



Education and Culture

Leonardo da Vinci

**Risk prevention and health protection in adult
education**

EDFORSA – Education for safety

**National report on occupational health
and safety education in Germany**

closing date: 30th of November 2003

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1 The legal frame of OHS in Germany

1.1 Federalism, dualism and laws

Generally, it has to be said that there is no coherent principle of OHS education in Germany except some single trainings. Because Germany is based on the principles of federation and dualism there is not only one entity that generates and decides. The federal ministries and the federal state ministries are included in the process of creating OHS education and they are included with different competencies. Because of this variety we can only give a very short, rough and simple overview in this report. Therefore we will not speak about special exceptions and particular cases and situations.

OHS in Germany is mainly based on three laws:

- Workers' Protection Law (Arbeitsschutzgesetz ArbSchG) (This law contains rights and duties of employers and employees concerning working safety.)
- Occupational Safety Law (Arbeitssicherheitsgesetz ASiG) (This law is about the employment of company physicians and safety professionals.)
- Social Law Book VII (Sozialgesetzbuch VII SGB VII) (This law book is about legal accident insurance of employees, trainees, pupils etc., about prevention and rehabilitation.)

These laws deal with all kind of situations that have to do with OHS. Furthermore the working safety system in Germany is based on two entities that deal with OHS: the responsible ministries of the federal government and the federal states and the Statutory Accident Insurers (Unfallversicherungsträger UVT).

For this national report the base will be the work of the statutory UVT, especially the work of the Professional Associations (Berufsgenossenschaften BG).

1.2 The function and work of the BGs

Every company, enterprise etc. has the duty to insure their employees at a BG. There are 35 different BGs existing in Germany. Every BG is responsible for a special working field, e.g. the Metal-BG or the Mining-BG. By paying this compulsory insurance the employee is insured in case of working accidents and occupational diseases. By the SGB VII the BGs have the duty to provide (further) education for people who have to deal with safety at work. But it is not a duty of these people to take part in those educations. Furthermore the BGs have the job to do everything that is possible to prevent working accidents, occupational diseases and work related health dangers. So the BGs provide a wide range of knowledge about OHS, they monitor the realisation of OHS aspects in the several companies and they provide a variety of education concerning OHS.

2 OHS education

2.1 OHS education at school

Generally, it has to be said, that there is no coherent way of OHS education at German schools. Mostly it depends on the teachers and on the subject they teach what they are going to teach their pupils about OHS. Besides that there are a lot of norms and technical standards that have to be realised for the safety of pupils e.g. the Prevention Of Accidents Regulation For Schools (Communal Accident Insurance Gemeindeunfallversicherung GUV V S1 (2001)).

Furthermore schools are a subject of the ArbSchG, the ASiG and the SGB VII § 2 no.7. Especially the last one is very important because by it pupils are insured during their stay at school, on their way to and from school and as long as they are involved in school activities (such as journeys etc.). As OHS is no general part of the curriculum, there are diverse programs and projects of the several federal states of Germany but it depends on the schools and on the decisions of their staff if they participate in those activities.

2.1.1 OHS education at elementary and secondary schools

In this school types OHS education is focused on general health education. That means the pupils learn the basics of health and hygienic living and of environmentally conscious acting. Informed by special “teacher letters” the teachers have the chance to bring in OHS topics that are related with their subject. Several subjects as chemistry and sports are related with special safety instructions, that have to be given by the teachers before the pupils start to work. In elementary schools there is also a focus on traffic instruction.

2.1.2 OHS education at grammar schools

Besides all the aspects explained in the chapter above OHS education can be widened in grammar schools. If this happens it is mostly a part of the subject called social studies or politics where the teacher also speaks about the legal background.

2.1.3 OHS education at vocational schools

As at the previous introduced school types at vocational schools there also does not exist a coherent curriculum for OHS education. And at this school type more than at the others it depends on the federal states what is taught in class.

There are several possible ways, we give two examples to show the difference.

In Saxony it was tried to involve OHS in the curriculum of Saxon's vocational schools. But this idea conflicted with several laws so that in the end OHS is no separate subject at the moment. The teachers at vocational schools are required to take part in workshops held by the Saxon Federal Institute Of Working Safety And Occupational Medicine to get informed about OHS. This so obtained knowledge they are to integrate in their teaching. The participation in this workshops is optional. Further on teachers are backed by "teachers letters".

