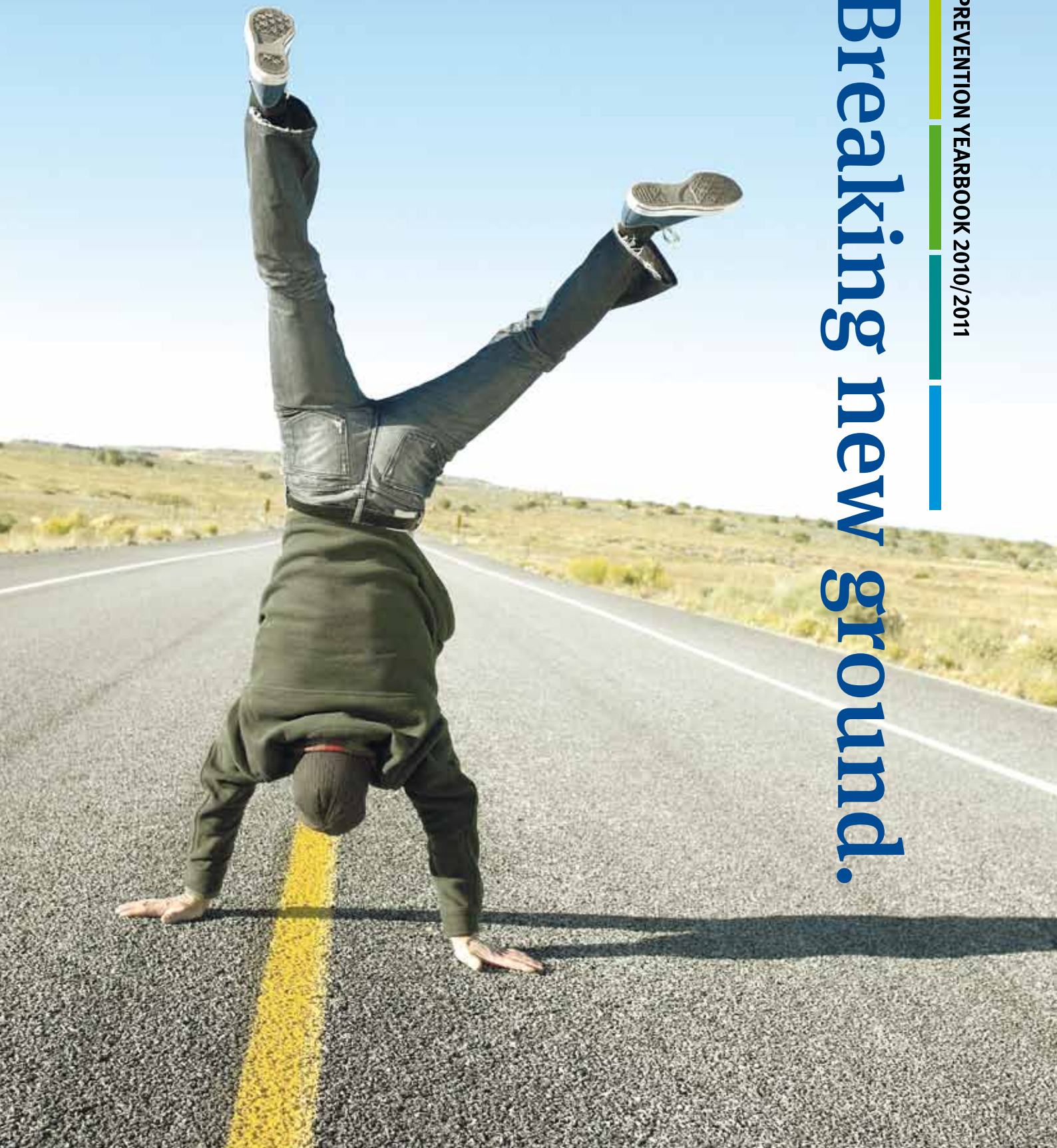


PREVENTION YEARBOOK 2010/2011

# Breaking new ground.





PREVENTION YEARBOOK 2010/2011



# Breaking new ground.



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# PREVE IS MORE THAN

## The colours of prevention

A world without colour would be a drab place. Colours add spice to life and influence our perception of our surroundings. Each colour has its own character and its own particular significance. The colours of prevention promise new life, energy and growth. And they show that behind modern occupational safety and health is a colourful world of equally modern approaches to health and safety at work, in schools, and in children's daycare facilities.



# EVOLUTION JUST A WORD

A PARADIGM SHIFT IN OCCUPATIONAL SAFETY AND HEALTH – CHANGES AND TRENDS

SOCIETAL AND PSYCHOSOCIAL ASPECTS

CHEMICAL, PHYSICAL AND BIOLOGICAL HAZARDS

EFFECTS OF ECONOMIC AND POLITICAL INFLUENCE



WORKPLACE HEALTH

CUSTOMER ACTIVATION

DEMOGRAPHIC CHANGE

VIOLENCE AT THE WORKPLACE

STRATEGIES GOOD AND

CARCINOGENIC SUBSTANCES

MOBILE

FIGHT THE RISK

STRESS SITUATION IN CHILDREN'S DAYCARE FACILITIES

SUPERVISION IN SMALL BUSINESSES

ERGONOMICS

STANDARDIZATION OF SERVICES

MOLECULAR



**MSD** KNOWLEDGE SOCIETY  
**MOBILE WORK**  
**SHIFT WORK** WORLD CONGRESS  
**HEALTHY SCHOOL**  
**SERVICE SOCIETY** BIOMONITORING  
**LEARNING**  
**MULTITASKING**  
**COST-EFFECTIVENESS**  
**COOPERATION** NANOTECHNOLOGY  
**LIFELONG LEARNING**  
**PROMOTION OF GOOD HEALTH**  
**MARKERS**

A PARADIGM SHIFT IN OCCUPATIONAL SAFETY AND HEALTH – CHANGES AND TRENDS

SOCIETAL AND PSYCHOSOCIAL ASPECTS

CHEMICAL, PHYSICAL AND BIOLOGICAL HAZARDS

EFFECTS OF ECONOMIC AND POLITICAL INFLUENCE



“The global perspective is indispensable for the subjects of safety and health.”

### **The DGUV Governing Committee**

Employers and insured individuals enjoy equal representation with the same number of votes on the autonomous administration committees of all institutions of the German Social Accident Insurance (DGUV). The organs of the DGUV are the Members' Meeting and the Governing Committee. The Governing Committee elects its own chairs.

For the insured individuals: Marina Schröder (German Social Accident Insurance Institution for the energy, textile, electrical and media products sectors) and Wolfgang Stolte (German Social Accident Insurance Institution of the Federal Government, left in the picture). For the employers: Dr. Hans-Joachim Wolff (German Social Accident Insurance Institution for the building trade, 2nd from left in the picture) and Hans-Gerd von Lennep (German Social Accident Insurance Institution for the public sector in North Rhine-Westphalia, right in the picture).



# Prevention, today and tomorrow

## A foreword by the Chairs of the DGUV Governing Committee

Health, Globalization 2.0, demographic change and the “silver society”, New Work, mobility, digital lifestyle and networks: in the view of well-known trend analysts such as Matthias Horx and Klaus Burmeister, these will be the decisive megatrends in the coming years. Subjects which governments, enterprise and society must square up to, in order to find answers and solutions to the challenges of today and tomorrow.

The German Social Accident Insurance is already in the thick of all these topics, as this Prevention Yearbook clearly illustrates. All of the trends referred to above have a direct impact upon our work, and demand a corresponding response from us. For example, the demographic change that Germany is experiencing requires measures to retain fitness for work, for lifelong learning, and for the design of workplaces suitable for an aged and ageing workforce. At the same time, changes in the world of work, above all in the organization of work and of working procedures, place new demands upon occupational safety and health. Psychosocial stresses become more important; they are accompanied by new issues such as intercultural work and stresses resulting from the demands of mobility. Training measures are also affected: they must adapt to the new conditions, and they increasingly make use of modern digital media.

But in the traditional fields of prevention, too, new challenges await the German Social Accident Insurance Institutions. New hazards are constantly emerging. Among the latest is nanotechnology, which brings with it opportunities – but also risks. The German Social Accident Insurance has not been slow to address this field, and has already launched relevant research activity. The task is that of identifying the risks at an early stage and of developing responses to them swiftly by means of appropriate research activity and action. Our three research institutes deliver results that are acclaimed throughout the world.

Since the German Social Accident Insurance Institutions for trade and industry and for the public sector were brought under one roof, further tasks have arisen for them. These include prevention activity beginning in childhood – a fantastic opportuni-

ty, but one demanding concerted effort from us. We are therefore making the case for health and safety among society’s smallest members, and we hope that these topics will soon become part of general knowledge taught in schools. At the same time, as the projects described in this Yearbook show, we are ensuring that schools and children’s daycare facilities are conducive to safe and healthy teaching, learning, and growing up. Ground-breaking projects, such as that for the ergonomic classroom, are proof that we have adopted an innovative and forward-thinking approach in this area. Why? Because our commitment to prevention through all stages of life, from childhood to retirement, is one we intend to live up to.

One thing however has been very clear for many years: coping with all these tasks will be possible only if we are willing to broaden our horizons, to network, and to cooperate with others internationally. At national level, the Joint German OSH Strategy, launched in 2008, can point to positive milestones. It is clear however that virtually every question in prevention has an answer, somewhere in the world. We need only find it. And for that, we need to be networked – worldwide. Numerous enquiries from abroad show that the DGUV’s experts are in global demand. In numerous joint projects, we export our OSH expertise and put our commitment to occupational safety and health into practice on the international stage. The beneficiaries are not only people throughout the world, but also German companies investing abroad. At the same time, our overall competitiveness is enhanced.

The growing importance of national, European and international strategies and networks is reflected clearly by the articles in this edition of the Prevention Yearbook. Topics range from reports on the World Congress on Safety and Health at Work to the description of successful joint research activities. Thinking only nationally or locally means missing the boat. The global perspective is indispensable for the subjects of safety and health. We are therefore particularly pleased that high-ranking, internationally acclaimed experts have agreed to be interviewed for the Yearbook. Through these interviews, we aim at the same time to draw attention to the importance of the international perspective. Experience shows beyond doubt that very similar challenges are waiting to be met in all parts of the world. And if all can benefit from each other – all the better.



Prevention also means:

**Talking to colleagues.**



# A PARADIGM SHIFT IN OCCUPATIONAL SAFETY AND HEALTH – CHANGES AND TRENDS

Whether national, European or international: joint activities and concepts for greater safety and health at work require carefully crafted solutions for the continually changing conditions. Welcome to Occupational Safety and Health 2.0!

## World Congress 2011 in Istanbul

### The 19th World Congress on Safety and Health at Work: Global Forum for Prevention - current developments in occupational safety and health

“Promotion of a prevention culture for a safe and healthy future” is the main theme of the 19th World Congress on Safety and Health at Work, to be held this year from 11 to 15 September in Istanbul. The bodies behind the congress are the International Social Security Association (ISSA) and the International Labour Organization (ILO). The Turkish body responsible for organization is the Ministry of Labour and Social Security (CSGB).

One core element of the congress is the International Film and Multimedia Festival, organized by the Special Commission for Prevention of the ISSA. At the congress, a jury will select the best of the occupational safety and health films received beforehand, and award them with a prize at a public ceremony.

The congress will run for three days. Its programme includes three major plenary events, six technical sessions chaired by its three organizers, and 31 symposia presented by a number of different organizations. This specialist programme is framed by an opening and a closing event, a range of specialist workshops and seminars, numerous supporting events such as meetings of networks (for example of the WHO, ILO, EU-OSHA) and other in-

ternational and regional safety and health institutions, and specialist and cultural visits to Turkish businesses and locations. An accompanying specialist trade fair at the Istanbul Halic Congress Centre supplements the programme.

The 19th World Congress provides an opportunity for delegates to catch up on the latest developments and practices in occupational safety and health, and to share their experiences. Decision-makers in social policy, social insurance and commerce, OSH experts, employers’ and employees’ representatives, and any other parties with an interest in occupational safety and health are invited to attend. The congress languages will be English, German, French, Spanish and Turkish.

The DGUV and several of its members are supporting the preparations for the 19th World Congress in both subject-matter and organization through their comprehensive work in the ISSA. The ISSA and ILO have given Germany the task of organizing the next World Congress, the 20th, to be held in Frankfurt am Main in August 24-27, 2014. The host in 2014 will be the DGUV.

[www.safety2011turkey.org](http://www.safety2011turkey.org)



**Prof. Dr. Ömer Dincer** has been the Turkish Minister of Labour and Social Affairs since 2007. Having studied Business Administration and Politics in Erzurum (Turkey) and obtained his doctorate at the University of Istanbul, he worked among other things as a lecturer at the Faculty of Economic Science at Marmara University in Istanbul. From 1999 to 2003, Dincer ran the Institute of Social Science at Beykent University, also in Istanbul. He then served as the Prime Minister's Secretary of State until taking office as Minister of Labour.

## Turkey on the way to a modern social security policy

### Interview with Ömer Dincer, Turkish Minister of Labour

**Professor Dincer, from the European point of view, what are the most important developments in the field of occupational safety and health?**

The primary tasks of our ministry include defining the conditions of working life, facilitating and strengthening peaceful relations in industry, devising possible solutions for existing and potential problems in the world of work, promoting employment, ensuring occupational safety and health, and raising employees' living standards.

So that we can fulfil this mission better, many comprehensive reforms have been introduced in Turkey since the turn of the century. We have changed and improved a great deal, particularly in the field of occupational safety and health (OSH). The process of harmonising our laws with the rather lively legislation process in the EU is being successfully continued.

In years past, human and economic loss due to deficiencies in OSH gave cause for concern in all countries, including the most developed ones. This has resulted in global awareness and in the adjustment and ongoing development of EU legislation. It has therefore also become neces-

sary to restructure the Turkish OSH system as well. To this end, wide-ranging practical measures are currently being taken concurrently with legislative work – both nationally and with international participation. These include projects, campaigns, cooperative ventures, seminars for both sides of industry and the production of information material. The goal of these activities is to establish the preventive approach at work and to consistently refine OSH on the basis of risk analyses. The purpose of these is also to encourage the active participation of employees in OSH measures, to give systematic and high-priority treatment to health and safety at work and, above all, to develop an OSH culture with the joint commitment of everyone concerned.

