos, a rationalised stockage property management and the relevant programs of quality are important consideration in the positioning of forwarding agents and all those whose activities revolve around the port.
The very specific expectations of these fields should lead these companies to define the orientations of an integrated Quality, Safety and Environment (Q.S.E.) strategy and consequently an anticipation of the development of new skills to deal with it.
This is the case of MTTM whose organisation we will describe through the contribution of Fabienne GERMAIN, gathered on the 09/11/99 by Françoise LECLERCQ (Chamber of commerce and industry partner of SEQUI).

7.3.2.2 General information concerning MTTM :

MTTM – handling, transport, transit, warehousing.
MTTM looks after everything which concerns the loading and unloading of cargo (cement, cereals, animal feed..), storage and the bulk expedition to their destination (20000 m² storage capacity - 11 warehouses including 1 vertical silo of 10000 tons specialised in the export of cereals, 1 flat silo of 50000 tons specialised in the agro-food sector, 2 flat silos of 40000 tons specialised in cement. The different sites and silos are distributed among the ports of St. Nazaire, Montoir and Donges. 25 transport and handling systems which are part of MTTM's own equipment).
Year founded : 1919
MTTM is the mother company with 40 employees. It is part of a larger group of 100 people. Turnover for the year 1998 was 90 million French francs for MTTM and 116 for the group.
The level of education of the personnel of MTTM is as follows : primary school 20%, secondary70%, and university10%.
Contact : Fabienne GERMAIN,

Function at the time of interview : head of the Property/ Safety / Environment dept.
Tel. 33 (0)2 40 90 08 09
E-mail : fabiennegermain@mttm.com

7.3.2.3 A new professional profile at MTTM

(After an interview with the journal ENVIRONMENT –n° 1573 – December/ January 1999)

'The captain who liked to take risks'

'For me, risk prevention programming seems natural'. And luckily, because at 34, Fabienne Germain is the new head of new projects and consequently of safety and the environment at MTTM, a Nantes logistics company. There was nothing in her life which would have predicted this outcome. Passionate about scuba diving and alpine skiing, she was always on the move. At 22, she went to Tibet on a horse-riding expedition. Her engineering studies led her to become captain 1st class on a France Telecom cable laying ship, where she worked in numerous different jobs, including safety officer. For 7 years she was in charge of accident prevention on board and the training of prevention teams. Between sailings she achieved her Mba at the higher business institute.
Eventually she took a break of a few years to look after her second and then third child.
Once again active, Fabienne Germain didn't rest her laurels. In a few months she launched the conformity of the bulk-food warehouse and built holding drums for oils around new installations. Under her directive the storage blocks benefited from an anti-explosion surveillance system. Finally, conforming the warehouse was finished. This ex-sailor certainly doesn't lack ideas. She has just finished a study on waste for her company. What will be next ?

7.3.2.4 Personnel in charge of QSE management :

MTTM is at present in the process of expanding. Important investments have been made in property with the creation of silos and new storage sites. In this context the company has passed through different stages which have contributed to the evolution and to the search for new skills.
The first step was Quality- two sites obtained ISO certification.
Then the process of conformity necessitated the setting up of a structured program and a strategic layout of orientations. Within this framework the company had to deal with two types of regulations :

- employee safety in terms of the work code,
- site safety according to the ICPE (classified installation for environmental protection) regulations.

There now remains the development of systematic audits of all the sites.
To deal with these developments, Fabienne Germain was hired two years ago, given the mission 'safety, environment'. Recently the creation of the 'property, safety, environment' dept. was handed to her. In this sense she deals with the negotiations and construction of new silo projects, as well as the coordination and management of the floor space and the responsibility for property acquisitions.
She deals with the management of the three fields Safety, Quality and Environment in direct consultation with top management. She also has significant negotiating responsibilities in relation to the environment question (Industry minister for the classified sites, Town Hall, Ecological organisations…)

Regarding direct quality control, each site manager ensures his/her own activity with the cross-disciplinary co-ordination from Fabienne Germain.
A technician on a 6-month contract had to be hired in relation to the setting up of safety protocols in the different sites and silos spread among the ports of St. Nazaire, Montoir and Donges. The technician could, after spreading his time between different small companies.
By the way, according to its needs, MTTM also calls on the expertise of outside consultants, for example, for the setting up of a safety protocol allowing for the management of the flow of loading and unloading for MTTM and the flow of the port.

7.3.2.5 The professional profiles and tools for the integration of safety, environment and quality :

The profiles and basic skills essential for these new collaborators are :
For the strategic position, a double profile with A-levels + seven years further study.

- Merchant navy engineer = technical culture, a capacity in risk management, management of technical teams.
- Mba : management, knowledge of law and introduction to a complex environment.

Directly connected with the top management, Fabienne Germain is in a position to negotiate effectively with the administration and environmental agents : Mine engineers, Polytechnicians.
For the technical position (to be created contractually for a duration of 6 months), one must select a person with A-levels + 2-3 years study with specific technical skills in the fields of quality, safety and environment and relational and organisational capacities.
To deal with these Quality, Safety and Environment activities, the company :

- is subscribed to 'Editions Legislatives' (legal journal) with monthly updates of CD ROM's supplied in this framework (CD ROM on safety and work conditions, environment and pollution),
- consults the civil code, and whenever necessary, a law firm which invoices their services,
- uses the Internet and its specific sites.

7.4 Conclusion of the professional profiles highlighted in the case studies

The **Italian** partners focused their attention on **Elite Ambiente srl,** a service undertaking that operates in the ecological field. Elite Ambiente is an example of a very modern Small and Medium Enterprise already certified with EMAS. CRA Montecatini has considered it as a perfect case study to learn what are the most suitable Sequi profiles for Italian medium dimensions.
Elite declared to have only one person in the company who deals in a complex way with Environment, Quality and Safety and confirms the opportunity to create a Sequi Manager. When asked to evaluate the Italian training offer in the field, the company underlined that even if the panorama is quite large the weak point of the system is that institutions have difficulties in taking care of the relational and interdisciplinary aspect of this figure. Besides, training stages and practical discussions are rarely efficient to ensure that the Sequi expert acquires the first skill of flexibility, problem solving and technical competence.
Andrea Contarino, the person interviewed for this case study suggested a list of topics which shouldn't be held back in the training of „Sequi" experts. These topics are:

- Company organisation,
- Auto-analysis and motivational process,
- Regulation of Quality System,
- Quality hand-book,
- The system of quality audit,
- Introduction to regulations regarding environmental management systems,
- Legislative view,
- Environmental analysis (check-up),
- Eco-auditor,
- Regulations concerning safety,
- Techniques of communication and management of staff,
- Risk analysis,
- Introduction to regulations dealing with company management systems for safety,
- Energy manager,
- Evaluation of the environmental impact of an enterprise,
- Unique Model of Environmental Declaration (MUD),
- Computer,
- Environmental Budget (costs reporting),
- Technical English,
- Stage,
- Feedback from the training,
- Final examination.

The **Austrian** partners at CSI chose as a case study a service enterprise **Johann Rohrer Ltd** which offers industrial environmental friendly cleaning, coating and insulating processes for more than 20 years. In Austria there are rarely any SME's which integrate the three areas safety, quality and environment into one management system. The firm Johann Rohrer integrated two management systems: safety and quality. The company is one of the few in Austria which possesses a safety certificate, and for this reason is an innovative SME. Also, this company gives impetus to certification bodies and consulting firms for synchronised audits and consulting concepts respectively. This situation provides an important hint to the

question - who sets the trend regarding Sequi: the enterprises, consulting firms or other organisations in SME surroundings. The Austrian survey shows that it is rather the internationally active SME's which innovatively determine the training, certification and consulting market with regard to SEQ integration. Also, the firm Rohrer practices beside the top-down management strategy a bottom-up management strategy, which is described as successful business politics.
Regarding the expectations on a future qualification concept for an integrated management system, the interviewee stated that further education on the job is certainly appreciated, above all if not too theoretical and when employees already have practical experience and a good knowledge of the industry. The training of social skills should also be included in the training program as well as the ability to make use of the legal regulations taught in the course. The Sequi manager of the firm Rohrer is in favour of a project oriented training in stages.

The **French c**ase studies in the **a.) mineral industry sector** show that Q.S.E. functions are generally ensured by three distinct persons:

- the lab worker, charged with the quality analysis of the products. This is generally a full-time position. One should note that this necessitates close collaboration with the clients.
- The safety chief who is generally not a full-time position. This function is generally assumed by the site manager.
- The environment chief who generally goes by the title of 'responsible for property/land and the environment'. His function necessitates numerous contacts with various administrations, residents and local officials.

The tools which these persons use are principally : legislative texts, norms and internal procedures. Therefore Q.S.E. managers as such don't really exist. Instead there is a group of people responsible for the functions Q+S+E.
The desired training by a Q.S.E. manager is basically a technical one. It should then be completed with more specific notions in relation to problems in quality, safety and environment. The Q.S.E. manager also must be able to refer to specialists in the case of particular problems (e.g. legal problems).
In relation to the hierarchy of the company, the Q.S.E. manager should immediately refer problems encountered to the management of the company or the production site.

The second French case study of the **b.) firm MTTM in ports** aids in finding the profiles and basic skills essential for these new collaborators:
For the strategic position, a double profile with A-levels + seven years further study.

- Merchant navy engineer = technical culture, a capacity in risk management, management of technical teams.
- Mba: management, knowledge of law, and introduction to a complex environment

Final considerations of the professional profiles shown by the case studies in SME's:

The case studies that will be examined had the purpose of diagnosing the modalities and characteristics of the transitions happening in the field of safety, quality and environment. In general terms we can state that for companies with a leading role in their field, the push towards Sequi implementation was given by the organisational factors but without being conscious of it.
In fact even if the ability to analyse the critical points of the productive system in a company is quite developed, managers usually don't have the same abilities to diagnose the critical points of safety, quality environmental problems e.g. the reactions of workers towards safety problems or some bad modalities of protection.

First of all the demand for integrated management system exists.
The management is certainly much more concerned with the harder variables of the integrated management of safety, environment and quality than the softer one.
The results, which emerged from the diagnostic part of the research and later on from the case studies, confirmed the importance of having external actors who are able to catalyse the implementation of change processes in the company.
However, certification bodies as well as consulting firms must contribute to the trend towards the integration of the three management systems and adapt their offers with regard to Sequi. The enterprises which are clearly identified as impulse givers to Sequi in the analysis are not willing at all to accept an own audit or consulting offer for each management system.

The main skills of an expert of environment, quality and safety management are

- flexibility
- problem solving
- technical competence
- social competence
- juridical competence

8 Case studies of training profile

The objective of the case studies of SEQUI training profiles was to obtain a basis for later curricula drafts. Different training offers were taken into consideration:
Italy carry out – as arranged – no case study.
Austria carried out a.) a case study of a Sequi training program which is targeted at graduates looking for jobs and b.) a post-graduate further training course, carried out at the Donauuniversität Krems.
From **France**, one training program was available. The initial training is based on the A-level or 5 years equivalent work experience and is targeted at young engineers, job seekers, etc.