In Bavaria there is a travelling exhibition combined with practical teaching units concerning special risks of accident and specific tasks of working safety concerning their work station and future employment. This way of "travelling and teaching" is backed by the Bavarian Administrative Office For Working Safety, Occupational Medicine And Safety Techniques and exists since 1961. By travelling around it is tried to reach as many pupils as possible. The exhibition is spontaneously integrated in the curriculum and takes 20 lessons.

These two examples show how different the way of teaching OHS can be but it does not hide, that there is no coherent way of teaching in Germany and that a coherent way is needed. But for the nearer future there is nothing to be seen concerning the integration of OHS in all curricula of all federal states of Germany and especially no coherent way of teaching OHS.

2.2 OHS education at universities and academies

At German universities and academies exists no coherent curriculum for OHS education as well. It varies from university to university. Even the federal states have no influence on the subjects taught. A recent survey of the Technical University Dresden (Technische Universität Dresden TUD) shows how

different OHS education is realised within the several universities. Therefore we can only give a small insight into this complex topic. Mostly OHS is a part of several diploma study courses. Only a few are complete OHS studies e.g. the chartered engineer for safety engineering at the Bergische Universität Gesamthochschule Wuppertal or at the Technical Academy Berlin (Technische Fachhochschule Berlin TUB) and the chartered engineer for labour organisation at the Technical University Dresden. Very often OHS education is a part of the following branches of study: traffic and transport system, mechanical engineering, logistics, business management and economics, management of technology and process engineering. The main branch of study is mechanical engineering. Mostly it is the basic study period for safety engineering related studies. Later on these chartered engineers can work in the fields of work preparation, product design, work place design, executive production, inspection and supervision.

2.3 Curricular education for adults

In Germany there are two main curricular OHS educations for adults - the safety professional (Sicherheitsfachkraft Sifa) and the First-Aid (Ersthelfer).

2.3.1 The safety professional (Sicherheitsfachkraft Sifa)

Besides all the experts educated at universities and the company physician the Sifa is the only state-approved expert of OHS in Germany. Its job is based on the three laws named in chapter I especially on ASiG § 5 et sqq. By the ASiG the safety supervision and consultation of enterprises by Sifas is oblique. Mostly the Sifa is a normal employee of the enterprise, but because of a further education he is also able to fulfil the tasks of the Sifa. In bigger enterprises it mostly is a fulltime job. The major tasks of the Sifa are to advise and to support the employer

on every question of OHS. Because this is a very demanding and difficult job, there is a job specification for the Sifa education. The trainee has to have a qualification as engineer or technician and he needs to have at least a two years working experience. The education exists as a blended learning system and consists of several parts like presence learning, CBT-self-studies and one placement. This system of learning is explained in detail in chapter 8.1. The education of the Sifa is based on a curriculum created by the BGs that is coherent throughout Germany and can only be provided by state-approved institutions. The financing of this education depends on the BGs and the employers. If an enterprise is insured by a BG that provides this education within his service than it is free. Otherwise the employer has to pay. Anually approximately 4000 people are trained as Sifas.

2.3.2 The First-Aid

By the laws named in Chapter 1 (esp. ArbSchG §10) every employer has the duty to provide first aid. Besides several medical and technical facilities he also has to have a First-Aid within his employees. The number of First-Aids in an enterprise depends on the number of employees (Professional Association Instruction Berufsgenossenschaftliche Vorschrift BGV A5 “Erste Hilfe” § 6). The First-Aid is a normal employee of the enterprise but besides his vocational or job related education he also has an education in first aid. Every employee can be asked to become a First-Aid. It is his duty to accept the offer except if he has personal reasons to decline it. The major tasks of the First-Aid are to initiate immediate measures in case of an accident, to call for help and to prevent further danger from the accident victim. Thereby psychological attendance plays an important role. Furthermore the First-Aid prepares the rescue of the injured by professional medicals. For to be able to fulfil all these tasks, First-Aids need a special education provided by

German accredited First Aid Organisations, e.g. The Red Cross. The education consists of several parts. The basic training on first aid aspects lasts 8 double lessons (à 90 minutes). Every two years the First-Aid has to take part in a further education that lasts 4 double lessons. The education is financed by the BGs and based on a curriculum created by the BGs that is coherent throughout Germany. Nowadays approximately 2 millions of people are yearly trained as First-Aid.

2.3.3 Other curricular educations

In Germany there are any more curricular OHS educations for adults. They shall be mentioned but not explained in detail because they are too specific.