By the end of 2004, a total of 21 regulations corresponding to the 28 EU directives in this field had been published. These are establishing in Turkey a dynamic structure that makes it possible to take suitable action with the participation of everyone concerned within defined framework conditions and in accordance with the needs of technical progress and differences in working conditions.

“For several years, OSH has been one of the areas to which huge importance has been attached in social policy not only in Turkey but also in the EU.”

#### **How have both sides of industry been involved in the reforms?**

As we all know, EU health and safety policy has the goal of bringing together everyone concerned, including employees. Characteristic of a culture of health and safety on the national level is that the right to healthy and safe working conditions is respected by all. It also entails that rights, responsibilities and duties have to be clearly defined. The active participation of government, employers and employees is indispensable for the creation of healthy and safe working conditions. A sustained improvement in OSH must enjoy top priority and involve all participants in industry, including both national and international companies. The key to the building of an infrastructure for OSH and greater efficiency is cooperation and dialogue between both sides of industry.

The most important development in this field is the founding of a national OSH Council in 2005. Convened on the basis of ILO Convention No. 155, it forms a platform on which those concerned can voice their proposals for the necessary steps, priorities, policies and strategies for effective OSH. This council brings together all the protagonists involved in OSH; these include not only trade unions and employer associations, but also universities, professional associations, civil servant unions and organisations in civil society.

The recommendations of the OSH Council have broken new ground for our ministry and went a long way towards meeting the goals defined in the 1st National Document on OSH policy for the 2006 to 2008 period. The now published 2nd National Document for the 2009 to 2013 period was formulated with the aid and involvement of all council members.

The following OSH goals have been defined in the 2nd document:

1. The Occupational Safety and health Act is to come into force, thus concluding the legislative work associated with this.
2. So that the new legal provisions can be effectively applied, the participating parties and the public are to be informed. It is then the task of the member organisations of the OSH Council to spread the word.

3. Occupational accidents per hundred thousand employees are to be cut by 20%.
4. In the case of expected but not yet ascertained work-related diseases, diagnosis is to be improved by 500%.
5. The OSH laboratory services are to reach 20% more employees.
6. Projects, further training and information dissemination measures carried out by the member organisations of the national OSH Council are to increase by 20%.

Summing up, we can say that our ministry is working with great enthusiasm on enhancing social dialogue aimed at implementing a modern European policy of social security. To this end, great importance is attached to involving both sides of industry in the drafting of the legal code as well as in projects, campaigns and further training measures.

#### **What is the role played by international cooperation partners in developments in Turkey?**

For several years, OSH has been one of the areas to which huge importance has been attached in social policy not only in Turkey but also in the EU. Many international projects for adjusting legislation to changes in working life in accordance with the political aims of the ILO and the EU and for realising the legal targets have been ground-breaking and helpful for our work for better OSH.

This includes the project “Building OSH in Turkey”, which marks an important step in our cooperation with Germany. The goal of the project is to bring OSH standards in Turkey into line with those in the EU and for this purpose to develop an effective and high-performance system for the enforcement of OSH regulations in industry. Special attention is devoted to small and medium-size enterprises in this connection.

The project is being realised by a consortium with the participation of partners from Germany. In the course of this project, several measures have already been taken. The purpose of these is to raise the institutional efficiency of our Directo-



“My vision is that we shall put our priorities into practice as quickly as possible and are able to effectively stamp out workrelated accidents and occupational diseases.”

rate-General for Occupational Safety and Health, improve the technical scope and administrative capacity of the laboratory of our Occupational Safety and health Centre (ISGÜM) and to raise the awareness of both sides of industry for OSH so that the legal provisions can be implemented better, particularly in small and medium-size enterprises. In the second phase of the project, mobile health services to monitor the health of employees in situ were introduced. This way we can inexpensively provide OSH services of high quality over large areas.

In addition, cooperation for three years was agreed in writing with the Institute for Work and Health of the DGUV (IAG, formerly BGAG) in Dresden. Many employees of the Directorate-General for Occupational Safety and Health who are responsible for health and technical services have undergone training at the IAG. Cooperation was extended for a further three years in 2010.

A cooperation agreement has also been signed with the German Social Accident Insurance Institution for the building trade (BG BAU). In the context of this agreement, many joint activities have been carried out for the construction industry, the sector in which fatal accidents most frequently occur – with the preparation of information material and the holding of a poster competition.

The project “European Network Education and Training in Occupational Safety and Health” (ENETOSH) coordinated by the IAG has also contributed greatly to the creation of a culture of safe working conditions. Turkey was one of the partner countries in this project and was represented by the Directorate-General for Occupational Safety and Health. Under the motto of “Safe start”, the project pursues the goal of addressing healthy and safe conditions in education, sensitising people at a young age to OSH and presenting examples of good practices. The project’s objectives have given OSH policy in Turkey a strong boost.

Many other projects have helped to intensify dialogue with EU nations, as they harmonised their OSH laws a long time back and have many years of practical experience. We have carried out several activities to that both sides of industry can benefit from this exchange of information and experience.

The above-mentioned European projects include:

- ▶ A twinning project with Finland on monitoring and controlling the market for personal protective equipment.
- ▶ A project for enhancing the quality of external services for OSH, carried out in connection with the Dutch government’s MATRA project.
- ▶ A project to improve OSH in Turkish firms, carried out in 2007 by a consortium with Austrian participation in connection with EU financial aid to membership candidates (IPA = Instruments for Pre-Accession Assistance). The focus of this project was on mining, the construction sector and the metalworking industry. It also involved the development of a registration system for OSH and sensitisation with the aid of information and training measures.

#### **Can Turkey blaze the trail for OSH in the Islamic world?**

We are interested in sharing our experience in this field with other countries. For this purpose, we have been holding talks with the Organisation of the Islamic Conference (OIC) since the end of 2009. In 2010, joint activities were agreed with SESRIC, the OIC’s Statistical, Economic and Social Research and Training Centre.

- ▶ SESRIC and ISGÜM are jointly organising a symposium at the 19th World Congress on Occupational Safety and Health at Work.
- ▶ At this congress, a platform of the Organisation of the Islamic Conference will be founded.
- ▶ Work will start on a programme for cooperation in vocational training in the OIC nations.

The first step in this cooperation was a working visit to ISGÜM in Ankara in May 2010. Taking part were seven OIC nations and the Arab Labour Organisation (ALO), each with one rep-

representative. In December 2010, an expert from the National Institute for Occupational Safety and Health (NIOSH) came from Malaysia for an exchange of information.

In connection with cooperation with Islamic countries, the following measures have been taken, among others:

- ▶ A joint database for cooperation in vocational training in the OIC nations.
- ▶ Further training of experts from the member states of the OIC in connection with expert exchange projects in the fields of in-situ measurement, analysis and risk assessment by ISGÜM.
- ▶ An information network for OSH for the OIC member states and ALO under the leadership of ISGÜM and SESRIC.
- ▶ Technical advice to OIC nations by ISGÜM.
- ▶ Surveys in the member nations to identify training needs. Training is carried out by our OSH experts.

All this illustrates what an active role our ministry is playing in OSH in the Islamic world. I hope that this exchange of information and experience will continue to be intensified in the years to come.

#### **What is your vision for Turkey in the field of OSH?**

My vision is that we shall put our priorities into practice as quickly as possible and are able to effectively stamp out work-related accidents and occupational diseases. These priorities include:

- ▶ The development of a health and safety culture in all fields.
- ▶ The further development of legislation for OSH so that it meets international standards, the requirements of companies and the needs of modern technology.
- ▶ The opportunity for all employees, irrespective of their status and even in the tiniest businesses with just one employee, to benefit from OSH measures.
- ▶ The joint commitment of everyone concerned – beyond the trio of government / employees / employers – to OSH.
- ▶ The increase in scientific papers and field research on new risk factors and the combating of accidents at work and work-related diseases.

A safe and healthy workplace means greater motivation for work, greater enjoyment of work and better quality of products and services. Ultimately, this means enhancement of the quality of life not only of individuals, but also of society as a whole.

#### **What can you tell us about the 19th World Congress on Occupational Safety and Health at Work in Istanbul in 2011?**

The World Congress has been taking place every three years since 1955 and is the world's biggest event on OSH.

The main themes of the congress are:

- ▶ Comprehensive, proactive and preventive approaches in OSH
- ▶ Systematic approaches to OSH
- ▶ Social dialogue, partnerships and innovation in OSH
- ▶ New challenges in a changing working world and in the world economy

The presentations and discussions in 31 symposia, 6 technical sessions and 4 regional meetings will help to intensify the exchange between developed and developing nations on health and safety at work, improve existing collaboration and facilitate agreements on new cooperation.

It is one of the most fundamental human rights to be able to work in a healthy and safe environment. Our motto is the development of a global OSH culture for a healthy and safe future. We are aware that this is no easy task and that we bear a big responsibility. We also know that the success of the congress depends on the support of its participants.

I warmly invite you all to visit Istanbul, one of the world's most beautiful cities, and support the 19th World Congress on Occupational Safety and Health at Work with your attendance.



# OSH strategies: a megatrend

**The international Strategy Conference provides a platform for the discussion of OSH strategies at national and international level**



The European Community strategies on health and safety at work 2002-2006 and 2007-2012 have provided new strategic impetus for occupational safety and health: besides better implementation of the EU regulations, holistic approaches and strategies for development of a prevention culture in Europe are now increasingly coming to the fore. One sign of this is that for the first time, existing strategic concepts are supplied with a common political framework. Almost all EU Member States now have an OSH strategy. This is a megatrend with a global impact, as demonstrated impressively by the supranational strategies of international organizations such as the International Labour Organization (ILO), the World Health Organization (WHO) and the International Social Security Organization (ISSA). Co-ordination between the various strategic approaches continues to be lacking, however.

For this reason, experts from a number of countries met for the second time at the beginning of February 2011 at the international Strategy Conference in Dresden. Under the heading “Five Pillars on Safety and Health at Work – prevention strategies for occupational safety and health”, they discussed how improvements could be made to the processes and structures, in order to create a prevention culture in the spheres of social policy, enterprise and society.

The conference delegates confirmed five core topics (“pillars”) serving as a common frame of reference for implementation of the various OSH strategies in the different spheres and as a contribution to a more holistic prevention culture in the future:

- (1)** Reducing work accidents and occupational diseases (vision zero)
- (2)** Raising awareness, developing competencies, and capacity building
- (3)** Cooperation between public health and occupational safety and health
- (4)** Health and safety as an integral part of lifestyle
- (5)** Integrating prevention into the social security system

In addition, a result identified by the conference with implications for the future is that better integration of occupational safety and health into other areas of policy, such as health, education, or even the media, requires a dedicated strategy. Such a strategy should respect and adapt to the modalities of the area of policy concerned.

The international Strategy Conference was organized by the DGUV in conjunction with the International Labour Organization (ILO), the International Social Security Association (ISSA), the European Agency for Safety and Health at Work (EU-OSHA), the International Commission on Occupational Health (ICOH), the International Occupational Hygiene Association (ICOH) and the International Association of Labour Inspection (IALI). Altogether, 110 experts from 34 countries attended: from 17 EU Member States and Albania, and from the USA, Australia, Brazil, South Korea, Singapore, the Russian Federation, Ukraine, Azerbaijan and Kyrgyzstan.

[www.dguv.de/iag](http://www.dguv.de/iag) (Webcode e107866)

## Custom training services

### A new series of seminars responds to growing demand from abroad

In the era of globalization, safety and health at the workplace are not merely a national issue. For this reason, the DGUV and its institutes cooperate with numerous foreign institutions and organizations. The Institute for Work and Health of the DGUV (IAG) has for example already trained OSH experts from Russia, Italy and Turkey. Delegations from Korea and China have also sought information on the IAG's training provision. This led to the idea of offering training tailored specifically to the needs of prevention experts in other countries. Since 2010, the institute has therefore offered a modular seminar programme for target groups outside Germany. Our experience has shown that these groups often seek tailored training provision in a form which is not available in the regular range of seminars. The seminar brochure therefore presents examples of seminar topics for which expertise is available at the DGUV and within the individual German Social Accident Insurance Institutions. Selecting topics from those available, the interested parties then compile their own custom combination of seminars. A cooperative agreement was concluded at the end of 2010 with

the Special Commission on Prevention of the International Social Security Association (ISSA). The purpose of the agreement was to publicize the international seminar programme jointly. The World Congress on Safety and Health at Work, to be held in Istanbul in September 2011, will also feature a training workshop for disseminators from other countries. Subjects will include standards for OSH trainers and lecturers, and also the IAG's "train the trainer" concept.

Offering seminars for target groups from other countries is part of the DGUV's strategic policy of internationalizing prevention work. If disseminators and decision-makers in other regions of the world are trained in Germany, the country's OSH standards will also be exported in the medium term. This supports the autonomous administration's formal objective of promoting a level playing-field for trade and commerce world-wide, and of making the world of work more humane.

[www.dguv.de/iag](http://www.dguv.de/iag) (Webcode e110478)

## From product to service standardization

### The standardization of services is growing in importance – supervision of the process by OSH representatives is essential

Services are assuming an ever greater role in modern economies: around 70% of total added value is now generated in the services sector. In addition, more and more services are being delivered across national borders, in the process increasing the need for European standards governing them. This development is reflected in numerous standardization projects, for example governing e-commerce, cosmetics, funerals, engineering and security systems. Many service standards are also combined with product standards, since enterprises often wish to offer their customers a complete package comprising product and service.

But what benefits do standards actually have for the quality of services? KAN, the Commission for Occupational Health and Safety and Standardization, takes the view that service standards are certainly of potential benefit for the quality of services, for example where consumer safety is concerned. They may also assist in liberalizing trade in services and eliminating barriers to trade. At the same time, however, they also give rise to conflicts. They may make reference to the persons delivering the services, as a result of which service standards may in some cases contain provisions governing the safety of employees. This aspect is however the preserve of the transposition of OSH directives in individual countries. Standardization in these areas, such as requirements concerning the wearing of personal protective equipment, contravenes the basic principle. Instead, these aspects are to be regulated by the relevant national OSH regulations governing employee safety.

In order for this position to be presented at an early stage during the development of standards governing services, supervision by the OSH lobby is essential. KAN therefore formulates comments on new standards work items in which it sets out the principles of its position concerning the standardization of services. Employees at the KAN Secretariat are also active on various committees at DIN, and monitor developments at European level. The active involvement in standards development activity by representatives of the institutions of the German social accident insurance system is crucial, in order for OSH interests to be submitted to this growing area of standardization work.