The guide contained the following questions:

General information about the institute (request for documents)

- *brief description of company (when founded, description of activities, etc)*
- *What training programs are offered?*
- *Duration of courses*
- *Expenses*
- *Minimum/maximum number of course participants*

General questions about the courses

- *What qualification does one obtain with the various courses?*
- *How are the courses organised, theoretically and practical?*
- *Who conducts the courses? What training do the course lecturers have?*
- *Are there pre and post evaluation for the courses?*
- *How satisfied are the course participants with the training?*
- *How satisfied are the companies with the training offered?*
- *Did the companies express their interest for such a training program?*
- *Are there similar projects in other European countries?*
- *What do you personally think of the combination of these three occupation fields?*
- *Are there any feedback about how the participants do in practice?*
- *Will this training program still be offered? Feedback?*
- *How good are the chances in getting a job in the trained area (job placement quota)?*
- *For which type of companies/institutions is this new occupation field interesting?*
- *What legal steps have become necessary for the combination of these three occupation fields?*
- *Contents of the courses / organisation (basic training in management systems, process management and consulting competence)*
- *Module system (concrete job-related further training) versus training (e.g. college)*
- *Training for the internal „SEQUI manager“ or external consultant?*

8.1 Case study from Austria[82]

8.1.1 An Experience Oriented Course for Graduates in Employee Safety and Environment, Quality and Total Quality Management

FACTUM chose the consulting firm Gutwinski as the first case study in the SEQUI framework. The interview was carried out with the Managing Director's assistant, Frau Mag. Donninger.
Gutwinski Environmental Management was founded in 1991. Initially, Gutwinski concentrated on the training of waste management representatives. Today, Gutwinski is a consulting company concentrating on environmental management systems with 13 employees and several self-employed experts. In addition to external consulting, they offer training courses for environmental representatives, ecological audit mangers and waste management representatives as well as further training courses in the fields of responsibility for safety measures and safety specialists.

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8.1.1.1 Why Gutwinski for the case study?

Gutwinski is particularly interesting for the SEQUI project as they offered a course within the framework of the EU project „EVAS" – Women in EnVironment And Safety. This was the first course to combine safety, environmental and quality management in one training programme. No other similar courses in any other European countries are known.

The EU project was encompassed in the framework of the employment programme Employment NOW (new opportunities for women). The EU project was initiated by Gutwinski which submitted their project idea to the European Social Fund. According to Mag. Doninger, the idea for the project came from companies which constantly asked if an integrated training course for all three fields could be offered.

An Experience Oriented Course for Graduates in Employee Safety, Environmental; Quality and Total Quality Management

The experience oriented course for graduates in employee safety, environmental, quality and total quality management was, as mentioned, organised by Gutwinski and sponsored with funds from the Lower Austria Employment Service and the European Social Fund. GIP (The Office for EU Joint Initiatives and Programmes) administered and supported the programme on the EU side.

Course description
Duration: The course „An Experience Oriented Course for Graduates in Employee Safety, Environmental; Quality and Total Quality Management" took place between July 1st 1998

82 by Karin Ausserer &Clemens Kaufmann, FACTUM

and June 30th 1999. The course consisted of a 6-month theoretical component (around 40 hours a week) and a 6-month practical placement in companies in Lower Austria and Vienna.
Cost: Mag. Doninger could not give any information about the actual cost of the training course. The course fees were anyway assumed by the Employment Service and the European Social Fund. Course participants had the right to claim financial assistance to cover living costs.

Target group: entry requirements for the course were
- students should be female
- a degree from either the Technical University or the Agricultural University or in law, social sciences or economics
- Basic computer knowledge (Word/Excel).

Students who had broken off their studies after completing the first section of a degree course were also entitled to attend the course.
18 women in total, with varying qualifications, took part in the course. Participants without any previous technical knowledge had to take an aptitude test for safety specialists.

Course content:
According to Mag. Doninger, the training programme was tightly packed and covered the following areas:
- Project management, personal organisation and time management
- Employee safety – training to be a safety specialist in accordance with BGBl. 277/1995, carrying out evaluations
- Waste economics – training to be a waste management representative in accordance with the recommendations of the Ministry for the Environment
- Environment – training to be a environmental specialist: environmental management, environmental law and the technical and scientific basics of environmental protection
- Quality management – training to be a quality manager, quality management according to the ISO 9000 series, creating, auditing and certifying quality management systems, Total Quality Management
- Experience in company business management
- A six-month practical project in a company
- Applications and founding advisory services
- First aid course (16 hours)
- Training to be a Fire Safety Officer
- Internet and data processing training
- Imparting basic knowledge in communication and mediation techniques

The training in each area was carried out by whichever institution was authorised to be able to do so, as a result there were no additional legal requirements in order to combine these jobs.

AUVA (Allgemeine Unfall- und Versicherungsanstalt) was responsible for the safety specialist and fire safety officer training.

TÜV Bayern Landesgesellschaft Österreich took on the field of quality management

Gutwinski taught in the fields of environment and waste

Roland Gares Consulting taught project management and company business management

The Red Cross carried out the First Aid course and

A communications scientist gave an insight into communication and mediation techniques.

The theoretical course was organised in modules. The communications scientist was present on the first three days and she steered the group dynamics. The first module was concerned with the basics of management systems. Thereafter, the other areas were taught alternatively, building upon this initial knowledge. This alternation was necessary as certain areas, for example the theoretical part of training to be a safety specialist, was too theoretical to be taught in one stretch. After each module was finished, an exam was held and a project written.

Even in the theoretical part of the training, an attempt was made to relate to practice. The students went on field trips and people already working in the relevant fields were invited in for discussions.

8.1.1.2 The practical placement

After the theoretical training was completed the course participants were placed in companies throughout Lower Austria and Vienna to put their theoretical knowledge into practice. As Gutwinski keeps very good contacts with different companies, this placement was easy. The companies incurred no costs by taking on these trainees.
However, Mag. Doninger mentioned that in practice, the course participants were met with a certain scepticism. On the one hand, prejudices were inevitable as women venture into the technical field, on the other hand employees in the fields of quality, safety and environment were worried that their jobs were in danger. In principle, the integration in the work force went very well. It must however be mentioned that none of the participants were employed where they were responsible for all three fields. Rather, they were given a main area of employment and allowed a glimpse into the other fields.

8.1.1.3 Conclusion of the course

Completion of the full training programme led the participants to a certificate as:

- Safety specialist
- Quality manager
- Waste management representative
- Environmental
- Fire safety officer

In addition, Gutwinski presented a general diploma for the successful completion of the whole course. This is to say that the usual certificates for the individual jobs were issued but not a new certificate for a new profession.
Participants who wanted to become self-employed had, in addition, the possibility to acquire a trading license.

8.1.1.4 Experiences and first results from the Gutwinsky pilot project

With regard to the employment programme, the project was extremely successful. None of the participants dropped out and all found a job upon completion of the training.

With regard to the course, the following can be recorded. For this project there was no pre-evaluation, that is neither the participants nor the companies were asked about their opinions of the new job profile before the pilot project. At the time of the interviews, a questionnaire (post-evaluation) for the participants and companies was being worked upon.

The participants have already given their first comments to the Lower Austria Employment service and Gutwinski has carried out initial discussions with the companies. According to the management, the first feedback is very positive.

For the SEQUI Project it is interesting that none of those who completed the course are working as SEQUI Managers, but are employed in only one of the three fields. According to the interviewees, the new job profile of the SEQUI Manager must first be accepted in Austria. The Austrian market is, however, not ready for it. Companies fear a new set of written regulations that must be kept to. However, in order to stay competitive, they will have to incorporate this new job profile sooner or later.

For which industries is this integrated training relevant?

This training is relevant for all fields. However, the SEQUI Manager is best of all suited to medium-sized companies. In some medium-sized companies the fields of environment and quality are already successfully integrated into a single job description. But it is also a question of costs. Training to be a SEQUI Manager is expensive and difficult for medium-sized companies to finance. Should the course programme be taken on by other institutions, it would be important to tailor the contents of the training to the respective target group.

8.1.1.5 The module system versus college

According to the interviewees, pure university education would not be useful in this sector. First of all, the course was very practice oriented which would not be the case in a university education and for this type of job, relevance to practice is necessary. In addition, universities always trail behind the market. Universities do not have the necessary contacts to companies so that the students who finish the course can also find jobs.

8.1.1.6 External consulting versus internal „SEQUI manager“

The trend is moving more and more towards „outsourcing“. The new job will most likely be more successful when performed as external consulting.

8.1.1.7 What does this mean for SEQUI? – Summary

From the case study, the following conclusions can be drawn for the SEQUI project:

- The demand for SEQUI Managers is there, even if the market must first be prepared.
- A SEQUI manager is interesting for all branches of industry. In Austria, however, it is best suited to medium-sized companies.
- The contents of the training course must be tailored to the respective target group.
- The training course must be extremely practice oriented, a university type training has only limited appeal.
- After the training course the students can work as an external or internal SEQUI Manager. Generally, however, the trend is moving towards external consulting.

8.1.2 „Quality Management“ course at the Donau University, Krems

The course „Quality Management Quality, Environment, Safety“ was chosen as the second case study in the framework of SEQUI. The interview was carried out with the course leader, Herr Univ. Doz. DI Dr. Franz J. Brunner Dir.I.R.

8.1.2.1 The Donau University Krems

The Donau University Krems (University Centre for Further Education) was founded in April 1994. The range of courses came from the dynamic developments in the different fields and new demands made on contemporary training as a result of these developments. The courses therefore correspond with the international demand for theoretical and practical knowledge. In order to provide qualified training, people were invited from companies and institutions, both from inland and abroad, to teach alongside lecturers from other universities. The Donau University Krems is a pure postgraduate university and, as such, the only one in Austria. The courses range from Telematic Management to Technical Documentation to Solar Technology.

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Lehrgangsleitung: Univ.-Doz. DI Dr. Franz J. Brunner
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www.donau-uni.ac.at

8.1.2.2 The course „Quality Management“

This course is a postgraduate course which lasts three terms. It is considered a course which can be studied alongside a regular job; persons already working in a company are able to attend the course. The course consists of nine modules. The course resulted from the demand for qualified workers who are competent not only in the fields of Environment and Safety but also in the field of Quality. Such persons are, above all, an advantage for small and medium-sized companies. The costs for the whole course amount to 120.000 Schillings. It is the first course of this type at the Donau University Krems therefore no information about the success of the course was available.