The technical supervisor (Technischer Aufsichtsbeamter TAB) is trained by the BGs and later on one of their employees. He visits the several enterprises by direction of its BG and monitors, if the aspects of OHS are realised. This education lasts two years and is BG internal. On the level of the federal states exists an equal education for the so called factory department supervisor (Gewerbeaufsichtsbeamter).

2.4 Extracurricular education for adults

Besides all this curricular education there is a variety of extracurricular offers concerning OHS education.

- The biggest provider are the BGs, it is their duty to provide OHS education (see chapter 1.2). The teaching methods used in the initial and further training schemes of the BGs are tailored to adult needs. They incite the active participation of the participants and make use of practical exercises on machinery, equipment and other objects relevant to occupational health and safety¹.

¹ As an example see www.bgag-seminare.de.

These methods are supported by the use of modern media such as interactive teaching programmes. Participant-oriented seminars are aimed at employers, managers, employees representatives, OHS experts, safety delegates, manufacturers, purchasers and various other professional groups such as crane drivers, welders, radiation protection delegates etc.

- On federal and federal state level OHS education is provided by several institutes like the Federal Institute For Occupational Health And Safety (Bundesanstalt für Arbeitsschutz und Arbeitsmedizin BauA) or the several ministries (in Saxony it is the Saxony State Ministry For Economic Affairs And Labour).
- A very important provider is The German Road Safety Council (Deutscher Verkehrssicherheitsrat DVR). Objective of this Organisation is the support of the measures aimed to improve traffic safety of all road users. Main emphasis is given to questions related to engineering, education, legislation and enforcement. This council provides all kinds of training and education concerning correct acting in road traffic for all people.
- Furthermore there are a lot of private providers like the Technical Inspection Agency (Technischer Überwachungsverein TÜV) or the Technical Akademie Esslingen. They also provide OHS education and it depends on the customer which training centre he prefers and what accreditation he or the education requires.

Generally, it has to be said that OHS education is a product, it is sold and so aspects as prices or personal preferences are a matter of choice. But in the end it depends on the employer whether he sends his employees to further educations or not. One problem the employer has is, that his employee is taken out of the

running operating process. But maybe this problem can be solved by more and more introducing e-learning.

2.5 Compulsory OHS education for employees within an enterprise

By the ArbSchG § 12 the employer has to inform his employees sufficiently about safety at work and health protection. He has to do this if he hires a new employee, if there are changes in the working area, if he is introducing new techniques or technology. These safety at work information have to be up-to-date and have to be repeated regularly.

3 Educational forms of OHS

OHS education whether curricular or extracurricular is mostly provided by presence learning in classical forms.

3.1 Classical forms

In terms of teaching pupils it happens by attending classes. It varies at universities where students have the possibility to take part in workshops, day seminars, weekend seminars and distance learning. For adult education federal wide or state wide seminars and workshops are the common forms.

3.2 Forms of e-learning

Although education nowadays is still mostly provided by presence learning there are some fields (e.g. learning languages, further education of employees, content management) where e-learning is used. But besides that it has to be said that e-learning is still at its beginning. Analyses show that the reaction of the

market concerning this new way of learning and teaching did not meet the expectations. E-learning is provided as:

CBT - Computer-Based-Training

- The user works in self-study with the material that is provided only by the software and handbooks. The computer replaces the tutor or teacher. It controls, steers and monitors the learning process. CBT is an offline learning offer.

WBT - Web-Based-Training

- This is an internet supported form of distance learning with or without the assistance of tutors.

VC - Virtual Classroom

- In Germany it is only known and used in the way of forums and in some very specific cases as the Distance University Hagen (Fernuniversität Hagen)².

3.3 Definition of e-learning

With the upcoming new education form a vast number of explanations of the conception of e-learning flooded the market. Since last summer a team of BG specialists is working on a project concerning the use of e-learning in BG education. Within this project a definition of e-learning was made which will be binding for all e-learning products of the BGs. It says that,

“e-learning is a form of learning supported by an electronic medium. It is a combination of

- multimedia (e.g. animation and simulation) and
- interaction (communication among the learners and/or the tutor).”

² For further information please visit: www.fernuni-hagen.de.

In this case maybe it would be better to speak of “e-interactive-education”. This education is computer and/or web based.

Analyses show that CBT is not very successful (e.g. language courses on CD-ROM). The results are very unsatisfying because most of the learners are not ambitious enough in self studying. Other problems are the software and the missing support concerning the use of it and while dealing with problems. E-interactive-education is more successful but still the motivation of the learner is a problem. A possibility that solves most of the problems is “blended learning” (BL) - a combination of e-learning and presence learning. It is the most successful way of teaching that is supported by an electronic medium. It is favoured within the BGs and the Sifa education is based on it.