**BETTINA PALKA**  
Commission for Occupational Health and Safety  
and Standardization (KAN)



**“Standards in new areas – such as that of services – may conflict with national regulations governing the health and safety of workers at work. I therefore consider it important that as OSH representatives, we closely monitor the standards work items that we consider relevant.”**



## “My head’s somewhere else”

### The “Fight the Risk” prevention campaign draws attention to rash behaviour, both in in-plant transport and on the public highway

With its “Fight the Risk” prevention campaign in 2010 and 2011, the institutions of the German social accident insurance system are calling for greater safety during driving and transport tasks. Its objective is to reduce the accident risk by means of measures for behavioural and circumstantial prevention. Several organizations, including the German Road Safety Council (DVR), the German Road Safety Organization (DVW) and the Association of German Safety Engineers (VDSI) are parties to the campaign.

The activities and materials of “Fight the Risk” are aimed in the first instance at companies and their employees, and at schoolchildren and their parents and teachers. The target group extends to anyone involved in occupational safety and health acting as a disseminator by launching and conducting measures within companies. These parties are all challenged to accept more responsibility for themselves and others. Information materials illustrate how each individual can contribute to reducing accident risks by safety-conscious behaviour.

#### Specific objectives of the campaign are:

- ▶ Improving the safeguarding of loads
- ▶ Improving the safety of cyclists, particularly children and young people
- ▶ Increasing the safety of in-plant transport
- ▶ Increasing the number and quality of risk assessments concerning traffic safety
- ▶ Improving the observance of rules
- ▶ Improving visibility

#### Media and activities

Under the slogan “My head’s somewhere else”, the communication concept draws attention above all to rash behaviour and distractions which may cause accidents. Accordingly, the key campaign images show headless people in the instant before an accident.

## Common principles for prevention campaigns

In mid-2010, the German Social Accident Insurance evaluated the practice of joint prevention campaigns to date in a strategy symposium, and discussed principles for future campaigns. The following principles were agreed in the DGUV's committees. Joint campaigns were confirmed as a part of the prevention strategy of the institutions of the German social accident insurance system. They pursue goals of both circumstantial and behavioural prevention. The structure, comprising a joint umbrella campaign and campaigns by the individual supporting institutions targeting specific groups, is considered crucial to the success of the campaigns. In addition, detailed decisions were taken concerning how, when, and to some extent by what methods campaigns are to be planned in the future, and how their effects are to be evaluated.

[www.dguv.de](http://www.dguv.de) (Webcode d106644)



These eye-catching images are employed as postcards, posters and displays. Further traditional forms of communication used by the campaign are brochures and leaflets, CDs, films, and of course the [www.risiko-raus.de](http://www.risiko-raus.de) website. New approaches have also been adopted, particularly for communication with young people: personalizable web clips and a presence in a social network ([www.facebook.com/risikoraus](http://www.facebook.com/risikoraus)) are geared to the younger target group.

Besides the production and distribution of the campaign's own media, its topics are present in a wide range of press, radio and online media, owing to concerted press and media work and a range of joint media activities. A further pillar in the arsenal of campaign measures are events. These range from specialist events for disseminators, through trade fairs and public road-safety days, to company and school event days. The latter are particularly important for the German Social Accident Insurance Institutions: sectoral and targeted communication with the parties involved in OSH and the insured individuals on the ground. Personal consultancy and support motivates the target groups to launch preventive activities of their own, and is particularly effective in bringing about the desired changes in circumstances and behaviour.

## Evaluation

A concept was developed in order to evaluate the effectiveness of "Fight the Risk". During initial deliberations concerning evaluation, it soon became clear that accident statistics trends would be an unsuitable indicator of the campaign's impact, since they vary from year to year owing to various factors which cannot necessarily be influenced by a campaign. A phase model of the campaign impact was therefore developed. In this model, criteria and indicators for measurement of the campaign's impact are formulated based upon the defined sub-objectives of the campaign.

### The evaluation concept encompasses eight levels:

1. The scope of the campaign activities and measures: documentation of all measures in the areas of activities, media and promotional items
2. Response in the media: documentation and evaluation of press, online, radio and TV bulletins against qualitative and quantitative parameters
3. Perception level: measurement of the target groups' perception of the campaign (awareness, retention, comprehensibility, associations)
4. Behavioural/circumstantial/change level: measurement of actual changes within the target group (knowledge, attitudes, behaviour, image)
5. Impacts within companies: measurement of the campaign measures' effects upon specific performance figures in the company's/organization's results
6. Quality of the campaign's structure and processes: measurement and evaluation of the campaign's organization and procedures, in order for internal processes to be optimized
7. Recommendations for and consulting with the bodies responsible for the campaign with regard to evaluation: support for the participating institutions in evaluation
8. Reporting of evaluation: structured and continual reporting of the results of evaluation

Evaluation enables structured information to be gained swiftly on the progress of the campaign and its measures.

[www.risiko-raus.de](http://www.risiko-raus.de) (Webcode e98973)

Evaluation of prevention campaigns in IAG Report 1/2011e:  
[www.dguv/iag](http://www.dguv/iag) (Webcode d13378)



# Using virtual reality to prevent occupational accidents

**Virtual reality makes it easier to create human-machine interfaces for processes and products that are safe and usable**



**Human-robot interaction in virtual reality**

Many accidents and hazards at the workplace can be attributed to inadequate usability of products and processes. The frequency of maloperation during the control of machinery and the risk of protective equipment being manipulated can be reduced when products and processes are adapted to human beings and their tasks. The human ability to perceive, process and act upon information must be taken into account in the design of human-machine interfaces. Virtual reality (VR) opens up new, effective methods for this in occupational safety and health. In VR, employees react in and with a simulated, three-dimensional work environment. They exhibit natural behaviour during both normal and abnormal operations – but without placing themselves or others in danger.

At present, the Institute for Occupational Safety and Health of the DGUV (IFA) is evaluating the usability of an innovative safety control for mobile elevating work platforms. The acceptance and the effectiveness of a prototype of the new safety control are being studied in virtual working and accident scenarios. For example, the use of the safety control in practice can be evaluated whilst it is still at the development phase.

Another project provides assistance in identifying suitable electro-sensitive protective equipment, e.g., for safeguarding two- or three-dimensional detection zones, for specific work situations. In addition, standards governing the use of protective equipment safeguarding two-dimensional detection zones are being examined for their scope for transfer to three-dimensional zones.

Two further VR projects concern the development of safety concepts for future workplaces with collaborative robots, i.e. robots working directly alongside human beings. The projects are investigating the impact of robot design and movement on human cognition of hazards. What robot movements should be applied to avoid human error? How should the robot signal its approach to the human being? How should the worker control the movement of the robot when the two are manufacturing products jointly? The results will support occupational safety and health efforts in standardisation and at workplaces in industry.

**[www.dguv.de/ifa](http://www.dguv.de/ifa) (Webcode d108396)**

# DGUV Regulation 1

## Another form of German unification: towards a harmonized accident prevention regulation, “Principles of Prevention”

More than three years after the merger of the HVBG and BUK, the former umbrella associations of the statutory accident insurance institutions for the industrial and public sectors respectively, to form the DGUV, the very similar but nevertheless divergent accident prevention regulations in the industrial sector (BGV A1) and public sector (GUV-V A1) are no longer beneficial or justifiable. In 2009, the DGUV therefore decided to create a harmonized accident insurance regulation, “Principles of Prevention”, to serve as a universal basic regulation for the prevention activity of the German Social Accident Insurance Institutions. DGUV Regulation 1 is the result. At the same time, the draft of a DGUV Rule 101 is to be developed, serving as a guide and containing specific explanatory information on the individual clauses of DGUV Regulation 1.

In addition, the Ordinance on occupational medical prophylaxis (ArbMedVV) came into force on 24 December 2008. Besides these regulations, the “Occupational medical prophylaxis” accident prevention regulation (BGV/GUV-V A4) also applies. Nevertheless, the principle is follows: where statutory legislation contains particular provisions, accident prevention regulations must not contain virtually identical provisions, except and at most for the parts that are not covered by statutory legislation. This particularly concerns the provisions for follow-up care with respect to tasks involving carcinogenic or mutagenic substances and measures relating to occupational radiation exposure. These provisions are to be integrated into DGUV Regulation 1; with its entry into force, which is anticipated in the course of 2012, BGV/GUV-V A4 will at the same time cease to be valid.

As before, DGUV Regulation 1 is to describe the commissioning scales for OSH professionals; the intention is however to harmonize the scales. Suitable proposals for this purpose have been drawn up in the “Organization of occupational safety and health” expert committee.

References to statutory OSH legislation will continue to be a key aspect of DGUV Regulation 1. It extends the scope of statutory regulation beyond employees to encompass all insured individuals, for example including the personnel of the voluntary fire services and volunteers in the care sector. This will elimi-

**In 2009, the DGUV moved to create a uniform accident prevention regulation, “Principles of Prevention”, to serve as a universal basic regulation for the prevention activity of the German Social Accident Insurance Institutions.**



**MARCUS HUSSING**  
Central Prevention Division,  
Committees Coordination

”

**“Owing to the restrictive criteria in the German Social Code (SGB) VII for the drafting of new accident prevention regulations, these regulations are of particular importance. The new DGUV Regulation 1 will certainly be one of them.”**

nate legal loopholes; the body of regulations remains light, and brings the regulations in the statutory OSH legislation and the autonomous charter of the insurance institutions into line. Owing to the diversity of the insured groups, the wide range of hazards and the issues and personnel to which the regulations apply, the principle of proportionality prevents the statutory regulations from being applied to the same degree to all insured individuals. Not only do certain areas require the observance of special rules; in some cases, blanket application of the regulations would mean the observance of criteria which either could not be implemented owing to the hazards, or would not be necessary in full. The drafts of DGUV Regulation 1 and DGUV Rule 101 are currently the subject of intensive discussion at the German Social Accident Insurance Institutions.



## DGUV Regulation 2

### The regulation formulates measures to enhance quality in occupational safety and health in German companies and public administrations

On 1 January 2011, the accident prevention regulation governing occupational physicians and OSH professionals (DGUV Regulation 2) came into force. This regulation provides the German Social Accident Insurance Institutions for trade and industry and for the public sector for the first time with harmonized, identical criteria for substantiating the German occupational safety act (ASiG). The ASiG is thus substantiated in a uniform manner in all companies and educational establishments in Germany. The new concept has been in place since January 2011, and makes provision for standard supervision of companies regardless of size. The alternative mode of supervision for small businesses, already introduced for the German Social Accident Insurance Institutions for trade and industry, will come into force for the German Social Accident Insurance Institutions for the public sector two years later, on 1 January 2013.

At the heart of the reform is the new concept of standard supervision for companies with over ten employees. In future, supervision for such companies by occupational physicians and OSH professionals will comprise two new components: the basic supervision, for which the duration of assignment of the occupational physicians and OSH professionals is specified in the accident insurance regulation, and the company-specific supervision component, which must be determined by each company itself. Basic supervision ensures that identical basic requirements apply for comparable companies. The company-specific component matches the scope of supervision precisely to the requirements of the company concerned.

In the future, the tasks of supervision by occupational physicians and OSH professionals will be determined with reference to detailed catalogues of services. From these, it will be possible to determine the time and company personnel resources required. The starting-point in each case are the working conditions and hazards in the company concerned. Rather than specifying universal durations of assignment for the occupational physicians and OSH professionals for the task of supervision – durations which, up to now, have also varied strongly from one accident insurance institution to the next – the supervision requirement will be based in all cases upon the actual hazards and needs of the company in question. Adoption of DGUV Regulation 2 thus marks the launch of a completely new concept for supervision by occupational physicians and OSH professionals. At its heart is now a modern, needs-based approach to occupational safety and health and the associated tasks and activities of the parties to OSH within companies.

This change in philosophy requires occupational safety and health to be addressed actively, and prompts discussion of how it can be structured effectively. It requires continual dialogue between the occupational physician, the OSH professional and the employer, with the involvement of the works council. In the long term, this will enhance the quality of occupational safety and health.

[www.dguv.de](http://www.dguv.de) (Webcode d106697)

# Towards a common objective

## The Joint German OSH Strategy: an interim report

Acting together – with individual responsibility. Wide areas of the German OSH system have been characterized by this new approach since 2008, when the German national and regional governments and the German Social Accident Insurance Institutions, with the support of all parties to OSH and the social partners, together drew up the GDA. The GDA is a concept, anchored in the legislation, for a “Joint German OSH Strategy”.

Within the GDA, work programmes have been developed for pressing prevention issues. The programmes are implemented in companies and co-ordinated by the state and the statutory accident insurance institutions. With this strategy, the original goal of retaining and promoting employee safety and health at work and thereby of achieving long-term reductions in the costs to businesses and the social insurance systems has been brought even closer.

The favourable conclusion after the initial years of the programme is that all parties to the strategy are working towards the common objective. At the same time, the principle remains that in their cooperation within the GDA, the supporting parties nevertheless wish to retain their independence. The objective of the GDA is to optimize prevention for the benefit of companies; it is not that of merging the supporting parties at the expense of their unique features, such as their close association with certain industry sectors. The GDA results in the supervisory and consultancy structures of the state authorities and German Social Accident Insurance Institutions in the area of OSH being co-ordinated in a sustainable and efficient system of task sharing. The concerted efforts will deliver greater efficiency compared to the benefits of the individual systems.

The findings available from the experience gained to date have been and are being taken into account specifically in planning of the next GDA period, scheduled to begin in 2013. Examples are the formulation of a smaller number of work programmes, and their implementation in the German regions in accordance with criteria for greater harmonization at national level. Greater emphasis is also to be placed upon the “strategy” aspect of the GDA, and the overall process is to be geared more closely to the needs of the companies.

The target groups will be involved even more closely in the planning of future processes than was the case when targets were identified for the first GDA period. A workshop held in August 2010 for prevention managers at the German Social Accident Insurance Institutions yielded insights that they considered significant. These insights have already been given consideration in the plans for preparation of the next GDA period. A clear



### Safe driving and transporting – an important GDA target

signal from the prevention managers was that the focus should lie on a smaller number of prevention targets, and that these should be interdisciplinary and implemented supraregionally, rather than being sector-specific or implemented only in some of the German regions. In their view, the focus upon generic prevention targets would enable strategic approaches to be implemented more effectively.