The target group
The course was aimed at the following target groups:
- As an additional qualification for young academics
- Persons responsible for processes and projects
- Executives and executives-to-be
- Engineering specialists aiming to achieve a level suitable for Europe

8.1.2.3 Sequence of course components and guidelines of the course

The course lasts 11/2 years and consists of nine modules. Each of these modules is dealt with in a 14-day course. In addition to the modules, workshops are held and seminar papers written. Out of consideration for the participants who are still working while doing the course, there is a pause of 4-8 weeks between each module to allow them to fulfil their professional

commitments. The course concluded with the writing of a so-called Master Thesis in a company followed by an exam.
The course was created according to the following guidelines

- The „harmonised scheme“ of the European Organisation of Quality (EOQ) for the qualification of a European Quality Manager.
- E.F.Q.M.- Model for Business Excellence of the European Quality Award (EQA)
- The new international Quality Management guidelines ISO 9000-2000
- KAIZAN – the Japanese principle of continual improvement

8.1.2.4 The individual modules

According to Dr. Brunner, the module system is ideally suited to postgraduate studies. This has already been proven to be the case in American universities. It allows course participants who are already employed to continue with their jobs. The individual modules can also be studied separately. (Cost per module: 15.000 ATS)
The following is a short description of the content of the **nine** modules:

Module 1: The Basic Principles of Total Quality Management
- Concepts, Strategies, Planning and Organisation in TQM
- Quality Management Systems
- Statistical Methods and Problem Solving Techniques
- Basic Principles of Test and Measurement Technology
- Quality Information and Documentation Systems
- Communications Technology

Module 2: Customer and Employee Information
- Market and Customer Analysis
- Company-wide Customer Information
- Total Quality Management – Company Culture
- Employee Information
- Team Development
- Company-wide Customer-Supplier Relations

Module 3: Process Management
- Basic principles of Process Management
- Project Management
- Process Analysis and Process Documentation
- Process Cost Accounting
- Process benchmarking, Management of Change
- Project Management in Project-oriented companies

Module 4: Quality in the Development Process
- Development and Innovation Processes
- General Development Planning
- Innovation Methodology
- Optimising Methodology
- Reliability Planning and Checking
- Reliability-Availability-Maintainability-Safety

Module 5: Quality in the Manufacturing Process
- Audits and Auditors certification
- Process Capabilities, Statistical Process Control SPC
- Production Optimising
- KAIZEN Lean Production Management
- Maintenance Management
- Special Requirements in Installation and Process Technology

Module 6: Quality in Procurement and Logistic Processes
- Procurement strategies
- Quality Agreements and Evaluations
- Procurement Logistics
- Industry-specific QM Systems in Procurement
- Transport Logistics
- Logistic Networks/Delivery Networks

Module 7: Quality in the Service Process
- Basic Principles of Service Processes
- Continual Improvement in Classical Service Institutions
- The role of the five interests partners in public law Organisations
- Business Excellence in private NPO's
- Customer and Employee Satisfaction with new Services
- National and International Examples of Excellent Service

Module 8: Environmental and Safety Management
- Environmental Management systems and Certification
- Ecological design, recycling, Clean Production
- Resource Management, Ecological Balance
- Safety at Work, Safety Standards and Organisation, Health Protection
- Certificated Safety at Work Management Systems
- Analogies and Synergy of SMS, UMS, QMS

Module 9: Total Quality Management – Company Leadership to Business Excellence
- TQM Company Culture, Responsibility to Society
- Ideas Management, Creativity Techniques
- Economical Viability, Cost Cutting Potential, Quality Cost Accounting
- Self-assessment, Reviews, Business Excellence
- Integrated Management Systems, Knowledge Management
- Legal Aspects of Quality, Environmental, Safety and Risk Management

Admission prerequisites:

Persons who
- have already completed an Austrian degree or doctorate
- were graduates of an economic or technical oriented college
- who have completed specialist training in the appropriate fields and could prove that they had at least five years of relevant work experience were admitted to the course

With regard to the number of admissions, care was taken that the size, as well as pedagogic and organisational aspects, of the group was expedient.
Application forms and an interview were the deciding factors for admission.
According to Dr. Brunner, applications at the present time come mainly from technical and economic graduates, but also some from the field of health.

8.1.2.5 Course completion

Students were awarded the title „Master of Advanced Studies (in Quality Management)“, MAS, upon completion of the course. After successfully completing the course, students were given the possibility of applying for the „European Quality Manager“ certificate.

8.1.2.6 Summary

The following conclusions could be drawn:

- There is a demand for SEQUI Managers
- The SEQUI Manager is interesting, above all, for small and middle-sized enterprises (SME’s).
- The module system of postgraduate studies makes it easier for those already working to graduate in the course.
- Experience should be gathered in the present job and then utilised.
- After this course, external consulting as well as internal SEQUI manager positions can be considered.

8.2 Case study from France[83]

8.2.1 The example MARPEQ training program : A new approach to teaching corporate risk management

Before presenting the M A R P E Q (Associate Management of Professional Risks in Quality and Environment) training system, it is important to go back to the beginning and mention the I H T (Institute for Humanities and Technologies) which created, developed and, we hope, will continue to improve it over the years.

8.2.1.1 The Institute for Humanities and Technologies

The IHT started its activity in 1995 within a GIP (Public Interest Group) under the authority of the French Ministry of higher education and research.
The GIP groups together universities, engineering school, research centres, industry and local government organisations representing the economic sector of the Pays de la Loire region.
The IHT is a higher education and research establishment, of which the vocation is to contribute to:

- characterising the origins and signs of interaction between social and technological environments
- analysing the evolution in societies and changes in the workplace with regard to technological development
- identifying new emerging professions and creating well-adapted training systems and tools
- evaluating changes induced by these training courses in terms of individual representation, group behaviour and consequences on the running of organisations.

In practice, the IHT is a place where these questions are defined and tackled in a balanced and symmetrical fashion by using experience and approaches stemming from exact sciences, social sciences and humanities.
Our activities come within the framework of national and/or EU partnerships insofar as this system, in France, is unique.
In short, the finalities of the IHT are to :

- understand and acknowledge the different value systems and forms of rationality
- promote interaction between the exact sciences, the social sciences and humanities
- overlap academic and economic cultures
- develop collective management methods for the complex and uncertain.

It is in this environment which appears somewhat utopian but in reality is very pragmatic and operational, that the training systems we are talking about here can be placed.

83 by Francoise Leclerce, CRCI

8.2.1.2 The inductive paradoxes of MARPEQ :

The educational engineering of MARPEQ constitutes an attempt at answering the persistence and recurrence of certain paradoxical situations observed in the field of risk management within a technological environment.
Thus, for example, everyone acknowledges, in an abstract fashion, that risk is by nature uncertain and probabilistic, and deploys a lot of energy managing it and reducing it, by using tools and methods based upon the relation of causality.
Furthermore, it is also known that individuals and organisations obey personal and collective representations as well as extremely variable value systems according to their history, their „rites“ and their „myths“.
In these conditions, why attempt to standardise the „man at work“ and homogenise the „corporation“ through a non-differentiated normalisation process?
For what reasons do vulnerabilities of a technological nature stemming from the same phenomena (mechanical dysfunction, pollution…) require rules and different standards that are sometimes contradictory and treated in an independent and compartmentalised fashion?

8.2.1.3 The foundation and principles of MARPEQ :

The diversity of examples of this kind and the permanent collective interpretation of returns on experience by the teaching staff of the IHT have led us to develop and adjust our training system according to the following principles:
Firstly, it must be considered that the notion of risk is located at the centre of management and that taking it into account is a constituent of the act of enterprise and innovation. It is the enhancing aspect of the notion of „chance“ that is the driving force of a corporation.
On the other hand, deciding that it is a constituent of the act of daily management, is not spontaneous. When confronted by the certainty of the relation of causality in force in most production processes, risk gives way to uncertainty.
This is why, in the field of risk management, formulating a problem, working out a proposal and finding a solution, often reveal a conflict between probabilistic points of view and strictly causal approaches made legitimate by processes of a technological nature.
We, for our part, consider that positive accounting for probabilistic reasoning brings about, on the management plan, two complementary and beneficial results: a considered and enlightened choice with regard the decision and a search for agreement and support with regard the collective action.
To us, only these two means are capable of transforming the uncertainty of knowledge into the legitimacy of a decision. They actually substantiate a collective guarantee that non-established knowledge is not capable of offering.
Secondly, innovative corporations must carry out permanent evaluations of opportunities and risks through four development principles that are generally accepted in industrialised countries.

- The „he who pollutes is he who pays „ principle which completely changes the very concept of corporate physical and legal boundaries,
- The“ precaution principle“ which encourages reflection on the nature and level of risk that corporations are prepared to accept and which helps to adjust decisions in a context of uncertainty and anticipate the future by avoiding irreversible effects,
- The „durable development“ principle which brings the corporation out of the ephemeral and into the perspective of historical time,

- The prevention principle which amounts, in the field of established knowledge, to the equivalent of the precaution principle in the field of uncertainty.

Indeed, in this long account which leads from the inevitability of danger and the uncertainty of risk to the identification of this danger and the conscious organisation of risk taking, the precaution and prevention principles help indefatigably to reduce the field of uncertainties, especially in the field of technological risks.
It is this approach to corporate risk management that is the permanent backdrop to our training system.

8.2.1.4 The MARPEQ educational approach

On the educational side, the students on this course are considered from the outset as having a built-in psychological and social background, especially with regard to the variety and different types of risk; the subject of the course.
Indeed, considering the level of maturity required at the recruitment stage, it has been noted that the students have very often been confronted with a diversity of situations in which they have created more or less explicit representations of danger and the attitude to adopt when faced with risk.
These attitudes are not qualified straight away but are taken into account as the receptacle of knowledge which will be dispensed. This individual psychological make-up goes together with a social make-up, of which most obvious vectors can be found in their home, educational and professional backgrounds.
After testing and assessing other educational approaches, it is this double construction which has been taken into account as the basis of the course.
We particularly make sure that students develop specific knowledge and know-how based on their own capabilities which they have themselves identified or society has validated (certificates and qualifications) as well as those they possess implicitly.
We consider that the assertion of style and internal coherence of behaviour are guarantees for future professional integration and for maintaining a long-term position in the workplace.
Various research carried out at the IHT has shown us that the perception of danger and methods for managing risks depend mainly on individual representations.
This situation has encouraged us to give a lesser importance, without ignoring them altogether, to „a priori“ organisation systems and concentrate our efforts on the actors. It reinforces the idea that organisation systems are mainly created by the actors themselves and that it would be futile to want to impose any „a priori“ on the pretext of supposed, or even recognised, effectiveness.
On this basis, we have directed our teaching towards the acquisition of skills in the fields of anthropological observation of work situations and the comprehension of systems of actors; to us, these skills guarantee a good understanding of the complexity of a corporation.

8.2.1.5 The finalities of the MARPEQ course

In this global context, the search for Quality, the Prevention of Professional Risks and Environmental Protection lose their rigid specificity in specialist fields to become tactical entry points in the setting up of an integrated approach to management.
Depending on the industrial, economic and social circumstances encountered in the field, and depending on the student, this approach will sometimes be inductive and sometimes deductive.