3.4 E-learning based OHS education

There is a big interest of e-learning-producers to widen their range of products by including OHS education, but at the moment this process is still at its beginning. But the product range already reaches from operating machines to accident prevention. Providers offer OHS e-learning mostly as CBT but with different success. The main problem is that sound standing knowledge of OHS is needed to create e-learning products. That implies that a standard and/or certification is needed to assure that the provided knowledge is correct. At the moment there is no such standard in Germany. And so some products are developed in cooperation with ministries, BGs or universities but some are not.

Some products and providers:

product and <i>system</i>	provider and <i>co-operator</i>
Sifa education. <i>BL</i>	Federal Institute of Occupational Safety and Health (BAUA), Central Federation of the BGs (HVBG)
OHS in SMEs. <i>WBT</i>	pragmagus, <i>Federal Ministry of Education and Research, BGs</i>
Working safety for trainees. <i>CBT</i>	Christiansen-publisher, <i>construction work-BG</i>
Operating a fork lift. <i>CBT</i>	VR@work, <i>several BGs</i>
risk assessment. <i>CBT</i>	Retail-BG
Stress prevention for drivers of busses and trams. <i>CBT</i>	Railway-BG
Ergonomics at the office. <i>CBT</i>	Administration-BG
Safe working at laboratories. <i>CBT</i>	Chemistry-BG
The handling of scrap metal. <i>CBT</i>	Non-commercial training and employment society Offenbach

This table only presents a choice but it shows how wide the product range of OHS related e-education already is, and that mostly the BGs are involved in the creation. But the most important one is the Sifa education that will be explained in detail in the annex.

4 Quality ensuring of OHS education

4.1 Preparation of teachers and their follow up education

As already mentioned the preparation and follow up education of school teachers depends on the federal states and on the teachers own decision. They are also supported by “teachers letters” and handbooks compiled by the statutory UVTs. For universities and curricular OHS education there are special guidelines but they are different for each entity.

4.2 Tutor's/teacher's training concerning extracurricular OHS education

Because adult education is very complex and difficult it is vital to have excellent trained tutors. The Institute Occupational Health And Safety (Berufsgenossenschaftliches Institut Arbeit und Gesundheit BGAG), the biggest education-centre for OHS tutors, is known for its successful training of teachers and tutors. Annually 600 people are visiting the workshops and courses of the BGAG. Topics are³: basics for tutors, innovative methods, management of education, qualification of operational and interplant instructors, communication and rhetoric, multimedia and intercultural training in OHS. The tutor is the key to the trainee. It depends on him if a trainee understands a subject and if he adopts it. By evaluation the BGAG tries to optimise its product range for to be as satisfying as possible.

4.3 Knowledge certification and institutions of accreditation

Because in Germany the education is based on laws, there are only two entities who have the right to accredit education centres and certificates. Those two entities are the state and the federal states. As already explained, their jurisdiction is different. For school teachers and their possibilities of (further) education it is the particular federal state. At universities it is the federal state as well but its instructions are liable to the decisions of the several universities. In Germany in case of education exists the principle of, "University sovereignty stands above federal state sovereignty." For curricular adult education, especially the Sifa and the First-Aid education, the certification is state-approved, and so the education centres have to be state-approved as well. The tutors of these educations also have to be state-approved. Certification of extracurricular education

³ For detailed information please visit: www.bgag-seminare.de.

happens by special certificates of the education providers. Whether those certificates are state- or federal state-approved depends on the subject of education and resulting, if the education centre has the authorisation to accredit.

5 Technical equipment of SMEs concerning communication and obtaining of information

The information given in this chapter is based on a research⁴ done by the Federal Statistical Office Germany (Statistisches Bundesamt) of the year 2002. Within this research 1.2 millions of German companies have been surveyed. Although it is not up-to-date it shows the development and the progress of SMEs regarding the subject. 68% of all German small-sized businesses and nearly 100% of all German medium-sized businesses use computers. Approx. 60% of them use the possibilities of the internet. And even the intranet is of interest even for small-sized businesses. In 2002 28% of the small-sized businesses and 73% of the medium-sized businesses were present on the internet by their own homepages. According to these results, the existence of technical equipment concerning communication and multimedia is beyond all question.