Impetus with the same objective was provided by the 5th OSH forum held in Dresden in November 2010 at the Institute for Work and Health of the DGUV (IAG). The approach taken by the DGUV, the organizer of the 5th OSH forum, was to involve the various target groups more closely. This proved effective. The OSH forum has shown that considerable potential exists for enlisting support for the strategy, and that this potential can and should be harnessed if facilitated by suitable joint activities. The social partners continue to seek equal participation in the strategic control of the GDA through full membership of the National Occupational Safety and Health Conference (NAK). The current limitation of their involvement to an advisory role is an inherent deficit of the GDA and should be corrected at all costs during the next GDA period.

[www.dguv.de](http://www.dguv.de) (Webcode d2022) and [www.gda-portal.de](http://www.gda-portal.de)



## Design ergonomics

**Ergonomic design principles can be considered effectively at the planning phase of work processes**



Interactive simulator (left); digital 3D human model with cone of vision in a construction machine (right)

Modifying existing workplaces in order to improve their ergonomic design, for example with lifting aids for the prevention of work-related musculoskeletal diseases, is often complex and expensive. For this reason, companies are increasingly making use of ergonomic design principles at the planning stage of their work processes (design ergonomics).

For some years the Institute for Occupational Safety and Health of the DGVU (IFA) has been involved in the development and use of design ergonomics instruments in the context of company consultancy and research projects. The most recent example is a project involving an aircraft manufacturer in which ergonomic simulation measurements are performed in virtual reality (VR) and at model workplaces during the planning of airliner galleys. The IFA is also involved in a joint project with the TU Dresden, funded by the German Research Foundation (DFG). In this project, the ideal human fields of vision for the design of construction machinery are to be determined by means of VR and CUELA (computer-assisted measurement and long-term analysis of musculoskeletal workloads). The body postures and lines of vision of machine operators are recorded, first in practice in the field, then in an interactive simulator, before being evaluated. For this purpose, an interface with associated design software

was created between CUELA and a digital three-dimensional human model. The results will be made available in the future to designers of construction machinery in order for them to design drivers' cabins to be more ergonomic.

The IFA is involved in further topical examples of application of design ergonomics in a project launched by the German Social Accident Insurance Institution for the administrative sector for improvement of bus drivers' seating positions by means of seat memory, and in Kobra, the joint project on normative management of exposure and risks during physical work, which is funded by the German Federal Ministry of Labour and Social Affairs (BMAS).



**DR. ROLF ELLEGAST**  
Institute for Occupational Safety and Health of the DGVU (IFA), Head of Unit 4.3,  
Occupational science/ergonomics



**“Giving consideration to ergonomics at an early stage in work planning is sustainable and efficient. I am pleased that our research results in this area are being used directly in practice.”**

# Promoting physical activity at the workplace

Measures to promote physical activity can be evaluated from an ergonomic and occupational medical perspective by means of a procedure developed at the IFA



## What measures for promoting physical activity are effective at workplaces involving physical inactivity?

Physical inactivity is a serious problem for human health. The number of office workplaces associated with low physical activity is continually rising. Against this background, the development and evaluation of measures for promoting physical movement at the workplace is of great importance. In the course of a dissertation supervised by the German Sport University Cologne, a measurement system for precise analysis of activity, the “CUELA Activity System”, was developed at the Institute for Occupational Safety and Health of the DGUV (IFA). The CUELA system automatically detects body postures and tasks and determines the energy expenditure and the activity indices for various regions of the body. It can therefore be used to analyse the effectiveness of measures for promoting physical activity.

In order for these measures also to be evaluated with reference to medical prognostic parameters, an inventory of occupational medical methods was developed and tested in a dissertation supervised jointly by the Institute for Prevention and Occupational Medicine of the DGUV (IPA) and the IFA. The inventory comprises medical functional diagnostics, strength and stamina tests, questionnaires concerning physical and mental well-being, and the records of movement from activity logs and

movement sensors. The ergonomic activity analysis performed by the CUELA activity system also forms part of this package.

The suitability of the methods for recording the effects was tested in a scientific intervention study performed at the IFA. What measures for promoting physical activity are effective at workplaces involving physical inactivity? Situational and behavioural preventive measures were employed in order for the movement in the intervention group to be increased selectively. These included height-adjustable desks, high-level tables in the break areas, activity sensors for movement feedback, personal motivation, and incentive systems for participation in company sporting activities and exercise during the midday break. The intervention measure lasted for twelve weeks.

The test subjects in the intervention group exhibited significantly improved well-being, a reduction in body weight and resting heart rate, increases in mobility and strength, and improved endurance. Records of the movement also confirmed an increase in activity behaviour: the test subjects spent considerably more time standing, less time seated, walked more paces, and exhibited an increase in movement intensity.

The inventory of methods will be used in future in consultancy measures within the member companies of the German Social Accident Insurance Institutions, and also in further scientific studies.



A dynamic office workplace of the future?



Prevention also means:

**Being happy  
to be of service.**

# Hazards in emergency services

## The Topic Centre Occupational Safety and Health of the EU-OSHA has analysed emergency services throughout Europe for hazards

Emergency services serve the common good on a daily basis by dealing with emergencies and disasters. With each deployment, they run the risk of health hazards or even death. Risks may be presented for example by hazardous substances, infections, excessive stress upon the musculoskeletal or cardiovascular systems, traumatic experiences, long deployment times, unsuitable protective equipment, insufficient information on the hazards at the site of their deployment, and deficits in the preparation, training or co-ordination of the emergency service personnel.

Analyses of the trends over recent years suggest that disasters will occur more frequently in the future, and will lead to more severe damage and injury. The scope of deployment of emergency service personnel is therefore on the rise, and with it their physical and mental strain. For this reason, the Institute for Occupational Safety and Health of the DGUV (IFA) has taken part in a pan-European literature study commissioned by the European Agency for Safety and Health at Work (EU-OSHA). The particular hazards arising in the emergency services were studied. The results enable requirements to be identified that are to be met by the management personnel and organizations responsible for emergency services, in order for the health and safety of these personnel to be safeguarded:

- ▶ More comprehensive and systematic analysis of past accidents, near-accidents and disasters, in order for risks to be identified and avoided in the future
- ▶ Better preparation of emergency service personnel for hazard situations, by the extension of training measures
- ▶ Improved infrastructure for equipping with personal protective equipment (PPE), and more reliable selection of suitable PPE
- ▶ Better management of disaster situations
- ▶ Research activities for clarification of the adverse impacts of chemical and biological substances upon health

Specific training of emergency service personnel in the identification of hazards was found to be important. They must for example be in a position to recognize domino effects. For hazards to be assessed realistically, emergency service personnel must be familiar with the properties and effects of relevant chemical and biological substances, and must understand their labelling. These skills should be practised more frequently in training courses, as should the practical handling of the hazards and the correct selection, use, care and maintenance of PPE. Training should be provided for unusual situations in addition to standard scenarios. Physical and mental strain experienced by emergency service personnel can be alleviated by training in lifting and carrying, and fitness, stress management and disaster training. Training in these areas enhances the ability of emergency service personnel to respond competently in difficult situations. It gives them confidence that they have the situation under control. The literature study identified good preparation for deployment in disaster and accident situations as an important factor for the safety and health of the emergency service personnel.

## Prevention on the web

Further information and resources relating to the chapter “A paradigm shift in occupational safety and health – changes and trends” have been compiled here.

▶ **Joint German OSH Strategy (GDA)**  
[www.gda-portal.de](http://www.gda-portal.de)

▶ **The “Fight the Risk” campaign**  
[www.risiko-raus.de](http://www.risiko-raus.de)

▶ **Virtual reality in human-machine interaction**  
[www.dguv.de/ifa](http://www.dguv.de/ifa)  
 Webcode d108396

## Contacts

The DGUV is happy to provide assistance. Contacts are listed below for the various topics in the chapter “A paradigm shift in occupational safety and health – changes and trends”.

### World Congress, Strategy Conference

**Dr. Sven Timm**  
 Tel.: +49 2241 231-1316

### Standardization of services

**Bettina Palka**  
 Tel.: +49 2241 231-3462

### DGUV Regulation 2

**Dr. Frank Bell**  
 Tel.: +49 2241 231-1357

### Measures to promote physical activity

**Dr. Rolf Ellegast**  
 Tel.: +49 2241 231-2605

### Seminar programme for international target groups

**Katrin Boege**  
 Tel.: +49 351 457-1124



Prevention also means:  
**Transferring skills.**

# SOCIETAL AND PSYCHOSOCIAL ASPECTS

From mobile work, through multitasking, to violence at the workplace: developments in society as a whole also have an influence upon prevention activity. “Soft” factors are now increasingly becoming the focus of attention.

## Lifelong learning

### The training work of the German Social Accident Insurance Institutions reflects the educational philosophy of lifelong learning

The world of learning is undergoing change. The ability to resolve complex problems in working life creatively and independently is becoming increasingly important. At the same time, vocational challenges are changing at ever-decreasing intervals. The educational philosophy of lifelong learning addresses these challenges. According to this philosophy, people should be equipped to acquire and consolidate new knowledge, skills and abilities on their own, and throughout their lives. The “Didactic methods” advisory board of the DGUV’s “Initial and further training” committee has therefore drawn up a basic didactic method concept combining health and safety with the elements of lifelong learning. This concept is to steer future activity in the development of training measures relating to prevention.

The objective of the didactic method concept is to structure training to make it sustainable and suited to future needs. The concept is therefore built around skills orientation, i.e. the acquisition of abilities and skills required for the resolving of problems. These include not only subject-specific skills but also, and in particular, methodical, social and personal skills. Each individual learns in their own way. Participants in training events should therefore learn as independently as possible. For training to be of high quality, it must be matched closely to the requirements of the world of work and its value-adding processes. Skills should however be extended only in areas where they are actually needed. Finally, methods and media should be used which support active and autonomous learning. The aim is that

wherever possible, those pursuing training should continue to learn independently after completing a training measure. This development and promotion of the ability to learn independently, which enables learners to gear their own particular skills acquisition process continually to the requirements in practice, is a key factor in the training process.

This basic didactic method concept is being implemented for the first time in the project currently in progress for further development of the training of OSH professionals. The requirements profile for the OSH professionals was first revised, particular consideration being given to the requirements arising from DGUV Regulation 2. The key points for further development have been set out in guidelines for the future training scheme as a whole. The terms of reference for this are the 1997 paper concerning expert supervision, and the reference model. Further core elements are autonomous learning for the development of skills required for the performance of tasks by OSH professionals, monitoring of learning success, and quality assurance.

The basic didactic method concept is also being employed in the current project for further development of the training of labour inspectors. The objective is to develop the existing training system for the private and public sectors to form a common training concept for both. At present, the broad concepts and principles are currently being developed, together with the guidelines for training, which are to be geared to the principles for didactic methods.



Since 2006, **Dr. Jukka Takala** has held the position of Director at the European Agency for Safety and Health at Work in Bilbao. Following his studies in mechanical engineering and completion of his doctorate, Jukka Takala worked in Finland's state OSH system. He then headed the international Programme on Safety and Health at Work and the Environment (SafeWork) of the International Labour Organization (ILO).

## Only one in four European companies has procedures to deal with stress at work

### Interview with Jukka Takala, Director of the European Agency for Safety and Health at Work (EU-OSHA)

**Mr. Takala, globalization and increasing mobility have a visible impact upon the world of work. In your opinion, how does this affect the health of the population as a whole, and the health of workers in particular?**

Globalization has a social impact. Accident-prone workplaces have been "globalized" largely to other regions of the world, away from Europe. These days, European economies are not based so much on primary industries: service industries are now the main employer, while the proportion of workers in agriculture and fisheries and in manufacturing has decreased. It's easy to identify the technical issues in heavy industry that can lead to accidents, but the more subtle longer-term health issues such as stress can be harder to spot.

Increased mobility brings with it particular health and safety risks for many workers. Workers involved in global trade and those exposed to communicable diseases such as health-care staff and aircrews are high-risk groups.

Work changes due to new technologies and processes, changes in the workforce structure and labour market, and new forms of employment and work organisation. Working with networks across all time zones and 24/7 availability in the

business and IT sector are just a few examples.

Forecasts identified the following emerging risks: new forms of employment and job security, ageing workforce, work intensification, high workload, high emotional demands, including violence and bullying, and poor work-life balance.

Concern about psychosocial risks such as stress, violence and harassment is increasing, EU-OSHA's ESENER survey reveals. 79% of European managers voice their concern about stress at work. This reduces productivity. However, it is worrying that only 26% of EU organisations have procedures in place to deal with stress.

**In your opinion, do changes in society give rise to any new risks that have an impact upon health at the workplace?**

The increasing number of female workers, immigration, Europe's ageing population and the shift from traditional industries to a service economy are factors that have an impact on occupational health and safety.

The employment rate of women has increased from 50% to 60% between 2000 and 2009 and this process continues. Women tend to work in part-time or temporary lower paid jobs, of-



## “79% of European managers voice their concern about stress at work. This reduces productivity.”

ten subject to limited preventive services.

Concerns remain regarding the high employment rates of migrant workers in high risk sectors; the language and cultural barriers to communication and training in OSH; their tendency to work overtime, and chance of being in poor health and thus more prone to occupational injury and disease.

Over the last ten years the proportion of older people (50-64 years) in work has risen from around 49% to more than 56%. The ‘greying of Europe’ means that the retirement age will be raised; access to early retirement schemes will be further curtailed; and there will be greater incentives for older workers to remain in the labour market.

### **What aspects must health protection cover, and what workplace health and safety issues need particular attention?**

According to our recent European enterprise survey (ESENER) managers’ main OSH concerns in addition to accidents are MSD and stress, but violence, bullying and harassment are relatively high also. Levels of concern for these issues vary a great deal between countries as does the prevalence of procedures in place or measures to deal with them. Managers identify time pressure, job insecurity, poor cooperation between colleagues and poor communication between management and employees as the most important causes of psychosocial risks.

### **What is your opinion of the prevention and health promotion situation in Germany compared to other countries? What lessons from other countries can Germany apply?**

Germany has done relatively well in safety and health in Europe. Accidents are well recorded and the fatal accident rate, adjusted by industry structures in Europe, is much below average of the EU15. The economic crisis has had a smaller impact on working conditions than in most other countries. Serious health problems leading to long absences are also quite low as compared to others. In Germany, work incapacity has resulted in 1.3 million work years lost, leading to total economic loss of 75 billion Euro compared to Britain’s 115 billion Euro.

Moreover, 59% of the population say that safety and health problems have been improved or improved a lot in Germany over the last 5 years.

Germany has, however, a high level of work-related stress and rather traditional health and safety services while more modern procedures to reduce stress and other psychosocial risks are less frequent.