For example, an order for setting up normative quality control systems of reference (ISO 9000) or environmental management (ISO 14000) will take into account, in actual fact, the situation of people in the workplace and thus allow the actors in the field to look collectively for the most suitable solution between instrumental requirements and real work.
In another case, for example, of a limited order for the reduction of work accidents in a production unit, the approach will lead to a more or less full transformation of the production processes or organisation methods that are also beneficial to Quality and Environment.
In our teaching we are thus looking for a joint cohabitation and operational utilisation by students of various paradigms whose origins and legitimacy can be found in engineering sciences, physical, chemical and biological sciences, administrative and organisational sciences, legal and social sciences.
These paradigms serve actions carried out by students during their in-company work placement.
Group meetings called „return on experience“ are used in the sandwich course system to allow each student, in a constructed and well thought out fashion, to present the different aspects of the context of his/her placement, how the placement went and the way in which he/she identified and solved problems. These accounts are then systematically analysed and discussed.
The complexity of the corporation is taken into account, as well as the balanced use of different paradigms stemming from various disciplines to describe the situations encountered and develop strategies. This forms the focal point of the course.
The teaching staff ensures that greater importance is not given to one paradigm to the detriment of others without in-depth analysis, and that certain disciplines are not thought to be designed purely to serve others such as the way social sciences are considered with regard the exact sciences.
Lastly, the contribution or the reinforcement of knowledge come naturally within the framework of a context of individual collective awareness with regard to the mechanics of construction of knowledge and technically valid and socially acceptable representations.
For us, it is a case of making the students aware that there are two forms of construction of „truth“: truth through proof which is a question of demonstration and calculation and truth through agreement which originates in negotiation and support.
From a practical point of view, this post-university course has had, for the past five years, an enrolment of about twenty students mainly from technical and scientific backgrounds, who then find professional prospects in diverse structures such as large industrial groups, small and medium sized companies, consulting firms…

8.3 Conclusion of training profiles emerged by the case studies

The necessity to update the knowledge and training of people is certainly present.
The fact that the laws considered the information and training of people as specific obligations of a company, have certainly contributed to its valorisation, devoting important resources to it. On the other hand, it has transmitted **a bureaucratic and formalistic** conception of training in companies.
The internal synchronisation of the three Sequi training aspects is a process-oriented approach which requires a complex way of problem solving and a major need for internal and external network work. The analysis of the interviews and case studies partly points to a lack of understanding and awareness.
Particularly, in some of the enterprises involved in the research, the law obligations have been translated in activities of training and qualification of the employees, with the help of consultants to organise courses of fire protection or first intervention. Once these obligations are fulfilled, enterprises considered to have satisfied the training needs existing in the company. This happened implicitly, setting up a coincidence between the minimal requested by law and their internal exigencies (demands, requirements,).
With regard to **Sequi** objectives, we have to find out the training path in a more precise way. Apart from law requirements and academic lessons, new modalities have to be created to handle with interdisciplinary.

The case study Gutwinski is particularly interesting for the SEQUI project as they offered a course within the framework of the EU project „EVAS“ – Women in Environment And Safety. This was the first course to combine safety, environmental and quality management in a training programme.

The training programme was tightly packed and covered the following areas:

- Project management, personal organisation and time management,
- Employee safety – training to be a safety specialist in accordance with BGBI 277/1995, carrying out evaluations
- Waste economics – training to be a environmental specialist: environmental management, environmental Law and the technical and scientific basics of environmental protection
- Quality management – training to be a quality manager, quality management according to the ISO 9000 series, creating, auditing and certifying quality management systems, Total Quality Management
- Experience in company business management
- A six-month practical project in a company
- Applications and founding advisory services
- First aid course (16 hours)
- Training to be a fire safety officer
- Internet and data processing training
- Imparting basic knowledge in communication and mediation techniques

Upon completion of the full training programme, the participants receive a certificate as:

- Safety specialist
- Quality manager
- Waste management representative

- Environmental
- Fire safety officer

The usual certificates for the individual jobs were issued but not a new certificate for a new profession. For the Sequi Project it is interesting that none of those who completed the course are working as Sequi Managers but employed in only one of the three fields because Austrian market is not ready for the new profile of Sequi Manager.
Regarding the module system versus college, according to the interviewees, pure university education would not be useful in this sector. First of all, the course was very practice-oriented which would not be the case in a university education, and for this type of job relevance to practice is necessary. Universities do not have the necessary contacts to companies so that the students who finish the course can also find jobs. The training course must be extremely practice-oriented, a university type training has only limited appeal.

The course „Quality Management Environment, Safety" at the **Donau University, Krems**. is a postgraduate course which lasts three terms. It is considered a course which can be attended alongside a regular job which means that persons already working in a company are able to attend the course. The course consists of nine modules. The course aimed at the following target groups:
As an additional qualification for young academics, persons responsible for processes and projects, executives and executives-to-be and engineering specialists aiming to achieve a level suitable for Europe.
Persons who had already completed an Austrian degree or doctorate,
were graduates of an economic or technical oriented college who have completed specialist training in the appropriate fields and could prove that they have at least five years relevant work experience were admitted to the course
With regard to the number of admissions, care was taken that the size, as well as pedagogic and organisational aspects, of the group was expedient.

Course completion
Students were awarded the title „Master of Advanced Studies (in Quality Management)", MAS upon completion of the course. After successfully completing the course, students were given the possibility of applying for the „European Quality Manager" certificate.

T**he MARPEQ course** – Associate Management of Professional Risk in quality and Environment
Marpeq is a post-university training course carried out by the Institute for Humanities and Technologies. The students mostly have a technical and/or scientific background. The course strives to extend problem-solving competence with an integrated approach. The paradigms of the course are:

- Engineering sciences
- Physical, chemical and biological sciences
- Administrative and organisational sciences
- Legal and social sciences

The paradigms mentioned are introduced into the course by the students themselves based on their background in in-company work placement, and vary according to the students' orientation. Group meetings called „return on experience" are used in the sandwich course system to allow each student to improve their skills. Students who have completed the course find their job market integration in the industry sector, SME's and consulting firms.

8.3.1.1 Final considerations of the trainings profiles

The case studies examined had the purpose of diagnosing the modalities and characteristics of the transitions happening in the field of safety, quality and environment. In general terms we can state that for companies with leading role in their field, the push to the Sequi implementation was given by the organisational factors but without being aware of that.
In fact even if the ability to analyse the critical points of the productive system in a company is quite developed, managers usually don't have the same abilities to diagnose the critical points of safety, quality environmental problems e.g. the reactions of workers towards safety problems or some bad modalities of protection.
The management is certainly much more concerned with the harder variables of the integrated management of safety, environment and quality than the softer one.
The results, which emerged from the diagnostic part of the research and later on from the case studies, confirmed the importance of having external actors who are able to catalyse the implementation of change processes in the company.
This role becomes vital (indispensable) for a more detailed individuation of existing vocational training needs which can deeply involve the actors who belong to the enterprise for the process of organisational models and management tools to be more evolved. For this reason, the Sequi results will certainly be diffused to several industrial districts, even because from this second part of the research several guide-lines emerge which could be deepened both by managers or trainers. For example, a first area of investigation concerns the extendibility or adaptation of the Sequi approach for another organisational context different from those analysed, both with regard to the dimension or fields of activities (great distribution, tertiary, public administration, public services. Etc..) and the geographical area considered (other European states or associated states).

Further training versus initial training:

The analysis of the interviews as well as case studies show that preference is given to further training as opposed to initial training. Further training offers are predominantly found in the private training sector. Universities have the image of not being flexible and practice-oriented, even trailing behind the demands of the job market. Private training institutions however have the upper hand in the possibilities for practice orientation as opposed to universities. Also, private training institutions show more proximity to enterprises, which is beneficial for the students when it later comes to implementation, placements and job market integration.
The reasons of the preference for further training are:

- the work experience which is indispensable in finding acceptance in the enterprise,
- the continuous changes in laws, which demand a lifelong learning process –attending a course once doesn't do justice.

A counter argument in the discussion of further training versus initial training comes from the Italian partners, who contend that young people obtain more advantage in competition through the new distinction.

The expectations of a coherent Sequi training program are:

- each player has to find his/her place and speciality
- a synergy of the players in the training anchored in concrete projects which implies listening to the companies, who are in fact the real initiators of projects.

Other opportunities of extension in the analysis of the methodology experimented by Sequi could be:

- Social dimension: the development and application of tools to verify how the behaviour in a company changes;
- Economical dimension: the definition of methodologies finalised to the evaluation of the economical dimension of safety, environmental and quality problems;
- The individuation of precise innovative training paths of all the actors involved in the management of safety, even when inspired to adopt experimental approaches.
- Evaluation of the job market integration according to type of training and further training

9 Conclusion

9.1 Sequi in firms

The criteria adopted in the selection of the **Sequi** case studies permitted the researchers to assist or take part in the important phases of the evolution of integrated safety, quality and environment management. We have to stress that each of the case studies examined show that Europe is approaching Sequi matters with great differences due to several factors like:

- The differences in the interactions of the internal actors;
- The solicitations coming from the surrounding in which the companies or institutions are set up;
- The economic situation to which companies belong.

It is important to stress that the results of this process of cultural, managerial and organisational change is not granted, and could be under discussion in any moment. The only variation of one of the three above-mentioned points could cause tension in integrated safety, quality and environment implementations.

With these considerations emerging from the **Sequi** case studies, we can summarise the specific modalities finalised to the support of the process of transition.

Integration is a must

The future of safety, quality and environment clearly lies in the application of the various reasons listed below:

- to strengthen and improve the company image through certification processes
- to ensure commercial survival in national and international markets
- to efficiently plan the time expenditure for information, control, documentation and audits
- to efficiently plan the cost expenditure for the measures mentioned above
- to ensure the compliance of employees in business management

Internal Sequi management depending on enterprise size

Small enterprises normally see no possibility in internally engaging a Sequi manager specifically trained for this. The lack of human, financial and technical resources should be taken into account. However, they very well point out the importance of achieving the integration of safety, environmental and quality aspects in the consulting and certification area. All enterprises base their argument for the integration of QSE on the minimisation of expenses and time; this is especially so by small enterprises. This clearly shows that the Sequi concept is predominantly significant in the consulting and certification area against the background of a high presence of small enterprises in the European region. Following the Swedish concept of „Flying Gender Experts„ (a gender expert carries out a single gender diagnosis of the enterprise), we propose a „**Flying Sequi Expert**".
However, among the medium and large enterprises, the demand for internal Sequi management clearly exists.

Legislation as an impulse for organisational innovation

A consideration as a result of the analysis of the case studies concerns the redefinition of organisational culture, which the recent safety, quality and environmental legislation will introduce.
In fact, coming from European laws, the approach to Sequi matters in some European countries is a recent acquisition of a small number of enterprises which often have problems to formalise responsibilities and institutionalise some practise.
European safety, environmental and quality laws made a great impact on the enterprises through the clear definition of organisational roles (the entrepreneur, person in charge of safety service, representative of employees, physician of safety service, Sequi managers) with precise responsibilities and tasks. When we analyse the roles and tasks of these professions inside the company, it becomes clear that the evolution of the Sequi management is essentially a „top-down" process. This „top-down" process is requested and guided by the Direction of the company (or a representative empowered by the company), who has, as a primary purpose, the direct involvement of the other functions and intermediate levels of the organisation.
It is exactly due to the involvement of these functions that the intervention in the organisation and management modalities of the integrated management of quality, safety and environment has started.