6 Possibilities of use of e-education in SMEs – current state and future outlook

As the chapter above shows, nowadays it is no problem to use the facilities of e-education. When we say no problem than it means it is no technical problem. But there is another one. It has to do with the main reasons of developing e-education. Education needs time. An employee has to be sent away for obtaining knowledge. As explained in chapter 3, OHS education

⁴ This research can be found at:
http://www.destatis.de/allg/d/veroe/d_blickpkt.htm#Informationstechnologie.

mostly is taught in classical forms as seminars or workshops. Especially for SMEs it is difficult to send an employee to such educations because during that time the enterprise is missing a labour. So e-education was developed as a form of distance learning. In Germany especially the Sifa education benefits of it because the complete education lasts 8 weeks. And which employer can afford to send an employee away for that long time? A second point is, that the employee has the chance to adopt the learned immediately to his enterprise and working situation. But the problem is, that this form of education needs time as well. But now the trainee remains within the enterprise and only little time is given for learning and obtaining knowledge. That means the learning process is not integrated within the working day of an employee. Mostly he has to do it as “homework” an of course mostly at home. Bigger enterprises such as banks have the possibility to integrate that learning process within the working day. One example is the German Volksbank. As a little excuse: Their employees now have special doorplates saying “Don’t disturb I’m learning!”. But this is a real big enterprise and an exception. For to make e-learning more attractive for the learners it has to be integrated in the working day, but maybe for that step a major decision within the agreement on tariffs or job description will be needed.

But besides that, e-learning within the SMEs is already successful. E.g. the work of Pragmagus⁵ a WBT for SMEs concerning OHS is regarded very well, and the number of visitors is increasing. There is a demand for OHS education that is provided in a simple but effective way. So e-education is definitely a way, as long as it is presented in an efficient way and as long as the learner gets all the support he wants and needs.

⁵ For detailed information please visit: www.pragmagus.de

7 Résumé

Concerning all the information given in the chapters above it is out of question that education in OHS is needed, and that it has to be provided in an uncomplicated form. We think a CBT based OHS education has two main advantages. Firstly, it will help to spread the idea and knowledge of OHS better than by teaching it the classical way. By distributing a CD-ROM no classroom or teacher is needed and no time-consuming seminars or workshops need to be held. Flexibility, one of the great demands of our time, is guaranteed, and by that quantity - the possibility of reaching many interested people- is guaranteed as well. Secondly, by providing OHS knowledge on a certain level and by this media, we have a chance to close the gap that is between OHS specialists and non-specialists. E.g. small-sized businesses, where no Sifa is requested, will have a chance to educate their own safety personnel recruited within its own staff. But not only the business world will benefit from this OHS education. We think there is a possibility to spread this education throughout all areas of daily life. E.g. in schools or kindergartens, where we have a lack of OHS knowledge, this CBT might be useful.

8 Annex

8.1 The Sifa education

The former training concept for skilled labour in occupational safety/safety professionals, which was devised in the mid 1970s as a first step towards performing tasks in accordance with the Occupational Safety Law (ASiG), no longer met the current and future requirements of occupational safety at the workplace. Therefore the Federal Ministry Of Labour And Social Security, the Federal Institute For Occupational Safety And Health (BAuA) and the Central Federation Of The German BGs

(HVBG) jointly developed a new, forward-looking training concept for safety professionals. The training is carried out according to an education concept of the year 2001. Besides the practice-oriented transmission of up-to-date occupational safety and health concepts, this training scheme is also characterised by the fact that it is split in presence learning phases and self-study phases.

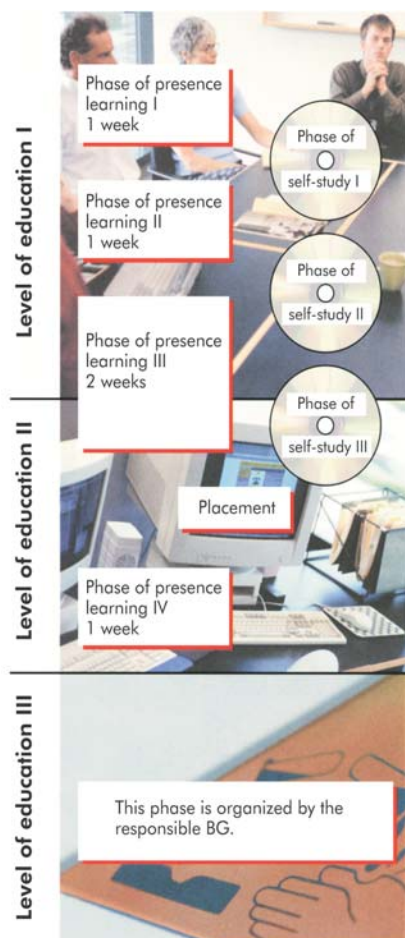
For a better understanding we would like to describe the Sifa education a little more detailed. For the entrance requirements see chapter 2.3.1.