Germany has been active in the workplace health promotion by putting in place new initiatives (INQA), a Forum on Prevention and Health Promotion.

Lessons from other countries could include:

- ▶ Finnish healthy ageing initiatives resulting in employment growth of aged 55-64
- ▶ More attention to psychosocial risks, following e.g. France, Finland, Belgium, the Netherlands and Italy
- ▶ UK initiative changing from a “sick note” to “fit note”

### **What importance do you attach – here and now, and in the future internationally – to social insurance in the area of prevention?**

Due to the economic crisis and the demographic development of the European population, there is a strong pressure for reforms on social insurance systems. Better prevention is not only important for reducing accidents and sick leave, but also to enable European workers to have a longer working life. Here I see a great potential in better collaboration of pension, health and accident insurance systems, e.g. through development of “back-to-work”-programmes, or schemes that reward healthier and safer companies.

### **Looking back on five years at EU OSHA after many years at ILO: Which activities would you propose outside formalized institutional structures such as the agencies to promote safety, health and well being?**

We need ILO, WHO, European Union, national legal, social security, prevention and occupational health services. However, if we need to mobilize hundreds of the best experts quickly for solving a serious problem, formal structures are too slow. For that we need a mechanism that can mobilize expertise quickly. Following the successful model of the Intergovernmental Panel for Climate Change we are forming an International Panel for Working Life (IPWL) linking the best experts and organisations of the world to find solutions.

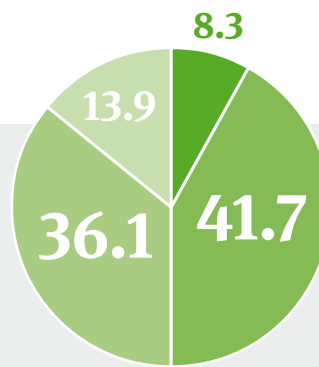


What status does the topic of “workplace health” currently enjoy at your accident insurance institution?

### Assessment of the status of “workplace health” by accident insurance institutions

- Exceptionally important (5)
- Fairly important (4)
- Very important (3)
- Somewhat important (2)

What status will the topic of “workplace health” enjoy at your accident insurance institution in five year’s time (2014)?



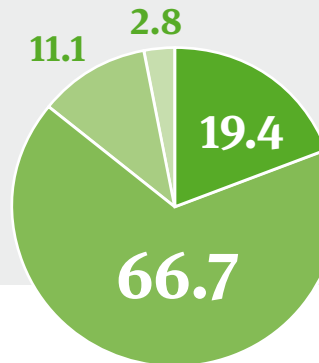
CURRENT STATUS

AVG.  
3.4

SIGNIFICANT DIFFERENCE

AVG.  
4.0

FUTURE STATUS



## Workplace health

### Experts on workplace health: activities of the accident insurance institutions



ANGELA KNOLL  
Safety and Health Department,  
head of the “Health Promotion” unit



**“Accident insurance institutions are experts on workplace health when they are appreciated by companies as the first point of contact in health issues. Close cooperation with the health insurance institutions is always a part of this.”**

The world of work is subject to continual change. New forms of organization of work and of communication are emerging; economic structures are being disrupted; contractual working arrangements are becoming more diverse. On top of these changes comes the demographic change. These developments make it essential for the German Social Accident Insurance Institutions to adapt their prevention services continually, in order to support their member companies appropriately in facing the new challenges. The focus increasingly lies upon health-related topics. The importance that these topics have now acquired can be seen from a survey of the German Social Accident Insurance Institutions’ activities in the area of workplace health conducted at the end of 2009. 50% of those questioned considered this field of action to be important to exceptionally important within their own field of action. When future relevance is considered, the proportion of respondents of this opinion rose to 86%.

Besides the established fields of ergonomics, skin diseases, physical/chemical/biological environmental factors and musculoskeletal diseases, great importance is attached to the following issues: organization of work, and its content; health-conscious management behaviour; mental stress and strain; and the promotion of physical activity. As yet, work that recognizes the ageing process and corporate integration management still play only a minor role in practice for the accident insurance institutions; in the view of those surveyed, however, they are set to become increasingly relevant.

The concepts of the German Social Accident Insurance Institutions for the establishment of OSH management systems also address the area of health, albeit not on the same scale as that of occupational safety. All available management concepts for example address the aspect of occupational safety, 89% address aspects of health protection, 59% elements of workplace health promotion, 41% the subject of quality management, and 37% aspects of corporate integration management. The result of the survey confirms that the issue of workplace health, including the aspects of the humane design of work in the promotion of good health, has been adopted at the German Social Accident Insurance Institutions, who have already accorded high priority to it. The interpretation and understanding of the topic of workplace health still vary widely, however. The challenges for them now lie in developing a common and consistent understanding of this wide and increasingly important field, in order for the natural role of the accident insurance institutions as “experts for workplace health” to receive widespread adoption.



# Living and working out of a suitcase

## Modern society is characterized by high expectations of geographical mobility, but the ramifications of this for human health have barely been researched

At the 3rd iga dialogue of experts on the subject of “mobility and health”, held in August 2010, staff from the statutory health and accident insurance institutions pooled their experiences with mobility expert Professor Norbert F. Schneider and his team. In the process, mobility emerged as an important prevention topic, since one worker in two in Germany is at present geographically mobile for occupational reasons, or was in the last three years.

Whether mobility has consequences, and if so what, is dependent upon a range of factors. These include the characteristics of the mobility itself (including its duration), and also the personality and personal circumstances of the affected individuals. The degree of control that workers have over their mobile work and life, and to what extent it is voluntary, are also factors.

Altogether, surveys of mobile and non-mobile employees show that the former fare worse in terms of stress, state of health, and emotional sensitivity than their non-mobile counterparts. The researchers also suspect that a “healthy-worker effect” is in play: they consider the consequences of mobility to be underestimated owing to strong selection processes. In the fu-

ture however, it should be possible for the impacts of mobility upon health to be demonstrated by objective criteria.

Nevertheless, prevention should not be put off. It is important that skills associated with mobility be enhanced, and that measures which safeguard the good health of mobile employees and are appropriate to the form of mobility be implemented in companies. Approaches and examples of good-practice measures have been collected jointly and published on the Internet.

The Initiative Health and Work (iga) is a joint project conducted by the DGUV in conjunction with the Federal Association of Company Health Insurance Funds BKK BV), the Federal Association of Local Health Insurance Funds (AOK-BV) and the Association of Substitute Health Funds (vdek). Prevention approaches in OSH and workplace health promotion are being developed further in joint projects. The “expert dialogue” series of events provides opportunities for prevention experts and external researchers to pool their experience on new prevention topics.

[www.iga-info.de](http://www.iga-info.de)

# The effects of multitasking

## What are the consequences for occupational safety and health when we perform several tasks at the same time?

Giving someone a quick call whilst at the wheel? Reading new e-mails during a meeting? Or simply having your mind on your customer whilst driving to see him or her? Growing time pressure at work clearly leads to us regularly completing two or more tasks at the same time. But what are the effects of this multitasking? Does it really enable us to work faster and more efficiently? The Institute for Work and Health of the DGUV (IAG) has conducted a study of the topic, and has also developed a multitasking module by which the effects can be experienced first-hand by anyone.

32 men and 32 women, aged between 21 and 60, took part in the study. They were given two realistic tasks. Firstly, they were to perform a drive on a simulator and to change lanes when given the signal to do so. Secondly, an office task was simulated in which the test subjects were to decide by pressing a button whether or not words displayed to them on the screen contained spelling errors. Both tasks were conducted first without, and then with an additional task. During the driving task, the participants were required to dial a telephone number on a mobile phone, or to read journey directions out loud. During the word exercise, a text was played to them, over

headphones, on which they were subsequently required to answer questions. The results show that performance deteriorated substantially, and that the subjective strain increased. Multitasking can also lead to physiological changes, such as an increase in the heart rate. However, neither sex- nor age-specific differences were observed. The study clearly illustrates the importance of the subject of “multitasking”, not least for occupational safety and health. Multitasking may constitute impairing mental strain and lead to accidents.

The IAG has developed a module in order to illustrate the effects of multitasking, including at health days and events held during the “Fight the Risk” campaign. Whilst performing the “lane-change” task, a participant was required to change lane regularly during a simulated journey on a three-lane carriageway, and to perform other tasks at the same time. The heart rate was measured during the exercise. This enables the participant to experience how their driving ability and heart rate change when they are performing another task at the same time as driving. The method was developed by the IAG, the driving simulator provided by Daimler AG.



# Prevention of violence at the workplace

## A comprehensive prevention programme within the “abba” project has led to appreciable improvements for employees at job centres



### Preventing violence: a topic also affecting public administrations

The abba project (the German acronym stands for workplace stress and threats in the job centres under Hartz IV) is examining how violence against employees in public administrations can be avoided. The focus lies above all upon the particular exposure situation of the employees in job centres, with regard to both the volume of work, and the control of emotive outbursts.

Besides a comprehensive prevention programme, which yielded initial measures to improve the situation (such as redesigning the entrance and waiting areas, reorganization of the office furnishings, training measures), a practical consultancy concept for the prevention of violence, the “Aachen Model”, was developed in cooperation with the Aachen police service. This concept is suitable for generic application and addresses the various facets and forms of violence, such as swearing, threats, spitting and physical violence. The principle is that a suitable strategy for action should be available for each dangerous situation. The model places possible dangerous situations in four different danger classes:

- 0 – Normal to heated discussion situations
- 1 – Verbal aggression, up to and including damage to property
- 2 – Violence to persons/duress, up to and including eviction of the individual from the premises
- 3 – Use of weapons, hostage-taking, rampaging

For each of the four danger levels, the concept shows the precise action to be taken in the threatening situations concerned (by the employee, manager, security service or police), and how to react to an unanticipated event (for example by banning the individual from the premises or initiating a call for emergency assistance). The technical and organizational preparations are also stated which a company or public administration must make in order to prevent violent events effectively. The “Aachen Model” is a tool by which prevention work can be structured in all facilities used by members of the public.

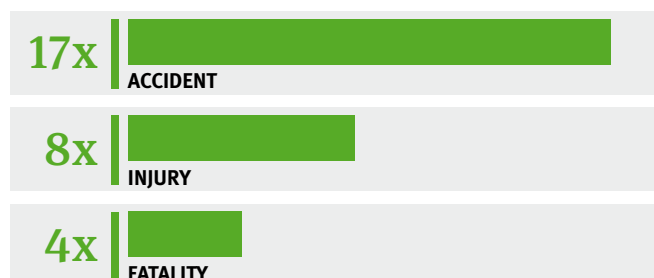
The prevention work of the abba project had a further positive effect: when the personnel, up to and including the managers, addressed the topic of violence, it became clear that the emergency calls system currently in use was obsolete. In order for the changing requirements also to be met in this area, not least in consideration of the third and fourth danger levels of the “Aachen Model”, attention shifted to the procurement of a modern emergency call system.

With the implementation of this integrative prevention programme, it was possible not only to optimize objective safety criteria, but also and in particular to substantially improve the subjectively perceived safety. The employees in the job centres have certainly seen benefits to their safety and health as a result of the abba project. Further information on the “Aachen Model” can be found in the brochure (in German) published by the German Social Accident Insurance Institution for the public sector in North Rhine-Westphalia on the subject of preventing violence in public administrations.

[www.dguv.de](http://www.dguv.de) (Webcode d32282)

# Driving simulator for response journeys by emergency vehicles

Response journeys by emergency vehicles constitute a major accident risk and impose considerable stress upon the emergency service personnel



Presentation of the accident risk with the use of priority rights compared to a journey without priority rights



Since 2005, the German Road Safety Council (DVR) and the Institute for Work and Health of the DGUV (IAG) have conducted road-safety training courses with the aid of simulators. To date, these courses have been geared to normal road users, such as business travellers and field service personnel, and also tradespeople driving vans. Together with the DGUV's team of specialists in fire services and emergency assistance, a catalogue of requirements for a simulator has now been implemented which permits training for emergency response journeys with flashing lights and sirens. The background to this development is the above-average frequency with which ambulance, police and fire service vehicles are involved in road accidents during journeys with flashing lights and sirens. The likelihood of emergency service personnel suffering an accident under these conditions is on average 17 times as high (see diagram). Critical situations which arise frequently during emergency response journeys were therefore selected as subjects of training. These situations include the crossing of junctions on red and driving on dual carriageways.

The requirements were implemented by means of the "SILAB" simulation software. This enables customized routes to be designed. The sequence of traffic events can be controlled in a complex manner: their incidence can for example be made dependent upon the driver's own (approach) speed, or whether or not he deviates from his lane. This is particularly important when the other road users are required to clear a path for the emergency vehicle. In addition, a steering wheel at the trainer's workplace enables the trainer to take control of vehicles within the simulation, in order to simulate specific behaviour on the part of other road users.

Parallel to the specification of the simulators, a seminar concept was developed which takes account of the didactic requirements of the emergency service organizations and the time available to them. The seminar concept integrates the simulator as a didactic element within the wider training strategy. The

concept enables training on the simulator to be performed within a single day. Twelve participants each have the opportunity to complete several journeys on the simulator.

The DVR and DGUV thus have simulator systems at their disposal for traffic scenarios which are suitable for adaptation to future developments. A hitherto unattained standard of simulator-based training for emergency-response journeys has therefore been reached by the accident insurance institutions. The first pilot seminars at the IAG, conducted for example by the German Social Accident Insurance Institution of the Federal Government (UK-Bund) for the German Red Cross, were highly successful. The response by the participants was thoroughly positive. In order for the sustainability of the training material to be tested, UK-Bund questioned the seminar participants again anonymously six months after completion of the seminar on their behaviour during emergency response journeys.

In short, a possibility has been created here by which a target group that has the task of minimizing the results of accidents and other disasters and which can take credit for doing so can itself be better protected against accidents.



DR. JÜRGEN WIEGAND  
Institute for Work and Health of the DGUV (IAG),  
Head of the "Road Safety" Section

**"Emergency response journeys are exceptional situations and place considerable stress upon the drivers. With the aid of the DVR/DGUV simulators, training can be provided in critical situations, enabling them to be avoided in traffic."**



# A school for children to love

The project for a classroom conducive to health and learning aims to improve safety and health in schools



**ANDREW ORRIE**  
Safety and Health Department of the DGUV (SiGe),  
Head of the "Schools (Primary & Secondary)" Unit



**"The development of good, healthy schools is possible only if awareness can be raised in society that education and health are closely linked. Both must therefore be addressed by prevention work in schools."**

The promotion of safety and health in schools contributes to improvements in the quality of teaching and to the well-being of schoolchildren and teaching staff. It is a part of schools' education and care mandate.