The external network

Besides the analysis of the professionals in the company, particular attention has been given to the individuation of the network set up by the company. From this analysis, we understood that a concentrated network of relations can help and facilitate a grow of the culture of Sequi introduction in companies.
This can happen through the high mobility of the specialised personnel, frequent exchange of relations between the company and control authorities and rooting of associations which involve the enterprises and transmit information and tools.

To this day, however, the problems related to Quality, Safety, and the Environment seem to be treated separately even though the necessity in approaching them in an integrated way is making itself felt.
The principle resistance to this integration seems to be :

- economic factors (return on the investment of creating this type of position),
- unsatisfactory (or unknown) needs of the industrialists in terms of professional profile.

This role becomes vital (indispensable) for a more detailed individuation of the existing vocational training needs, which can deeply involve the actors belonging to the enterprise in a process of organisational models and more evolved management tools. For this reason, the Sequi results will certainly be diffused for several industrial districts, even because several guidelines emerge from this second part of the research which could be deepened by both managers and trainers. For example, a first area of investigation concerns the extendibility or adaptation of the Sequi approach for other organisational context different from those examined, both regarding the dimension or fields of activities (great distribution, tertiary, public administration, public services, etc..) and the geographical area considered (other European states or associated states).

Other opportunities of extension of the analysis of the methodology experimented by Sequi could be:

- The development and application of tools to verify how the behaviour in a company changes;
- The definitions of methodologies finalised to the evaluation of the economical dimension of safety, environmental and quality problems;
- The individuation of precise innovative training paths of all the actors involved in the management of safety, even when inspired to adopt experimental approaches.

9.2 The Sequi training format

9.2.1 The role of Sequi trainers[84]

Before trying to design ideal Sequi training forms, it could be quite important to underline in which context this forms could be in to be of some help to the actors of the training field. This is why it is necessary to define the Vocational Training field.
It is not easy to offer a synthetic definition of the Vocational Training which can delineate all its institutional and organisational aspects, because it is a complex organisation, a system addressed to an ensemble of services for the citizens.
As a system, Vocational Training is characterised by:

- Several internal elements which operate with roles and different functions, to reach the same purpose;
- Laws and national, regional and European considerations which define the specific objectives of the system and settle the relations between the different elements;
- Specific working activities, of which elements help to reach general purposes.

Environmental, safety and quality laws impose training and information activities on the employees of a company because to work in their respective fields it is necessary to know technical modalities.
It is fundamental to identify the inside and outside of companies of the professional profiles who, having key knowledge in the Sequi field, also have the skills to relate to workers to give the necessary information.
It is important to remember that to train people means to diffuse the knowledge of exploiting and adding value to each employee. When a training activity starts, it is always necessary to consider the following aspects:

- Teaching and learning are two different aspects,
- To train experienced adults is different from training workers at the first job experience,
- The purposes of the training activities must be clarified with the identification of the most suitable teaching methods,
- The material that will be used to project the lessons must be in coherence with the purposes of the training activities,
- The style of conducting the training must be coherent with the kind of people who are subject of the training.

84 by Sabrina Bandini, Cra Montecatini

What does it mean to learn?
The main purpose of training is to make people be able to use the information received during the training activities in their daily jobs.
If we would define it, we could assert that to learn is a „subjective approach which determines a change of the interaction style with the work environment „.
For the adult, to simply learn means to assimilate the capacities to change or be able to approach a problem from another point of view, exploiting its own experience.
This is why if a specific training activity doesn't reach a true change in the working approach, it means that the activity didn't reach the prefixed objective.
To assimilate notions is not so useful if the style of work remains unchanged.
The increase of cultural knowledge must create an improvement in professionalism.

What does it mean to teach?
Considering our Sequi definition of learning, we can assert that to teach it means to transfer contents, but above all to set up didactic strategies which are able to sustain a learning processes of the people in question. Training is suitable when it is possible to establish a balance between contents and methodological approach. If the trainer focuses his/her attention just on the contents, we risk not giving the employees enough elements which are able to motivate the change and consequently not modify the style of working.
It is clear that training based uniquely on notions is not suitable to change the objectives needed by a company and which give the impulse to train their employees.
The „challenge" for the Sequi trainer is based on a simple question: What has to be done to help people learn?

The answer can be found in five fundamental points:

- **Who are the subjects of the training?**

The subjects of the training activity are certainly the more important variable. To avoid the situation that the trainer's wrong approach creates a reaction of closure or refusal, the trainer is asked to set up the right language, not just in the function of arguments treated but also in consideration of the knowledge already acquired by the people trained, who will be requested to make great mental effort to follow the change.

- **What is the sort of learning the trainer strives for?**

Normally in a training activity, the contents are greater compared to the capacity of learning. This is why it is important at the beginning to establish which contents are of maximum priority. It is important to be aware that this new information will be compared and filtrated with the knowledge that the subject already has. A great difficulty will certainly be to ask people to change their strong attitudes. This result can be obtained to discuss the standards already existing to create new opportunities for new approaches.
To create the motivation to change, it must be clear that this will certainly create personal conflicts for the trainees.
The tension that will emerge from these conflicts must be managed by the trainer to avoid new behaviours of resistance.
To avoid this kind of resistance it is certainly important to set aside time for discussion during the training activities to help a constructive approach grow.

- **What is the sociological - organisational context in which the training activities are carried out?**

This aspect concerns above all the training activities developed by consultants. In fact, an enterprise is always applied in a larger context of its own limits. To try to understand how important the training is for the enterprise is of vital importance for the trainer. If the training was organised to not just achieve a concrete aspect but absolve a formal request, the trainer will be requested to generate and maintain a high level of motivation among the participants.

- **What are the resources at disposition?**

For resources at disposition we consider above all times and tools at disposition. It is substantially an organisational variable which must be taken in consideration, even if not strategic.

- **What are the didactic methodologies?**

Didactic methodologies are the variables directed by the trainer. In fact, if the foreseen aspects cannot be taken in consideration (the trainees are not chosen by the trainer and neither the organisational context or the resources depend on the enterprise), the didactic strategy is the exclusive competence of the trainer. This will create a climate favourable for learning, which is of basic importance to reach the objectives.
A didactic activity can be developed in several ways:

- Through formal lessons,
- Through practical exercises,
- Through discussions, in which the different experiences of the employees can be compared,
- Through simulations which permit all the theoretical acquisitions to be put in practice.

Sequi doesn't formulate a standard but the above-mentioned list would just guide the teacher in the evaluation of the background of the people.

Some aspects which differentiate the training of adults and young people

To start the training activity for an adult is very different from starting it for young people.
In the table below the main differences in this process are summarised:

Young person		**Adult person**
Depends on others for the lack of knowledge	***Concept of self***	Great need to be known as an independent subject. There is the risk that resistance behaviour is adopted.
Low importance	***Role of the experience***	Every new information is compared with the experience. It is important to value the experience of each trainee
Unconditioned	***Availability to learn***	Need to find the utility of training in the short term. It is important to make clear the purposes of the training from the beginning
Linked to specific disciplines or technical aspects	***Learning orientation***	Linked to concrete problems. Need to link it to reality

When starting training for adults, it is always important to follow the seven key recommendations:

- It is always a complex learning where applications with past experiences are inevitable,
- A modification of the own image is always requested which touches consolidated balances
- In adults changes may create emotional reactions of refusal to change
- Adults need to have a clear motivation in the training activity. It is necessary to devote enough time to transfer purposes which have to be clear and shared among the training class
- A psychological agreement has to be reached to create a better availability of people to participate actively in training activities. This agreement consists of a meeting point between objectives and requests
- The importance of a logical „global-peculiar-global“. For the adult it is fundamental to understand the significance of the training activity which has to be applied in a wider context with global purposes and don’t have to be just linked to the main topic of the training
- The adult rarely accepts a training of scholastic kind and asks to participate actively bringing in class his/her own experience. It is fundamental to foresee moments of discussion or comparison.

To train and inform is not a simple activity because it shows aspects which when not taken into consideration can provoke a failure of the activity itself.
Particularly the fields of prevention, environment, quality and safety are a very complicated one because the topics are rarely of very well defined technical aspects. They intend to modify behaviours and have to act above all on the human component trying to stimulate different approaches to modify the previous experiences.
To train the „trainers“ is not simply a slogan because what’s important is not to teach but to grant the learning. Training doesn’t simply have to be efficient but efficacy.

What is important is not what I taught but what they have learnt.

9.2.2 Placements – good practices[85]

It seemed important to us, in this book, to propose a tool which would facilitate a dynamic process between the three partners of a traineeship : the company which defines a new professional, SEQUI-type profile should be able to embark on a permanent dialogue with a training system, attentive of its needs, the trainee being the vector of this dialogue.
This tool presents the five principle stages of a traineeship :

- The project definition
- An exploration allowing the principle players to make contact
- The choice of subject by the trainee and of candidate by the company
- The traineeship
- The evaluation.

This tool is extracted from the « guide for a traineeship in a company » which was elaborated within the framework of the LEONARDO DA VINCI program of the E.U. (COMOUEST project), Web site : www.guide-du-stage.atlantech.fr. This was undertaken at the initiative and with the co-ordination of the Regional Chamber of Commerce and Industry of Pays de la Loire, France.

What are the college's expectations?

- Improving young people's integration into the job market by helping the student make realistic choices and undertake a professional project
- Check the relevance of one's education and training
- Find out and integrate the changing needs of the company into education and training
- Network with companies or reinforce existing contacts
- Develop skills and exploit research findings

What are the student's expectations?

- Test and apply one's knowledge and abilities
- Discover the company and its environment
- Integrate into a professional milieu
- Prove oneself
- Prepare for the future by testing the water

What are the company's expectations

- Get a project done
- Locate and integrate skills and / or techniques
- Help young people develop in the company
- Help the development of well focused education and training,
- Benefit from an outsider's opinion

There are many ways to get involved in a work placement and the outcome depends on the individual!

85 by Francois Leclercq

Step 1 : Definition

College – Student – Company

- What are the company strategies?
- What are the issues and challenges brought up by these strategies?
- With what time scale?
- What projects are currently being carried out?
- What skills and competencies are needed for these projects?
- Can we use a student on a work placement?, consultancy?, technical support?
- At what level can a student get involved?
- What do we expect from such a work placement?
- Is it feasible within the context of his/her education?

What can help companies? (Some examples of student projects)

- Production planning analysis
- Analysis of user feedback
- Quality follow-ups
- Assess the effects of communications technologies and the skills necessary to exploit them
- Technology audits for the company
- Key technologies analysis

Where is the project at? At which stage can a student be the most useful?