The Sifa education consists of three phases:

level of education I

Within this level the tutors impart basic knowledge concerning technical, methodical and social skills. Therefore lessons have subjects like:

- introductory in safety and health care and the duties of the Sifa
- the basics of the development of accidents and occupational diseases
- the basic knowledge about factors of dangers and of health promotion
- legal basis of responsibilities and duties of the statutory UVTs



- identifying and analysing dangers
- basics in workplace design
- training of solution finding and decision making
- realisation and monitoring of safety at work and its measures
- basics in safety and health protection management

level of education II

This level deepens the knowledge obtained in level I and during the self-study by adopting to reality. Therefore extensive case studies are used. This level includes a placement, where the trainee is called to use its knowledge within its placement enterprise.

level of education III

This level is organized by the several BG the trainee belongs to. Based on level I and II the education is related to the special subjects and situations of the supervising BG.

For to obtain the state-approved Sifa certificate, four exams have to be passed, the first one after phase I, the second is an appraisal of its placement, the third one is a presentation of work results during the presence learning phase IV and the last one within education level III. The trainee has to pass an exam before he can enter the next level.

After passing all the education and the exams the trainee is a state-approved safety professional as requested by law (see chapter 4.3).

8.2 Additional information concerning module III led by the BGAG in cooperation with CIOP and Ppm - *the level of education concerning health protection and work hygiene*

By the Workers' Protection Law (ArbSchG) the employer has the duty to inform its employees about health protection and work hygiene. These instructions are tailored to the specific tasks of the several employees. For to fulfil the demands of the law this instructions should be of high quality. Especially § 5 is very important. It is about risk assessment. The employer has to assess every task an employee has to fulfil. Aspects of this risk assessment are:

- the ergonomic configuration of the work place
- physical, chemical and biological risks
- the configuration, choice and use of work equipment – esp. materials, machines and tools
- the configuration of operating processes and manufacturing processes, of process flow and work schedule
- the qualification of the several employee concerning its tasks

8.2.1 The level of health protection education

It is not easy to answer that point. For to evaluate the German education it would be of help, if there would be a definition of “level” concerning the EDFORSA project. But we can say that the level of our Sifa and First-Aid education fulfils the tasks of the laws. For every day life that means that we try to do everything to prevent danger. Resulting the education tries to match every part of life and to provide solutions for every situation. Our safety professionals shall be all-round man concerning safety and health protection. For education details please see chapter 8.1. But, it has to be said that besides this special education there is lack of competence and a big lack of information within the enterprises. The risk assessment explained in the chapter above has to be done by the employer

and not by the Sifa or First-Aid. So if an employer has no extra personnel to carry out this assessment, it is his job to do it but besides all other tasks he has to fulfil as an employer. So it is the question, if he will have the time to do it and if he will have enough time to do it. Another problem is the big lack of knowledge. Because of the difficulties we have concerning the risk assessment, it is very important that the normal employee and its department chief or floor manager knows what he can do for health protection. But what possibilities of informing himself does he have? It is all based on one's own initiative. So to support this initiative those people need all backing they can get. But very often information in an enterprise does not get where it was aimed at. Or although the BGs do a lot of work and provide a lot of help, it is never enough to satisfy the demand. So this EDFORSA-CBT could help to spread knowledge effectively and to satisfy this demand.

8.2.2 The level of work hygiene education

Nowadays work is integrated in the living process and so work has to be liveable. In terms of work hygiene the aim is to prevent long-term stress and work load, esp. concerning psychological stress resulting of the amount of work, physical stress, social stress within the staff etc. To sum it up the demands of work hygiene regard all aspects of work life balance. We can say that concerning this point a lot is done in Germany. Most reactions are sectoral and nearly every branch has its own way of supporting work hygiene. An example is the supervision of office assistants. For this occupational group e.g. a check list containing a lot of questions was developed. By these questions the office assistant can analyse whether his work place meets the physical and psychological demands of health and work regulations. So it is a kind of personal risk assessment. The aim of such check lists is to make work hygiene as personal as possible and to tailor it to every single employee. For the area

of work hygiene it can be said that, if the surrounding meets the expectations the job will be satisfying and the done work will be satisfying as well.