Building upon the "good healthy school" model, the DGUV's expert committee responsible for education has developed guiding expert principles from which all measures can be determined that are necessary for successful implementation in day-to-day prevention work. Promotion of sustainable awareness for safety and health is to be attained above all by dedicated measures in the fields of action of lessons, school atmosphere, school leadership, and habitat. The autonomous administration of the DGUV has explicitly declared this a key target in its position paper on prevention.

School buildings are not merely places of learning, but also habitats which are significant for successful learning and teaching and for the healthy development of children and the health of the teaching staff. The ideal environment for good teaching and learning can be created in particular by good ergonomic design.

This was the background to the launch of the DGUV's joint project "The ergonomic classroom: helping to make a good and healthy school" in 2010, in which the Institute for Work and Health (IAG) and the Institute for Occupational Safety and Health (IFA) cooperate closely with the German Social Accident Insurance Institutions for the public sector in Saxony and North Rhine-Westphalia. Research is conducted into how the "ideal" classroom conducive to health and learning should be designed, with regard to the furniture, colour schemes, room climate, lighting and acoustics. In order to determine this, two model classrooms were created, in a secondary school in Hennef and a primary school in Dresden. Conventional classrooms were converted, based upon the quality requirements developed by the expert committee responsible for education. A clear before-and-after effect can be seen: since the redesign, desks and chairs can be adjusted to the children's height; the board system is flexible; lighting is dynamic; the colour scheme is warm and harmonious; measures have been taken for noise abatement; the supply of fresh air to the classroom is better; and so on. The effectiveness of the measures is being evaluated in terms of the promotion of health and learning.



## Ergonomics in children's daycare facilities

### A study of the working conditions in children's daycare facilities is to assist in preventing musculoskeletal diseases among childcare professionals

During their daily work, childcare professionals frequently experience high levels of musculoskeletal workloads, for example as a result of awkward postures owing to low working heights. The ergonomic structuring of work in children's daycare facilities is therefore a recurring subject of public discussion.

In order for the current state of knowledge to be recorded and for suitable prevention measures to be planned, the Institute for Occupational Safety and Health of the DGUV (IFA) has created the "ErgoKita" working group, comprising representatives of the German Social Accident Insurance Institutions for the public sector in North Rhine-Westphalia and Rhineland-Palatinate, the German Social Accident Insurance Institution for the health and welfare services, the German Social Accident Insurance (DGUV), and the Institute of Ergonomics of Darmstadt University of Technology (IAD). In the first phase and in cooperation with the IFA, the IAD conducted a literature and product review of the physical workload situation and of possible prevention approaches in children's daycare facilities. The literature study revealed that to date, very few scientific studies have been performed on the subject and that no current figures are available for the musculoskeletal workload situation among childcare professionals in Germany. Furthermore, the influence of underlying structural conditions, such

as the growing number of under-threes in daycare, is not currently known. The product survey revealed preliminary approaches to solutions involving a reduction in stress, such as special desks or chairs for the childcare professionals, the efficacy of which has however not yet been the subject of scientific evaluation.

Against this background, the ErgoKita working group calls for a survey to be conducted of the workload situation in children's daycare facilities and of an intervention study for the scientific evaluation of prevention measures. For this purpose, children's daycare facilities should be divided into categories according to factors potentially influencing the stress situation, and an analysis of the present situation performed by assessment of the physical and mental work situation in a number of facilities. From the results of the analysis of the present situation, scope for prevention measures should then be identified, and the daycare facilities supported in their implementation. The efficacy of the measures should be evaluated; measures including standardized questionnaires and physiological measurements should be employed for this purpose. Finally, the results should be formulated in guides for use in practice. The ErgoKita intervention study has met with great interest in children's daycare facilities, and will be launched in 2011.



Prevention also means:  
**Being curious.**



# Researchers and children

## With the “Little Scientist’s House”, the DGUV and others aim to make the sciences attractive to preschool and primary-school children

What do the sparkle in little eyes, a cardboard tube, and prevention have in common? At first sight, nothing. Then the penny drops. The link is the “Little Scientist’s House”, a nationwide initiative in Germany involving companies and foundations from the areas of research, enterprise, technology, and the Ministry of Education. The initiative aims to bring children into contact with science and technology and to inspire them for it – where indeed this is actually necessary. For this purpose, beginning at preschool age, children investigate scientific phenomena with simple but in some cases astonishing experiments. They study, for instance, the number of different colours that make up the colour black. Or they make atmospheric pressure visible by means of simple tests. The children’s enthusiasm for the experiments often leads to their experimenting further at home. The experiments are taken from the children’s own environments, and have been tested successfully in pilot daycare facilities. The materials used are as simple as possible, and deliberately taken from everyday life. They include baking powder, straws and paperclips.

Along the way, the children also learn the meaning of prevention: for example that they should wash their hands after performing experiments, or that they should listen quietly to others during an experiment rather than running about. At the same time, through the children’s playful contact with technology and all that it entails, the way is to be paved for them to enter scientific and technical vocations.

In the “Schatzinsel” (“Treasure Island”) children’s daycare facility – the DGUV’s own facility for the children of its staff, at its Sankt Augustin site – the children have been researching and experimenting since the beginning of 2008. Researching is a regular activity in a research room set up especially for the purpose. The daycare facility itself was awarded the official title of the “Little Scientist’s House” in 2009. Since then, Treasure Island has also been a local network partner of the initiative in Germany’s Rhine-Sieg district. As a network partner, it seeks to attract other children’s daycare facilities to the Little Scientist’s House concept and to support them through to receipt of the award.

The DGUV has assumed responsibility under the initiative for its own company children’s daycare facility, and supports it in a number of ways. Two employees of the Institute for Occupational Safety and Health (IFA) have been trained as trainers by staff from the headquarters of the Little Scientist’s House. They organize and lead workshops several times a year for daycare professionals from children’s daycare facilities in the region. At these workshops, they explain the initiative and the experiments. At the beginning of the workshops, many of the daycare professionals still have reservations. But after seeing the first experiments, the response of many of them is “Wow!”. They overcome their shyness concerning things scientific and technical, and become enthusiastic researchers themselves. They then take this enthusiasm back to their own places of work and pass it on to the children.

[www.dguv.de/ifa](http://www.dguv.de/ifa) (Webcode d104325)

## Prevention on the web

Further information and resources relating to the chapter “Societal and psychosocial aspects” have been compiled here.

### ► Initiative Health and Work (iga)

[www.iga-info.de](http://www.iga-info.de)

### ► Violence at the workplace

[www.dguv.de](http://www.dguv.de)

Webcode d32282 / d69075

### ► The Little Scientist’s House

[www.dguv.de/ifa](http://www.dguv.de/ifa)

Webcode d104325

## Contacts

The DGUV is happy to provide assistance. Contacts are listed below for the various topics in the chapter “Societal and psychosocial aspects”.

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### Ergonomic Classroom

#### Andrew Orrie

Tel.: +49 89 62272-270

### Promotion of good health

#### Angela Knoll

Tel.: +49 2241 231-1171

### The effects of multitasking

#### Dr. Hiltraut Paridon

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Prevention also means:  
**Venturing into  
unfamiliar territory.**

# CHEMICAL, PHYSICAL AND BIOLOGICAL HAZARDS

Risks and opportunities presented by nanotechnology; carbon monoxide emissions from diesel engines; biological hazards in waste management – a whole range of new developments can be seen even in the “traditional” areas of occupational safety and health.

## Optimizing shift work schedules

**Shift work is an important topic for the accident insurance institutions and the social partners: the DGUV is reviewing the current progress of research**

Many employees in the health services, in the retail and catering trades, and in many other sectors, work in a 24-hour industrial or service world. Economic and social changes have resulted in the working day being extended further and further into the evening and night hours and weekends. Shift work has a wide range of impacts, often negative, for those affected.

Shift workers, particularly those working night shifts, often suffer sleep disorders, since their diurnal rhythm continues to be dictated by daylight or by their social and family circumstances. Sleep disorders may have a number of unspecific impacts upon health. These include poor concentration, nervousness, premature fatigue, loss of appetite, and stomach complaints. Various epidemiological studies discuss whether shift work is related to the incidence of cardiovascular disorders, breast cancer and mental disorders. Thus there are various possible effects of shift work, which correspondingly require complex preventive efforts.

The DGUV has formed a group of experts with the task of

- ▶ gathering up-to-date information on the subject of shift work with regard to the OSH-related issues;
- ▶ producing an overview of the statutory provisions and the guidelines and regulations of the German Social Accident Insurance Institutions.

The statutory provisions require that the working hours of night and shift workers be set out in accordance with validated scientific knowledge concerning the humane design of work. This means that the quality of the statutory arrangements is directly dependent upon the quality of labour science and the extension of knowledge in this area.

The results are published in a report. In addition, measures and recommendations for prevention are presented, as are good-practice examples. Review of the scientific findings on the one hand and of the legal aspects on the other enables the need for action on the part of the German Social Accident Insurance institutions and the legislature to be defined, and gaps in research to be identified. The project is led by the three research institutes of the DGUV: the Institute for Prevention and Occupational Medicine (IPA), the Institute for Occupational Safety and Health (IFA), and the Institute for Work and Health (IAG), together with the DGUV's Central Prevention Division.

In parallel with this activity and in cooperation with the Bergmannsheil University Hospitals in Bochum and the Helmholtz Centre in Munich, the IPA has planned a study into the influence of shift work upon sleep, well-being, the hormonal balance and the metabolism. This study, to be conducted on nurses, is to yield new scientific findings from which recommendations can be derived for healthy shift systems.

[www.ipa-dguv.de](http://www.ipa-dguv.de) (Webcode 558592)



**Dr. Kurt Straif, MPH, PhD** is Acting Head of the Monographs Programme of the International Agency for Research on Cancer (IARC). Following his studies and completion of his medical degree, training as a specialist in internal medicine and occupational medicine, habilitation in epidemiology and social medicine, and his studies and dissertation in public health and epidemiology (UCLA, Los Angeles), he has been employed on the scientific staff of the IARC since 2001.

## Perspectives for research and prevention of occupational and environmental cancer

### Interview with Kurt Straif, Acting Head of the Monographs Programme of the International Agency for Research on Cancer (IARC)

**Dr. Straif, the IARC is synonymous with research for the purpose of combating cancer. What does that mean, in practice?**

The IARC addresses the entire spectrum of cancer research: from recording of the number of new cases worldwide, through research into factors influencing cancer risk and the development of tumours, to secondary prevention, i.e. screening. The importance of this work is underlined by the significant global increase in new cases of cancer. In this context, the IARC Monographs on the cancer risk associated with certain substances, which have been published since 1971, have been of key and global significance. To date, over 100 Group 1 human carcinogens have been identified. In order to produce the monographs, the IARC sets up working groups consisting of leading experts. These have the task of inspecting and evaluating the literature on specific topics and classifying the level of cancer risk. Implementing this classification is then the responsibility of national and international organizations, such as the WHO and the ILO.

**To which topics would you draw particular attention in this context, and what do you expect future topics to be?**

The spectrum is very wide, and includes exposure scenarios such as stress, besides chemical, biological and physical factors. Substances on the Priorities List are found in the occupational sphere, such as iron oxide, or the environment, such as atmospheric pollution, or may be associated with personal lifestyle and nutrition choices, such as acrylamide. The examples also show however that a clear distinction cannot always be drawn between these different spheres. Research results from the world of work for example may yield valuable information of relevance to the environmental sphere.

**What is the situation specifically in the field of occupational medicine? On what areas is the IARC currently focusing, and how will the field develop?**

Around a third of the substances evaluated are primarily occupational in their origin. The current Priorities List also inclu-

## “The spectrum is very wide, and includes exposure scenarios such as stress, besides chemical, biological and physical factors.”

des numerous examples of exposure relevant to workplaces, including bitumen, diesel exhaust fumes, ultrafine particles and welding fumes. Molecular epidemiological studies and research into the mechanisms causing cancer will in particular become more important in the future as a means of determining the carcinogenic potential of exposure more quickly and reliably. The task will be to follow the example of the genome project, and effectively to decode an „exposome“ in the way that has already been done for the „genome“. The major challenge here is to determine lifetime exposure quantitatively and to develop methods that enable even relatively low exposures to be detected.

**The dearth of data often makes it difficult to evaluate even a discrete substance. The focus however lies increasingly upon the combined action of multiple hazardous substances. How are you nevertheless able to evaluate them?**

To date, relatively little has been available in the way of data. However, the pooling of multiple epidemiological studies for combined interpretation by means of improved determination of exposure is an important factor for success. A very good example of the study of combined exposure to multiple carcinogens at the workplace is the SYNERGY project, which is supported by the DGUV. This is currently the largest project on this subject worldwide; it examines occupational risk factors for lung cancer. At present, it encompasses over 17,000 cases of lung cancer, and even more controls. The data collected cover the entire vocational life, and therefore also the variety of possible combined actions. The lifelong smoking habits of all participants in the study have also been recorded. At present, five human carcinogens relevant to the workplace are being studied: asbestos, polycyclic aromatic hydrocarbons, quartz, chromium and nickel. Plans are for further significant potential pulmonary carcinogens, such as welding fumes or diesel exhaust fumes, to be included. The project could be extended in a further phase to cover other forms of cancer, such as cancer of the larynx. This would produce, effectively as a secondary benefit, a unique international database of occupation- and industry-specific exposure trends for significant hazardous substances.