Emergence of the idea:

- Seek information/data relevant to the project
- Clarify priorities and define the set-up of the project
- Review the necessary skills and existing skills

From the idea to the project:

- Validate the idea, conduct a feasibility study, observe how norms change, analyse solutions chosen by competitors
- Estimate the costs
- Plan and organise
- Study the market and clientele

From the project to the product:

- Define the means of production
- Study and produce a machine, specific software
- Organise and plan the stages of the project

From the product to the market:

- Plan and organise for the product – promotion – distribution-manufacturing
- Manage the commercial development

A problem to solve? Why not take a student on a work placement?

Step 2 : Exploration

Company:

How to reach the college likely to provide the skills sought:

- Who in the company has contacts with colleges and teachers and in what context?
- What information is available to the company? Who does the student recruitment? Who manages most of the students?
- Did the company ever do a stock taking of the colleges which worked in its own technical areas?
- Does the company have regulations on work placements (dates, obligations…)?
- How and to whom does the company present her skills and competencies?
- Has the company written anything on the skills / competencies it is looking for?
- Has the company developed a selection process for students?

College and student:

How to target a suitable company?

- What mechanisms are already available, through which companies can be contacted?
- Who manages and collects information about companies? Who distributes this information to lecturers?
- What image does the college or students give to companies?
- What links does the college have with the networks that provide information about companies? (Chambers of Commerce and Industry, professional bodies, consultants) …

How can we meet?

Step 3 : Choosing

Company :

- How does the company establish contacts with colleges?
- How does the company get in touch with students?
- How does the company select the student for the work placement? What criteria?
- How does the company ensure adequate supervision?

Student :

- Is he / she prepared for the „work placement“ interview?
- Is he/ she prepared to undertake a work placement project?
- What tools / techniques / skills are needed?
- How do you get information about the company and work placement?
- What follow up is needed after the interview?

College :

- Can it help the company to select students for work placements?
- When and how should the college prepare the students with a „pre-work placement“ interview?

- What tools, means and techniques are needed to support the student during a work placement? And to support the company?

Did everyone identify their partners?

Step 4 The placement:

Reception of the student :
Introducing the student to the company and project?

Company:
- How should the company introduce itself to the student?
- What approach or procedures can the company use? They may have to be adapted differently for different students
- At the beginning, make sure the student (and the company!) knows the structure of the work placement. (methodology, plans, stages of the project, feedback mechanisms, dates for the reports)
- Are all the equipment and materials available for a quick start on the project?

Student:
- What are the essential things you need to know about the company, placement and project?
- Is documentation available on the company, conditions of work and project?

The work placement takes place:

What are the strengths and weaknesses of the company and the student?

Company:
- Have the assessment phases of the project been defined? How was this done?
- How do you spot that the student is in difficulty?
- Is the project flexible enough to be adapted, is it absolutely excellent or very weak?
- When and how does the company call upon the college for back up?

Student:
- What are the issues in fitting into 1) company work structures and 2) undertaking the project?
- How do you find out what is already available or what work has already been done on the project?
- Who do you turn to if problems arise in the company and in the college?
- Is there a confidentiality clause?

College:
- How can the college help the student during the placement: visits, technical back up, etc.?
- Has it been agreed with the company when and how it will assist during the work placement?

Work placement: training for everyone

Step 5 : Evaluation

Evaluation of the work placement

What conclusions can be drawn on the skills / competences which have been used and those that are still lacking? How does the college use this assessment to develop its courses?

Company:

- What are the criteria used for evaluation? Who participates in this evaluation?
- How does the company analyse the differences between the expected outcome and the actual outcome? If there were difficulties,
- Was it because of the time scale? Because of the student's skills? Because of an inadequate initial design? Because of a lack of support?
- Was the company open enough to the student and college?
- Is the company happy with the type of evaluation criteria used by the college? Are its own criteria more appropriate?
- How does the company share its evaluation with the college and student?

Student:

- How and when should you start to evaluate the work placement? How should your evaluation tie up with that of the company and college?
- What have you learned about your own strengths and weaknesses from the evaluation?

College:

- What evaluation criteria are most appropriate? How does the college evaluation tie in with the company's evaluation?
- How does the tutor evaluate his / her role?
- How should the college interface its evaluation with that of the company and student? How does it use these findings to change its courses? What mechanisms and procedures are used?
- What does the college say to the company about what it intends to do about such shortcomings?

The follow up of the work placement

The end of the work placement is not the end of the project for the company.

Company:

- How will the company be able to develop its project?
- With its own resources?
- With external help? Another student on a work placement? Through a work contract?

Student:

- What useful follow-up can you develop from the placement? In the company? In other companies (watch out for the confidentiality clause)?
- How can you make the most of this experience for your career path?
- How do you make the most of your work experience and project?

College:

- What follow-up should be given to the work placement? (change in courses, offer of technical support, R&D)
- What follow-up should be given to the work of the student? (on-going contacts with the company: new partnership, research contracts …)

A thorough assessment starts again – but on a higher level

9.2.3 Guidelines in SEQUI training formations[86]

An enterprise is a complex system of conflicting economical and social elements. The task of a Sequi manager or consulter is to implement a learning enterprise culture. He/she is the opinion former and motivator.

The following tasks belong to the job profile:

- Consulting
- Organisation
- Documentation
- Innovation
- Information
- Control

This requires a distinction in the following areas of competence:

- Technical competence
- Juridical competence
- Management competence
- Scientific competence
- Communication and social competence

Due to the interdisciplinary topics and requirements in the Sequi area, it is important to address and train the **soft** as well as **hard skills** of the students.
If the Sequi manager wants to e.g. successfully change the conduct of the employees, psychological skills are needed in order to apply the legal and technological know-how in the enterprise. Specific knowledge in technical safety, environment and quality questions isn't necessarily applied in the enterprise if the specific communication structure and its intervention possibilities are not reflected. The Sequi manager or consulter also often takes on the function of a change managers and problem solver. These tasks demand a person with a high level of social competence.

[86] by Maria Schwarz-Wölzl

The following comprehensive qualifications are expected of Sequi managers or consulters:

- Method competence: Management, communication and presentation methods, etc.
- System competence: Overview knowledge of neighbouring fields, comprehensive and system-oriented thinking, development of system related alternatives, scenarios and versions etc.
- Organisation competence: Understanding for organisational connections and work processes, capability for teamwork and mediation, basic knowledge of project management and in the conclusion of comprehensive projects etc.

The Sequi concept must fulfil the following requirements:

- The ability to integrate the three management systems should ensue through solid qualification.
- This solid qualification should be clearly recognisable, so that the name SEQUI manager or consulter can develop into a generally recognised and attractive qualification or professional goal. The goal is a contour which treats the relevant organisational developments and processes as the main qualification aspect instead of just providing know-how of technical and legal content.
- New didactic concepts like distance learning, project work, placement, coaching, etc must be incorporated
- Interdisciplinary and internationality must be taken into account.
- On the one hand, interdisciplinary of the topics is necessary, on the other hand, with regard to the contents, the option of specialisation in one field is necessary in view of the huge scope.
- The requirement of a high level of relevance to practice is to be taken into account in each case.
- Through the course contents and methods a target group as wide as possible should be addressed to.

It is a matter of adapting the training and further training to the requirements of the developing trend towards interdisciplinary of safety, quality and environment. Training in the area of SEQUI cannot be just the sum of the theoretical lessons but demands methods which offer the best simulation of reality. In this way, the teaching and learning forms change: it doesn't need a quickly thought substitute of classic pedagogy but involves an innovation through the changed process of generating, distributing and applying knowledge. The function of the trainer is no longer the formed source of knowledge and learning is not treated as equal to „lecture hall study„. Knowledge is increasingly theme and student oriented, not teacher oriented. In the training offer, the multi-availability of information must be shown and made possible. The trainer then adopts the focused function of mediation, moderation and coaching.

The SEQUI concept requires a training and further training offer which clearly distinguishes itself from the training functions and offers in „classic„ institutions like universities as well as purely commercialised further training centres.

The SEQUI training centre is not isolated in itself but shows a row of potential connections to the tasks and activity areas of other facilities in its contents and offers: other training centres, enterprises, consulting firms, universities, etc. Networking with externally distinguished competence centres and keeping open, preparing and making possible the perspectives and options for the future development of students are important. This means that universities, enterprises and vocational training centres must work together to be worthy as tutor in the interdisciplinary network of the students.

- To facilitate the job placement of young people who have different levels of public education
- To the valorisation of human resources already applied in the productive world, in a logic of vocational training during the whole life (update, retraining, specialisation)
- To enter the social and economic organisation to satisfy the needs of weak people or people with diseases in society who have difficulties to find a job (women expulsed by the market, unemployed adults, people having deficit, non- European citizens)
- To offer services to the enterprises to innovate and adapt the technological innovations

The following principles result:

- Modular course organisation: The different course contents are offered as complete courses. Individual courses lasting from a few days to several weeks can be attended separately. For every course there is an attendance certificate.
- Project work: to fulfil the requirements of being practice relevant
- Organisation of course groups
- Placement
- Course surfing

In this context the target group of the Sequi concept is:

- Sequi manager
- Sequi consulter
- Sequi certifier

9.2.4 Specifying the curricula for particular training needs – chosen models of good practise

In the following, examples were chosen from Austria and France. Due to the diverse training and job training system in both countries, it is not permissible to directly transfer the country specific curricula suggestions to other countries. In France, in the 80’s reforms regarding job training, and technical „baccalaureates„ and new job training branches within the college system were made. However in Austria preference was still given to the traditional college degree and post-graduate further education area.

The suggestions quoted below should therefore be regarded as **stimulation for further discussions**.

9.2.4.1 Initial Training

a.) Private training centre
b.) University training centre

9.2.4.2 Further job training

a.) University/private training centre
b.) University training centre

ad. 9.2.4.1) Initial training

As already mentioned the Sequi training concept can also be implemented as a **job market integrative training measure**.
Target groups can be

- young adults, who broke off their education
- persons who are difficult to integrate in the job market due to a handicap
- women expulsed from the job market

Regarding the last point, the following case study

Example 1 Initial training of private training centre:

„An Experience Oriented Course for Academics in Employee Safety, Environmental; Quality and Total Quality Management„

Gutwinski Umweltmanagement GesmbH
Aspettenstraße 48
A-2380 Perchtoldsdorf
e-mail: bdonninger@gutwinski.at

is a clear example for initial training for unemployed female graduates in Austria. There are no other comparable courses in Europe. Due to the 100% job market integration of the course graduates, the training concept deserves special mention. The course is explained in detail in chapter 8.1, here just a brief mention is given.

Example 2 Initial training of private training centre:

Securite Environnement Prevention[87]

Groupe ISAIP – ESAIP
Institut Superieur recunnu par l`Etat
associee a l`Univeriste Catholique de l`Ouest
18 rue du 8 mai 1945 – BP 22
49180 St. Barthelemy d`Anjou cedex 1, France
http://www.isaip.uco.fr

Note: The course was conceived approximately 10 years ago and concentrated initially on Safety and Environment, hence the course title. However, to fit in the general trend towards Sequi, quality management was implemented as a training element about 2 years ago. Indeed, some of the course graduates then started working as quality manager. The course was therefore chosen as an example as it combines all three areas of the training program.