**Let us now consider nanotechnology. Some regard it as a panacea, others as a source of hazards that will probably not be discernible for another ten years. What is your view?**

We must learn from mistakes made in the past and prevent history from repeating itself. Asbestos, which was also regarded

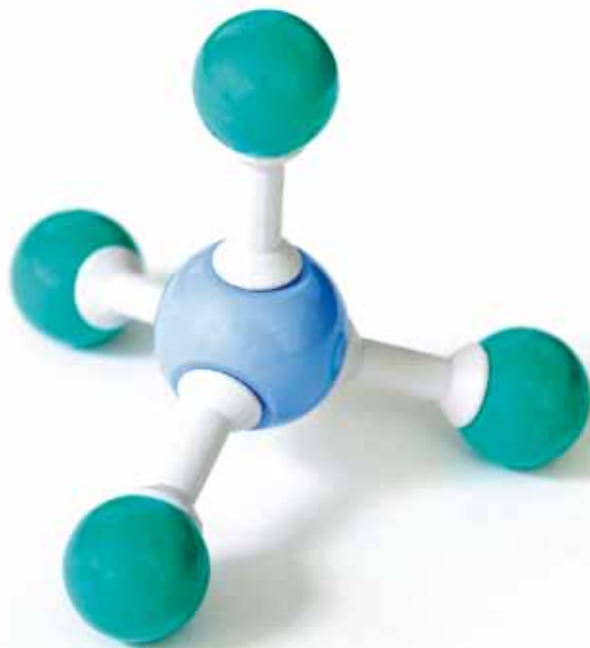
for a long time as a panacea, is a good example. Despite clear and early warning signs, decades passed before strict limit values were set and asbestos was banned in Europe. Nanotechnology is promising, but we must not allow fascination with it to distract us from the potential health hazards. The study of these requires substantial research resources. Initial research shows that the comparison with asbestos is not far-fetched. The studies describe toxic effects following experimental exposure to nanofibres or nanotubes that are similar to those following asbestos exposure. Nanotubes are already included on the Priorities List of the IARC Monographs. The IARC is planning to hold a workshop before the end of this year in which an exposure register is to be launched. In the long term, this is to permit analysis of cancer risks within a large-scale international cohort of workers subject to nanoexposure.

**The IARC evaluates not only substances, but also tasks the performance of which is suspected of causing cancer in workers. What examples can you give?**

Tasks performed in a seated position and stress are examples on the current Priorities List of the monographs. Shift work, which is suspected of causing breast cancer, was also evaluated recently. Following classification as „probably carcinogenic“, the IARC complied with the widely expressed request that it organize a workshop on optimized recording of exposure for shift work. A number of major research projects are now working hard on clarifying the potential cancer hazard posed by shift work.

**Prevention requires research. In the view of the IARC, what significance do applied research and basic research have here?**

Shift work is a good example of how closely applied research and basic research must be linked. Besides high-quality epidemiological and molecular epidemiological studies on a large scale, associated basic research in particular is also urgently required. The SYNERGY research project also clearly shows how numerous studies can be pooled at reasonable cost to form a large project delivering more meaningful results. With SYNERGY, we are producing, step by step, an exposure register of global reach for various sectors and issues. Intelligent pooling of data records and databases throughout the world produces a result that is more than merely the sum of their parts. This research approach shows the strategy that we must adopt in the future in order to generate scientifically robust results for sustainable prevention.



## The responsible use of nanomaterials

**The opportunities presented by nanotechnology can be exploited intelligently only if possible risks are identified in good time**

For this reason, the German Social Accident Insurance Institutions have called, in a DGUV position paper, for nanomaterials to be used responsibly. The German Social Accident Insurance has thereby set out the responsibilities for coping with a task affecting society as a whole, and has set out the terms of reference for concerted action. At the same time, companies and insured individuals are offered a strategic partnership for practical implementation. The position paper is based upon the prevention guidelines of the autonomous administration of the German Social Accident Insurance. In addition, two main elements of the recommendations made by the German NanoCommission are being brought to bear: the precautionary principle and the principles for the responsible use of nanomaterials.

The agreed terms of reference for action support the strengths of the German Social Accident Insurance. In the light of current knowledge, research conducted in the DGUV's institutes and the funding of third-party research are of particular importance. The focus lies upon safety research. The IFA continues for example to be involved in European research projects and joint activities concerning nanoparticles at the workplace. The purpose of this activity is to develop portable instruments for measurement of the particles in the air (Nanodevice) and for determining and evaluating exposure to nanomaterials (Nanoimpactnet). In the QNano project, several "centres of excellence" also provide the infrastructures for toxicological and metrological study of nanoparticles. In addition, workshops are being held on regulation which also address the appropri-

ate measurement strategy for these particles. At ISO, the International Standards Organization, documents are being drafted on terminology, measurement methods and characterization of nanomaterials, and also on health and safety aspects. The IFA is contributing its experience in instrumentation and measurement methods to these processes.

Custom consulting and information services are to ensure that adequate care is taken during the use of nanomaterials. The aim is to raise awareness for the topic among the accident insurance institutions' own employees, and to promote their competence as persons responsible for the issues. Direct access to the companies enables problems to be identified and solved on the ground. Good-practice examples can for example be identified and disseminated.

Besides supporting fields of action, the position paper also has the purpose of mobilizing forces. A network is being set up in order to promote the exchange of information and co-ordination of internal activities. Through a concerted approach, future development can be influenced on a sound basis with close cooperation between researchers and practitioners in the field. The vast knowledge and many years of experience of the German Social Accident Insurance Institutions in prevention will prove invaluable.

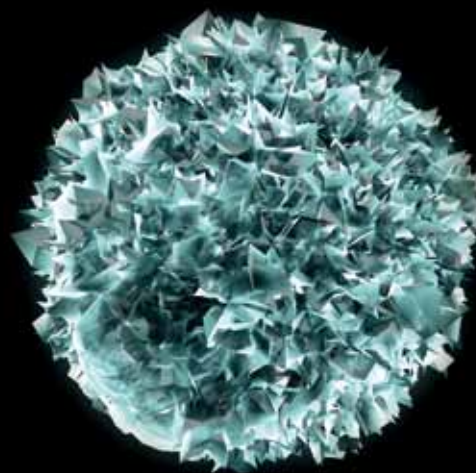
Nanotechnology:

**[www.dguv.de](http://www.dguv.de) (Webcode d92133)**

Ultrafine aerosols and nanoparticles at the workplace:

**[www.dguv.de/ifa](http://www.dguv.de/ifa) (Webcode d90477 and e95204)**

The German Social Accident Insurance Institutions began at an early stage to gather questions from the field in order to determine the need for more detailed provisions and further support.



## Risk concept for carcinogenic substances

The accident insurance institutions, the IFA and the IPA answer questions regarding assessment of the exposure to carcinogenic substances at the workplace

Many carcinogenic agents and their metabolites modify the genetic information stored in body cells, and may therefore give rise to life-threatening tumours. The risk of contracting cancer is dependent upon what substances enter the body, and in what quantity. It is not usually possible to formulate occupational exposure limit values for these substances the observance of which ensures that health is reliably protected.

What cancer risk at the workplace is borderline tolerable? This question has been addressed in recent years by the AGS Committee for Hazardous Substances with the substantial involvement of the German Social Accident Insurance Institutions, their research institutes IFA and IPA, state bodies and the social partners. The result was the creation of a concept for evaluation of workplace exposure to carcinogenic substances, which was published in 2008 in the "Announcement 910" on hazardous substances. The levels of the tolerable and acceptable risks of a disease are presented for multiple substances. The levels are geared to unavoidable daily risks, and represent a sociopolitical consensus. The exposure-risk relationships, serving as scientific principles, are also described. With this approach and a concrete package of measures, the hazards presented by carcinogenic substances at the workplace are to be reduced to a minimum.

The risk-acceptance concept is currently a recommendation of the AGS. Should it prove effective in company operations, it is to be integrated into the German Ordinance on hazardous substances. In many companies however, need is still seen to exist for this subject-matter, which is not straightforward, to be explained. An understanding of the issues is important: some amendments of existing technical rules already explicitly recom-

mend that available risk values be employed as a yardstick for risk assessment.

The German Social Accident Insurance Institutions began at an early stage to gather questions from the field in order to determine the need for more detailed provisions and further support. The questions have been included in a catalogue of questions and answers, and published on the IFA's website. In conjunction with the AGS and KOGAS (the accident insurance institutions' co-ordinating group for hazardous substances), this catalogue will be updated as required.

[www.dguv.de/ifa](http://www.dguv.de/ifa) (Webcode d105371)



**DR. ROGER STAMM**  
Institute for Occupational Safety and Health  
of the DGUV (IFA), Head of Division 1: Information  
Technology, Risk Management



**"With the concept of the 'acceptable risk', we seek to make the health risks posed by carcinogenic chemicals at the workplace transparent, and to submit them to public discussion."**



# Binding limit values for atmospheric pollutants at workplaces

## Differentiating between unpleasant effects and irritation



**The doseresponse relationship of unpleasant effects can be studied simultaneously on four test subjects in the exposure laboratory of the IPA (ExpoLab).**

Numerous substances in the workplace atmosphere may lead to unpleasant effects such as odours or mucous membrane irritation, health complaints, and in some cases disorders of the upper and lower respiratory tracts. Controlling these effects by means of health-based limit values is frequently difficult, since human data of validated quality are –virtually – non-existent. Provided that they are not unreasonable, unpleasant odours at workplaces are not generally regarded as being harmful to health. Conversely, irritation of the mucous membranes of the eyes and upper respiratory tract are considered to have a harmful effect upon health. Around half of the German binding limit values for hazardous substances at workplaces are based upon the avoidance of irritation caused by the substances. Adequate prevention therefore requires differentiation between irritative action and mere unpleasant effects.

Since 2003, the DGUV has been supporting an association of research bodies comprising the Institute for Prevention and Occupational Medicine of the DGUV (IPA), the Institute for Research on

Hazardous Substances of the German Social Accident Insurance Institution for the raw materials and chemical industry (IGF), and the Leibniz Research Centre for Working Environment and Human Factors at TU Dortmund University (IfAdo), in order to develop valid study methods and to produce data of validated quality.

This situation also led to an exposure laboratory (ExpoLab) being set up at the IPA. Under controlled and standardized exposure conditions, the dose-effect relationship of unpleasant effects and irritative action can be determined simultaneously on four test subjects. A differentiated method spectrum enables exposure effects upon the eyes, the nose, through to the pulmonary alveoli to be studied objectively and quantitatively.

The objective of the research at the IPA is to obtain a generic evaluation of the large number of relevant irritants from the data for individual irritants. The high relevance of research into irritants is also reflected in the creation of a generic working group for the determining of binding limit values for local effects. The working group was created jointly by the MAK Commission of the German Research Foundation (DFG) and Subcommittee III of the AGS Committee for Hazardous Substances at the German Federal Ministry of Labour and Social Affairs (BMAS). Led by Prof. Thomas Brüning, Director of the IPA, the working group has the task of focusing scientific expertise in the area of irritant research, and co-ordinating activities between the MAK Commission, the AGS, and the DGUV and its members.

[www.ipa-dguv.de](http://www.ipa-dguv.de) (Webcode 297984)



**DR. KIRSTEN SUCKER**  
Institute for Prevention and Occupational  
Medicine of the DGUV (IPA), member of the scientific  
staff at the Medicine Competence Centre

**“With our research into irritants, we are making an important contribution to the determination of health-based limit values with validated quality, since limit values for many working agents are based on irritative effects.”**

# Effects of hazardous substances in cell cultures

## The IPA is studying changes in cultured cells following exposure to hazardous substances

In order for risks posed by hazardous substances at the workplace, studies at the cellular and molecular level are required, in addition to occupational epidemiological studies. Cell biological studies can on the one hand help to explain epidemiological findings; on the other they can be useful to reinforce scientific hypotheses, which can then be examined further in field studies.

At the Institute for Prevention and Occupational Medicine of the DGUV (IPA) cultured cells are exposed to hazardous substances and the resulting changes are analysed at the cellular level. By this means it is possible to study the modes of action of hazardous substances, for example by comparison of treated and untreated cells. The exposure conditions in such model systems can be defined precisely and modified systematically. It is therefore possible to study not only the effects of individual substances or their reactive intermediates, but also those of complex substance mixtures. The spectrum of the cell biological parameters employed ranges from early changes, for example at the enzyme level, to late parameters, such as cell death – a final consequence of toxic effects. Within the scope of studies into the effects of hazardous substances the Syrian hamster

**At the Institute for Prevention and Occupational Medicine of the DGUV (IPA), cultured cells are exposed to hazardous substances and the changes analysed at cellular level.**

embryo (SHE) cell transformation assay is also utilized. Various studies indicate that this test system is a valuable tool for predicting the possible carcinogenic potential of chemicals. In the She assay, She cells (cells of Syrian hamster embryo) are treated for one week with various concentrations of a test substance. The cells are then fixed, stained, and morphological changes are evaluated with the help of a stereo microscope. The results of the studies indicate together with other published data that the SHE assay appears to be particularly suitable for estimating the carcinogenic potential of aromatic amines.

[www.ipa-dguv.de](http://www.ipa-dguv.de) (Webcode 543232)

# Avoiding exhaust emissions effectively

## Machines are frequently used at poorly ventilated workplaces – exhaust gas emissions must therefore be prevented at source if at all possible

Engines employing fossil fuels produce a wide range of hazardous substances, including carbon monoxide, hydrocarbons, benzene, carbon dioxide, nitrogen oxides, and in some cases particulates. If machines employing such engines are used at workplaces with poor air exchange, the concentration for example of carbon monoxide at the workplaces may rapidly reach serious or even dangerous levels.

Types of machine affected include construction machinery such as concrete compactors and vibrating beams, and also floor sweepers and electricity generators. These machines are frequently used in environments in which the air exchange is poor, such as indoors or in pits. The emission rates from them vary appreciably according to the power of the engine, whether it runs for example on petrol, diesel or liquefied petroleum gas, and whether technology is employed to treat the exhaust emissions. In ideal cases, electric machinery that emits no exhaust gases whatsoever can be used.

The Commission for Occupational Health and Safety and Standardization (KAN) is addressing the issue of how, in the light of these issues, such machines may satisfy the requirements of the EU Machinery Directive, and what role is played

in the process by harmonized standards. The objective of the directive and of prevention activity is to prevent hazards at source if at all possible. It is therefore unsatisfactory for machines to be placed on the market accompanied by a statement that they may not be used at workplaces exhibiting poor air exchange, or that the operator is responsible for further measures should unacceptable exposure otherwise occur. Such statements fail to reflect the reality of many applications, and are therefore easily ignored.

It would be preferable for possible forms of low-exhaust drive technology to be set out in the product standards. With the aid of KAN, Germany has begun by successfully calling for the harmonized standard EN 12649:2008, “Concrete compactors and smoothing machines - Safety”, to be improved in this respect.

The task for the future is that of identifying what technical solutions are available for the various machines, and how the exhaust gas concentrations can be measured reliably in individual cases. Once that has been achieved, appropriate amendments could be made to the requirements in other standards, such as EN 60335-2-72 governing liquefied petroleum gas-powered machines for floor treatment.