Objective :

With the increasing complexity in all areas of human activity and the increasing pressure to reduce the level of risk and minimise the consequences of accidents, there is an obvious need for engineers with new professional attitudes and skills.
The French Engineering Diploma “Security Environment Prevention” aims at developing engineers:

- capable of global risk management
- with analytical skills who take the scientific, technical, economic and legal factors in problem solving processes into account
- With the increasing complexity in all areas of human activity and the increasing pressure to reduce the level of risk and minimise the consequences of accidents there is an obvious need for engineers with new professional attitudes and skills.
- The French Engineering Diploma « Sécurité Environnement Prévention » aims at developing engineers :
- able to put into place a system of integrated management aimed at maintaining a high level of coherence between the areas of Safety, Environment and Quality and at the same time optimising the overall impact of these different approaches in company performance.
- with mastery in cost efficient risk management
- capable of offering solutions at the technical, human and financial levels to guarantee the ongoing reliability of production installations.

The (private) engineering school ESAIP (in the group ISAIP-ESAIP) has developed a new approach to training engineers based on the personal professional project of each student, study periods and professional experience in three European countries for every student, an active network of partner universities and engineering schools and companies throughout

87 Short summary by **Steve O`Brian** (Course Leader and Senior Lecturer) and information added from telephone interview.

France and Europe, and a research team working specifically in the areas of risk analysis and management.

Target group:
Students are recruited after having successfully completed **a two-year graduate diploma** in any of the areas of industrial engineering (electrical, mechanical, quality, chemical, …), occupational health and safety, environmental science or scientific studies (physics, biology, chemistry, …). Their admission is based on an assessment of their dossier (academic results, CV, a letter of candidature, references), admission tests and two interviews (professional project and one in English for the international motivation) in front of a jury of academics and professionals.

The course lasts three years :

First year : Duration: ca. 1300 hours
1st semester in France :
Scientific modules (physics, chemistry, biology, mathematics)
Technical modules (mechanics, informatics, security systems, ergonomics, health and safety, financial management, industrial processes, law and European regulations)
Environment (hydrology, geology, meteorology, oceanography)
Communication (English, Spanish, German, presentation techniques, management)

2nd semester in Great Britain : students are integrated in a similar course and follow modules which compliment their main areas of study :
Occupational health and safety management, radioactivity, environmental noise control, human factor,

Summer period : A two month industrial placement (or in the tertiary and public service sectors) to live and study the day to day professional activities of an employee, preferably in an English speaking country

Second year : Duration: ca. 1300 hours
1st semester in France
Scientific modules (physics, chemistry, biology, mathematics)
Technical modules (mechanics, materials, security of information systems, informatics, design and regulations, transport stockage and distribution, industrial processes and monitoring systems, health and safety, ergonomics, risk management, safety environmental and quality management, insurance, financial management, law and European regulations)
Communication (Spanish, German)

2nd semester in Spain or Germany : students are integrated in a similar course and follow modules which compliment their main areas of study :

Summer period : A two-month industrial placement (or in the tertiary and public service sectors) to develop a technical project in the areas of safety, environment, quality, preferably in an Spanish/German speaking country

Third year :
1st semester in France Final year scientific and professional projects, with special courses in safety environmental and quality management (ISO 9000, ISO 14001 and ISO 18000), risk analysis and management, human factor

2nd semester in France or any other country : A six-month company placement to develop the policies and strategies of the company in safety, environment and quality.

The students obtain their diploma on the presentation of a thesis based on their company placement before a « jury » of academics and professionals.

The cost of studies (year 2000) is 23000 French francs per year

Example: Initial training at university training centre:

Industrial Management[88]

Proposition de Licence Professionnelle

Institut Universitaire de Technologie de Lorient
10 rue Jean Zay
56326 Lorient Cedex, France

A concept in the application stage
Academic degree after 3-year course

Objectives:
The concept "Industrial management" pursues the objectives in business culture, based on business equipment, production and maintenance, safety, health, environmental quality, communication and employee management. The aspects mentioned here are closely interrelated and affect both the organisation and management.
Labour market oriented observations have shown that graduates of technical colleges possess too little management skills, i.e. they are not yet qualified as executives.

Four different target group types:
- A-Levels + technical university diploma (= 2 years)
- A-Levels + certificate of technical high school (= 2 years)
- A-Levels + general university diploma (= 2 years) at a scientific faculty
- A-Levels + scientific and technical university diploma (= 2 years)
- Principally persons with such education are regarded as having a graduated proof of skills.

88 The information documents materials were kindly provided by the training centre.

Degree:
Licence

Course program:

- 550 hours consisting of 400 hours of lessons and 150 hours of project work
- Practical training of 13 weeks
- Total course duration: 755 hours

The 400 hours of lessons consist of:
40 hours: Basic knowledge of management skills
150 hours: Quality, maintenance and production, safety, environment
70 hours: Organisation and production: Function analysis, automation, network
70 hours: Psycho-sociology, information and communication management, employee motivation, written and verbal communication techniques, foreign languages
70 hours: Economics, administration and control

150 hours of project work with the objective of professionally applying the theoretical knowledge in a company of one's choice.

13 weeks of practical training should be completed in a medium sized business: food industry, chemistry, metal processing.... etc

The examination procedure is the same as the examination procedure at universities.

ad. 9.7.2) Further training

Example: Further training university/private sector :

Quality Management
Quality, Environment, Safety

Donau University Krems
Abteilung für Telekommunikation, Information und Medien
Dr. Karl Dorrek Straße 30
A- 3500 Krems
http://www.donau-uni.ac.at

The Donau University Krems is state university, however it is run privately and commercially.
The post-graduate further training course is conceived for persons who practise a regular professional activity.

„Quality Management" is a comprehensive, future and application oriented training in total quality management and integrated management systems. Imparting knowledge for shaping and further development of processes, which lead to better company performance.

- EOQ – European Quality Manager
- E.F.Q.M. - Model for Business Excellence of the European Quality Award (EQA)
- ISO 9000 – 2000 the new international Quality Management guidelines
- KAIZAN – Japanese principle of continual improvement

The course concludes with the title „Master“ which is comparable with American universities. A detailed description of the course can be found in the Austrian report chapter.....

Example: Further training university sector:

Encadrement de Proximitè[89]

Framework of work
Individual advice

Institut Universitaire de Technologie
10 rue Jean Zay
56325 Lorient cedex, France

Foreword: This course focuses on the optimisation of business processes

Objectives:
The course is aimed at top-level managers who wish to improve their professional activities. The course consists of a theoretical and a practical part.

Course objectives: Assuming a manager's role:
- Organisation
- Production
- Instruction and distribution of skills
- Information management
- Employee motivation
- Control

Course elements
- Employee management
- Improvement of performance in daily work situations
- Business culture in the trilogy Client / Product / Process
- Economics, social rights, safety and quality

Course organisation:
- 12 months
- 455 course hours consisting of 44 days at the course institute and 21 days at a business firm

The course prepares future managers for work in SME's and large businesses.

89 The documents were kindly provided by the course institute.

Enrolment prerequisites:
A-Levels (or equivalent) and 5 years of work experience

Degree:
- Internationally acknowledged accreditation
- University diploma

Course program:

Module 1: Management
Duration: 17 days
Identification of communication principles in daily professional life.
To get to know oneself and others: Discovery of own potential, communication schemes, interpretation, facts and opinions, question techniques, work allocation, telephone training, negotiation techniques,
Team motivation: Encouragement, project management and meetings management, conflict negotiation

Module 2: Business organisation
Duration: 8 days
Preparation and organisation: Action processes, production organisation, typology of production, leadership models, technical data collection, creation of identification numbers, planning and order, index of quality and statistics, resource optimisation, logistics

Module 3: Improvement
Duration 7 days
Key of improvement: economic and social, individual and collective, challenge of change (Change management)
Methodology of diagnosis and problem solving: Identification and analysis, causal analysis, observation, reflection, decision, action and control, client and supplier relationship, team motivation

Module 4: Trilogy Client- Product- Process
Duration 2 days
External and internal clients, business image, understanding client's needs, negotiation

Module 5: Economics and social rights
Duration: 6 days
Business structure, documentation, expense control, bookkeeping, profitability calculations

Module 6: Safety and quality
Duration: 4 days
Safety regulation, employment rights, fire prevention, quality and environment management, product certification, environment regulations, control

Business practical training:
Preparation of a business handbook.

Pedagogic methods:
The course is tailored to meet the needs of businesses and students. Methods: practical work, theory lessons, case studies, case simulation.

10 External Evaluation

Sécurité, Environnement, Qualité

Vers l'intégration des contraintes dans une stratégie de développement.

La formation et l'Europe sont de rudes écoles. Le projet SEQUI a pris le risque se s'y soumettre en proposant à des formateurs et à des entreprises de différents pays de confronter leurs attentes et leurs expériences sur trois approches de la gestion des risques : les problèmes de sécurité, la protection de l'environnement et la gestion de la qualité.

Mettre à nu ses formations c'est s'obliger à dévoiler sa conception de la problématique, à définir sa cible, à préciser ses objectifs, à évaluer ses résultats. Ouvrir sa réflexion à l'Europe, c'est accepter que l'on puisse avoir une perception tronquée des réalités, que l'on ait pu manquer d'imagination pour construire des démarches innovantes. Mais c'est aussi prendre le temps de faire le point sur son action et profiter du dynamisme d'un partenariat ouvert pour reconsidérer ses démarches et construire de nouveaux projets sur des bases mieux assurées.

Par bien des aspects, le projet SEQUI s'apparente à un processus social d'apprentissage ou de formation mutuelle qui a vu l'ensemble des partenaires évoluer progressivement, d'une démarche d'intégration des contraintes liées à la gestion des risques vers une stratégie active de développement des entreprises et des groupes sociaux.

Il est intéressant, et sans doute utile, de souligner les trois étapes qui ont marqué ce processus.

Le regroupement de contraintes additionnelles.

Dans chacun des domaines considérés par le projet, l'approche est d'abord défensive. Elle est abordée en termes de contraintes (dispositions volontaires ou imposées) pour réduire les risques auxquels l'activité des entreprises soumet les personnes, les biens, l'environnement, et, s'il y a lieu, pour réparer les effets ou indemniser les victimes.

Dans ce contexte, les obligations, exprimées par les normes ou la réglementation, sont la référence principale. S'y ajoute cependant la technicité, propre à chacun des domaines, qui permet d'apprécier le risque, de travailler à le réduire et, s'il y a lieu, d'en limiter notablement les effets dommageables.

Il est alors logique de considérer séparément chaque domaine pour traiter de la réglementation qui s'y rapporte et acquérir les connaissances et savoir-faire techniques spécifiques au domaine.

Le risque masque une réalité virtuelle. Tant qu'il n'a pas produit ses effets, on espère y échapper ou s'en tirer à moindre mal. De nombreuses entreprises ont tardé à adhérer à cette vision défensive du risque. Lorsqu'elles s'y sont résigné, elles ont cherché à en réduire les

coûts en confiant le problème, en plus, à l'un de leur collaborateurs, puis, lorsque la charge devenait trop lourde, en engageant un nouveau collaborateur spécialisé dans la gestion des risques.

Le rapprochement QSE (Quality – Safety – Environment) trouve sa source dans cette gestion « à l'économie ». Puisqu'il faut quelqu'un pour gérer les risques, autant qu'il les prennent tous en charge. Solution d'autant plus logique que, le souci majeur étant d'éviter les traquenards de la réglementation, le moyen le plus sûr semble être de concentrer la responsabilité sur une personne avertie dans ce domaine.

L'intégration de savoir-faire transversaux.

Le rapprochement QSE opéré dans ce contexte, avec des dominantes sur l'un ou l'autre des pôles selon les sensibilités et/ou les savoir-faire des organismes de formation, on en vient naturellement à se demander s'il n'est pas possible de mettre un peu de cohérence dans cette juxtaposition, voire de gagner en efficacité en imaginant des troncs communs.

Cet exercice conduit généralement les formateurs à découvrir que leur enseignement précédent faisait hardiment l'impasse sur l'acquisition de savoir-faire indispensables, par exemple l'analyse systémique ou l'animation du changement. Il les conduit aussi à restructurer des enseignements, par exemple pour poser plus solidement les bases juridiques nécessaires à la compréhension et au suivi des dispositions réglementaires.

Dans le même temps, l'enseignement précédemment organisé autour des contenus, tend à se centrer sur les personnes et donc sur la nouvelle fonction en train d'émerger. D'où les réflexions sur les niveaux de responsabilités, les pré-requis, le sens de la mission confiée aux personnes à former.

L'enjeu stratégique du développement.

L'intégration progressive des missions QSE dans une fonction identifiée dans l'entreprise conduit nécessairement à préciser l'apport de cette fonction au projet global de l'entreprise.

Ce passage est déterminant car il propulse les missions QSE d'un statut technique de prise en charge de contraintes à une fonction stratégique pour la mise en œuvre du projet de l'entreprise.

Il est intéressant de noter que cette évolution s'opère au moment où la réflexion des qualiticiens sur les normes ISO 9000, élaborées pour la maîtrise des processus, les conduit à concevoir une nouvelle norme ISO qui intègre toute la démarche qualité dans la logique de la stratégie d'entreprise.

Lorsque l'entreprise s'organise pour répondre aux attentes explicites et implicites de ses clients elle doit bien entendu, en premier lieu, veiller à ne pas nuire et si possible à favoriser, d'abord ses besoins fondamentaux et notamment la sécurité, ses besoins fonctionnels par la qualité des services et produits proposés, mais aussi de confort, d'agrément et de santé à terme, par le respect de l'environnement.

Pour réaliser ce projet, elle doit veiller à anticiper et à disposer en permanence des ressources nécessaires. A cet effet, la nouvelle norme développe des exigences particulières au niveau de la gestion des ressources humaines, du management, des compétences du personnel bien sûr,

mais aussi des conditions de santé, de sécurité et de confort qui viendront créer, pour les salariés, un environnement de travail favorable à la maîtrise de la qualité.

Cette approche globale marque ainsi, pour l'ensemble des domaines QSE, une véritable rupture par rapport aux pratiques antérieures. Des pratiques défensives éclatées dictées par les contraintes, l'entreprise est invitée à passer à des actions dynamiques, volontaires et convergentes pour réaliser ses objectifs.

Pour les formateurs, un nouvel enjeu s'annonce. Certes les contenus précédemment proposés gardent leur pertinence, à condition toutefois qu'ils s'inscrivent désormais comme moyens d'atteindre le projet de l'entreprise. Et comme ce projet est par définition collectif, la fonction QSE devient un challenge qui concerne tout le monde, pas seulement les personnes spécifiquement formées à cet effet.

A Nantes le 20 juillet 2000

Roger BALCON

Directeur de la Formation
et du Développement
des Ressources Humaines

CRCI des Pays de la Loire.

DRAFT

We all know that the environment is a complex system, that safety is a complex problem (not even to mention quality), but this appraisal seldom gives rise to adequate actions. In particular, the culture which lies behind so many interventions is still highly mechanistic, too severely affected by old-fashioned thinking styles. Of course, mechanistic reasoning, linear cause-effect chains can be very effective, but it is well known that common-sense reasoning, while often effective, can lead to gross mistakes and dangerous consequences. This is particularly true in the case of complicated socio-technical systems, which often display counterintuitive behaviours.

The science of complex systems provides very useful intellectual tools to deal with such systems, and it should be incorporated in the training of the experts in managing environment, safety and quality, therefore in the Sequi training. The main contributions which can be provided by this study are

- Removal of old mental habits, like e.g. the supposed proportionality between cause and effects; many examples can be shown where small changes are amplified by the system nonlinearities, leading to macroscopic consequences.
- Development of the capability to "see" and appraise phenomena which sometimes pass unnoticed, like e.g. the self-organisation properties of most of these systems (self-organisation would rather be perceived as disturbing noise in a mechanistic paradigm)
- Understanding of novel and powerful concepts to analyse the behaviours of these systems; a recent example of these concepts is the suggestion that adaptive evolving systems, like companies, tend to reach a regime which lies "at the edge of chaos", i.e. in a region of parameter space which is intermediate between an ordered one and a fully chaotic one. This region should provide an optimal trade-off between flexibility and repeatability, between novelty and tradition.

Last but not least, complexity science is strongly interdisciplinary, as well as life, environmental protection, safety, quality, and all that. And it helps us to realise that disciplines are just useful categorisations which must never become barriers to real understanding.

In order to achieve an effective understanding of these aspects, theoretical lessons should be complemented by seminars and exercises directly related to the fields of interest of the trainees, or to their organisations. Examples of interesting topics which can be dealt with include the analysis of how large industrial accidents take place, the simulation of their large scale effects, the study of spontaneous informal organisations within companies, the analysis of health risks associated to environmental pollution, etc.

Milano, 26/09/2000

Prof. Dr. Roberto Serra

Director of Centro Ricerche Ambientali
MONTECATINI

S E Q U I P a r t n e r s h i p

A.F.Forum
It is a non profit association, constituted by universities, research bodies, training institutions, public authorities, private institutions and state owned enterprises. It was created in 1987 to integrate the competencies of various organisations and individuals offering and requiring high level education and training, and to support the development of innovation in technology, organisation and management, social and cultural fields. A. F. Forum`s mission is to intervene in educational systems, in innovation and technological transfer, and in permanent training, post-degree training, university training and post-diploma training.

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CRCI (Chambre Régionale de Commerce et d'Industrie des Pays de la Loire)
The Regional Chamber of Commerce and Industry of the Pays de la Loire Region, with the 8 local Chambers of Commerce and Industry, as a public institution managed by businessmen, is in charge of the economic regional development. Along with the CCI, the CRCI offers a wide range of services to the companies (about 80000) in training and human resources, business management, international trade, innovation technologies.
In that context, the proper job of the Training and Human Resources Development Department is to identify and anticipate competencies needs of regional companies and to fit them with training opportunities along with regional political and academic authorities and training organisations.

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CSI Centre for Social Innovation
CSI is a non-profit, private research institute, albeit acting on contract as a co-operating department of the Universitaet fuer Bodenkultur (BOKU, University of Agricultural Sciences and Renewable Resources, Vienna). Research is the basis for work in the areas of networking activities, training, policy consulting, and the organisation of conferences and workshops. Since its foundation in 1990, work is organised interdisciplinary and situated extensively within international networks - aiming at improving modern society's social performance to cope with its outstanding industrial and technological potentials. European issues play an important role in the work of the CSI, emphasising particularly on provisions necessary for the improvement of the relationship between the European Union (EU) and Central and Eastern European Countries (CEEC). CSI has been involved in a diversity of European projects (e.g. ACTS, ADAPT and EMPLOYMENT, LEONARDO DA VINCI, etc.)
Core competencies of the 25 regular employees are in Labour Market, Education and Training, European Research and Technology Development Policies, Environmental Issues.

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FACTUM
is an SME located in Vienna, the capital of Austria. It conducts both basic and applied research, and it assists various customers in connection with the implementation of research results.
Personnel: 2 owners (both with doctor's degrees, one of them Ass. Prof. of University of Vienna) and 6 employees (one with doctor's degree and one master of science); a varying number of freelance Partners. The main work area of FACTUM is traffic. The central scientific topic is the development of methods to communicate adequately with different target groups. All this is based on work on attitude- and acceptance matters, motive- and communication research ("marketing") and on behaviour observation and description methods. The results provided by FACTUM´s work are regularly disseminated as journal articles and reports, and yearly reports are issued, mostly published by project sponsors.

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Montecatini Environment Research Centre
The Environmental Research Centre (Centro Ricerche Ambientali - CRA) is a research facility of Montecatini S.p.A., a company of the Montedison Group (one of the largest Italian private industrial groups) which manages chemical, agro-industry, engineering and energy companies. The Environmental Research Centre, which is the corporate focal point for scientific, technological and didactic activity of the Montedison Group in the environmental research field, was established in January 1993 with the mission of developing basic and applied environmental research. The Centre was born out of an agreement among Montecatini, the University of Bologna, which holds in Ravenna its courses in Environmental Sciences, and the Ravenna's municipality. Besides its industrial mission, the Centre also supports didactic and research activities of the University thus providing an example of effective partnership among industry, university and local government.

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SITIA :

The Advanced Technological and Industrial Innovation Company (SITIA : Société d'Innovations Technologiques et Industrielles Avancées) is an engineering company in the field of automatic control and industrial software development. This limited company, created in 1986, has a capital of 200 000 Euro. SITIA is a subsidiary of the Ecole Centrale de Nantes which holds around 35% of its capital. SITIA therefore plays an important role as an interface between research and industry. In this capacity, SITIA has been involved as a co-ordinator or partner in numerous European Research or training programmes. SITIA is involved in four different industrial sectors. These are : naval construction, especially French Navy, the aeronautical industry, the automotive industry and the mineral industry. In each of these areas, SITIA, through its experience, possesses "trade" skills which allows it to determine the needs of its clients and to develop or propose services adapted to these demands.

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Im Auftrag der Europäischen Kommission, DGXII , Programm Leonardo da Vinci, wir im Rahmen eines Pilotprojektes Vorschläge von Curricula für Generic-Manager und Generic-Consulter erarbeitet. Die Curricula sollen zur Weiterbildung bereits tätiger und zur Ausbildung zukünftiger Generic-Manager und –Consulter mit Schwerpunkt auf Intergration der drei Bereiche dienen.

Vor dem Hintergrund der in Betrieben bislang parallel geführten Sicherheits-, Qualitäts- und Umweltmanagementsystem wurde in einem Konsortium von ForscherInnen aus Italien, Frankreich und Österreich Recherchen zu bestehenden Bildungsangeboten, Fragebogen-erhebungen zur Identifizierung des neuen Berufsprofils, sowie mittels Fallstudien Erwartungen an den hierzu zu kreiierenden Bildungssektor durchgeführt.

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