# Biomarkers for the early detection of diseases

## Research on diagnostic measures for preventive healthcare

Certain types of cancer and dementia are set to become widespread in the medium to long term, owing to the increasing life expectancy of the population. Researchers have great hopes that protein biomarkers will permit early detection of such diseases in the future thereby improving treatment and influencing health outcomes. In principle, the idea is well established. In the presence of cancer or dementia, certain proteins are either produced in greater numbers, or their production is reduced or halted completely. These changes must be detectable in the body, for example in the blood or urine.

Many approaches have however failed at the implementation stage: that of actually producing a valid cancer diagnosis by means of a simple blood or urine sample. This failure is due in part to the inadequate characterization of the biological samples and the lack of evaluation of biomarkers under the conditions on the ground in clinical practice, despite the approach having been used effectively for decades in the development and licensing of drugs.

The Protein Research Unit Ruhr within Europe (PURE) in Bochum now aims to transfer the principle of drug development to the area of protein biomarkers for early detection of diseases. PURE, of which the Institute for Prevention and Occupational Medicine of the DGVV (IPA) is a founding member, is covering for the first time all aspects of biomarker development, through its identification and validation, to the development of diagnostic detection methods in the field. One focus of the IPA lies upon

creating a cross-platform scientific study centre. In this centre, patient samples will be collected within an association of clinics, with observance of all relevant provisions governing ethics and data protection, and in accordance with a QA procedure. The samples will then be prepared for the subsequent protein analyses. The study centre will also be responsible for management of the scientific and epidemiological data.

A second focus at the IPA will be that of characterizing the tumour cells in the tissue, blood and urine of the patients in PURE's molecular tumour biology facilities. For this purpose, molecular biological and chemical analytical methods will be used to examine the complex interaction between environmental and genetic factors in the causation of cancer. The methods employed for this purpose include measurement of the exposure to carcinogenic and mutagenic substances in the human samples, and study of the tumour cells for the presence of mutations or other changes at the genetic level.

In the area of cancer research, the focus lies upon the early detection of bladder cancer and liver tumours. In future, PURE's scope is also expected to be extended to the lung. In this way, the institute will in the long term meet the logistical criteria for creating a cohort of patients and control subjects for the early detection of the most varied forms of cancer relevant to occupational medicine. The IPA is convinced that bringing top international research and clinical practice together will deliver huge benefits for the prevention work of the accident insurance institutions

# Exposure to mites in children's daycare facilities

## Research in the interests of society's smallest members and their carers

According to the Robert Koch Institute, around 20% of children and young people are sensitized to allergens. This includes sensitization to house-dust mites. Up to now, virtually nothing has been known about whether house-dust mites in children's daycare facilities present a greater problem than in the domestic environment. Children in daycare facilities are however of particular economic interest as a target group, since early childhood constitutes a very sensitive window for the development of allergies.

Together with the German Social Accident Insurance Institution for the public sector in North Rhine-Westphalia, the Institute for Prevention and Occupational Medicine of the DGUV (IPA) is studying whether exposure to the allergen of house-dust mite in children's daycare facilities in North Rhine-Westphalia differs from that in the children's home environment. Samples are being taken at 20 facilities in North Rhine-Westphalia over a year at intervals of three months. The aim is not to identify deficits in hygiene. The starting-point is the equipment of the facilities. These contain cushions, carpets, rest areas with mattresses – in short, many surfaces which may be colonized by house-dust mites. Particular attention is being paid in the study to detecting mite allergens in atmospheric samples, for which the IPA has established particularly sensitive immunological measurement methods.

Where and how sampling is to be performed is specified precisely. At least five rooms are studied in each children's daycare facility: the group area, adjacent room, sleeping area, cloakroom, and the room used by the childcare professionals. Should one of the facilities have several groups, and therefore more rooms, the number of sampling sites is increased accordingly. The passive sampler, which consists of electrostatic dust cloths, is used to collect samples of atmospheric dust on a shelf or cupboard. Part of the floor is also vacuumed. In order to ensure that the area studied is always of the same size, the area to be vacuumed is marked out by means of a plastic template. Samples are also taken in the same way from carpets, chairs or mattresses. For comparison with the possible exposure to mites in the children's daycare facilities, samples are also taken from their homes. Results from the study are expected in mid-2012.

**According to the Robert Koch Institute, around 20% of children and young people are sensitized to allergens. This includes sensitization to house-dust mites.**

# Health risks in composting plants

## For many years the IPA has observed the impact of dusts and bioaerosols upon the health of employees

Measurements conducted in composting plants in the early 1990s revealed high exposure to biological agents, especially fungi and bacteria. In a cross-sectional study, an increase in health complaints concerning the eyes, respiratory tract, gastrointestinal tract and skin were observed among the employees. In response, a long-term study funded by the German Federal Institute for Occupational Safety and Health (BAuA) was drawn up in order to record risks of chronic disease resulting from long-term exposure to bioaerosols and organic dusts in the installations.

In this prospective cohort study project, employees in 42 composting plants were studied over a period of over 12 years. The studies were performed in the years 1996, 1997, 2001 and 2010. Over 250 composting-plant employees and control test subjects took part in the follow-up studies. Besides the use of questionnaires and medical examinations to record the health complaints, results were obtained by non-invasive methods for the pulmonary function, antibodies in the blood, and indications of infection of the respiratory tract. Atmospheric dust measurements were also conducted in all composting plants. The latest provisional interpretation conducted by the Institute

for Prevention and Occupational Medicine of the DGUV (IPA) revealed that substantially more employees complained of coughing in the last study in 2010 than at the beginning of the study project. Among the employees of the composting plants who had since stopped working there, the complaints eased or disappeared altogether. Many pulmonary function results became conspicuously worse. Since the control subjects were also affected, however, further evaluation of these data is required. Employees in composting plants exhibited higher antibodies to fungi, whereas the control subjects were more highly sensitized to environmental allergens.

The researchers at the IPA are currently discussing the results with representatives from the waste management sector, the Federal Institute for Occupational Safety and Health (BAuA), and the German Social Accident Insurance Institutions for the public sector in North Rhine-Westphalia and for the transport industry. Together, they are considering how the results could be incorporated into the prevention work of the accident insurance institutions.

[www.ipa-dguv.de](http://www.ipa-dguv.de) (Webcode 545792)



# Biomonitoring delivers exposure information

Researchers at the IPA are developing methods by which quantities of hazardous substances in the body can be reliably detected, measured and interpreted



## Atomic absorption spectroscopy enables metal exposure to be detected by biomonitoring

Atmospheric measurements at the workplace provide valuable information on what hazardous substances employees may absorb by inhalation. Biological monitoring, however, takes a different approach: it indicates what quantities of hazardous substances are actually absorbed by human beings. Biological monitoring measures substances absorbed not only through respiratory intake, but also through the skin, or oral uptake. The hazardous substances or their metabolites are generally measured in body fluids such as blood or urine. In order for occupational and non-occupational exposure to be distinguished, differential measurements are employed, for example by sampling on employees before and after their shifts.

The Institute for Prevention and Occupational Medicine of the DGUV (IPA) is developing highly sensitive and specific analytical methods for different exposures and tailored to each hazardous substance or substance group. When necessary, data on the human metabolism of certain hazardous substances are also generated at the IPA. Firstly, these provide a better understanding of the mechanism of action of hazardous substances; secondly, they permit precise extrapolation of the absorbed dose from the concentrations measured in the urine or blood.

Depending upon the rate of discharge of the substances from the body, biological monitoring permits conclusions not only regarding very recent exposure (short-time biomarkers), but also regarding exposure over the previous days or even months (long-term biomarkers). The IPA therefore employs methods

which record several metabolic products of a hazardous substance at the same time, or several methods in parallel, in order to obtain the most comprehensive picture possible of the exposure situation under consideration.

The spectrum of detection provided by biological monitoring at the IPA is wide, encompassing a large number of metals and organic compounds. The spectrum also includes carcinogenic substances (such as aromatic amines, PAHs, acrylamide) and teratogenic and reprotoxic substances (such as phthalates, bisphenol A) and their metabolites. Reaction products of the hazardous substances, such as haemoglobin adducts or DNA adducts, can also be determined, as can parameters which record the onset of biological effects (such as damage to the genetic material).

Of key significance for the coming years is the IPA's participation in a Europe-wide EU project for biomonitoring: COPHES – Consortium to Perform Human Biomonitoring on a European Scale. The aim of COPHES is to establish biomonitoring in all EU Member States as an additional instrument for preventive healthcare, and to raise it to a comparably high level. Two German institutions, the Federal Environmental Agency (UBA) and the IPA, are responsible for two core work packages of this initiative. The IPA for example is addressing both the harmonization of analytical methods and quality assurance, and issues of the pre-analytical phase and biobanking, i.e. the creation of repositories for biosamples such as blood, urine, etc. At present, a Europe-wide interlaboratory comparison programme (ICI) is being set up which is to assess the participating laboratories and support the entire COPHES process. Three series of round-robin tests within this ICI are planned for 2011. The results will greatly contribute to European-wide harmonization of biomonitoring.

[www.ipa-dguv.de](http://www.ipa-dguv.de) (Webcode 542208)

[www.eu-hbm.info/cophes](http://www.eu-hbm.info/cophes)



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“Biomonitoring is currently the most reliable method for the measurement of human exposure to hazardous substances. It detects not only the theoretically possible but also the actual hazard to human beings.”

**The study is to deliver important findings for the quantification of occupational and non-occupational exposure to UV radiation.**

## UV radiation exposure at workplaces

### News on prevention and assessment


Workers may be exposed to optical, i.e. ultraviolet (UV), visible and infrared (IR) radiation at a whole range of workplaces. Besides outdoor work, these include welding, work with gas burners, the ultraviolet drying of coatings and adhesives, and the use of laser radiation. Excessive exposure to optical radiation can be harmful to health, for example by causing flash blindness, burns to the skin and the retina, opacification of the lens, and in the worst case, skin cancer. The use of suitable protective measures is of great importance at such workplaces. The Institute for Prevention and Occupational Medicine (IPA) and the Institute for Occupational Safety and Health (IFA), both of them institutes of the DGUV, are concerned with both aspects: the mechanisms leading to disorders, and their prevention.

Since July 2010, the OSH Ordinance on artificial optical radiation has been in force. This ordinance transposes EU directive 2006/25/EC into German law. Further substantiation is planned in the form of a technical rule pursuant to the Ordinance on industrial safety and health. The ordinance applies to incoherent optical radiation, such as that emitted by UV radiators, arcs and furnaces, and to laser radiation. The employer must identify and assess workers' exposure to optical radiation in a risk assessment. Should the exposure limit values be exceeded, protective measures must be taken. Performance of the risk assessment and application of suitable measures require detailed specialist knowledge. For this purpose, the German Social Accident Insurance Institutions and the IFA offer support to companies on the Internet and through publications, exposure

measurements, consultancy and events. To determine UV exposure among seamen and during work involving welding and gas burners, the IFA is currently conducting research projects in conjunction with a number of partner bodies.

To date, instruments have not been available by which the clinical and dermatological damage caused by optical radiation can be recorded and quantified, and by which occupational and non-occupational exposure to UV radiation can be distinguished from each other. These instruments are currently being developed in a multicentre study in which the IPA and the IFA are involved. The study is to deliver important findings for the quantification of occupational and non-occupational exposure to UV radiation. The instruments developed in the first phase are first to be validated in the five study centres in Bochum (IPA), Dresden, Heidelberg, Jena and Osnabrück by a survey of a total of 200 test subjects. They will then be used with larger collectives. A further objective is to formulate criteria by which the instruments can be applied in the production of expert reports on cases of skin cancer which may or may not be of occupational origin. The results from the research project are to be used, among other things, in recommendations for expert reports, for example the Bamberg Medical Bulletin and the guide for formally recognized occupational disease case workers and the technical inspectorates.

**[www.ipa-dguv.de](http://www.ipa-dguv.de) (Webcode 541696) and [www.dguv.de/ifa](http://www.dguv.de/ifa) (Webcode d13473)**



Prevention also means:  
**Rolling up sleeves.**

# Reducing noise exposure in railway operations

## Engine drivers in shunting duty are exposed to considerable levels of noise

Noise exposure for employees in railway operations is to be anticipated, especially where loud engines and fans are in operation in close proximity to employees. This particularly applies to workplaces on diesel-powered tractive units. When these vehicles are used on train duty, the driver is seated in a cab where he is relatively well protected against noise. In shunting duty, tractive units are now generally equipped with radio remote control. This enables an engine driver to assume the tasks of both engine driver and shunter at the same time. In this case, the engine driver/shunter is exposed to noise from a number of sources: engine and fan noise, particularly when riding on the outside of the tractive unit; the noise associated with the coupling and decoupling of rolling stock, caused in part by the release of compressed air; the sound of whistles for the warning of other traffic, particularly on company sites; and finally, the radio traffic required for communication.

The Institute for Occupational Safety and Health of the DGUV (IFA) supervised approximately 20 working shifts in an initiative launched by the former public- and private-sector institutions for statutory accident insurance in the railway sector. The purpose was to measure the average noise exposure and to identify the relevant sources of the noise. The results of measurements taken on passenger train duty show, as expected, that hazardous noise exposure does not normally occur on modern tractive units. Whistle signals at unguarded level crossings, as are often required on rural routes without good visibility, may however lead to noise exposure exceeding the maximum permissible exposure level of 85 dB(A).

During shunting duty, the measurements revealed exposures above the action values specified for the daily noise exposure level in the German Ordinance on Noise and Vibration Protection (LärmVibrationsArbSchV). Measures must therefore be taken to reduce the noise exposure. Fundamental engineered measures for noise abatement are possible only during the design of new tractive units. In accordance with the ranking of protective measures, existing workplaces therefore require organizational measures with the objective of reducing the periods of noise exposure, and as a last resort, the use of personal hearing protectors. For railway operations, however, the supervisory authorities permit the use of hearing protectors only when it can be demonstrated that all warning signals can still be heard when they are worn. The aim of further studies will now be that of developing methods for the selection of hearing protectors which enable acoustic warning signals to be heard reliably.

## Prevention on the web

Further information and resources relating to the chapter “Chemical, physical and biological hazards” have been compiled here.

### ► Shift work

[www.dguv.de](http://www.dguv.de)

Webcode d105787

### ► Nanotechnology

[www.dguv.de](http://www.dguv.de)

Webcode d92133 / d90477 / e95204

## Contacts

The DGUV is happy to provide assistance. Contacts are listed below for the various topics in the chapter “Chemical, physical and biological hazards”.

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Prevention also means:

**Playing a part –  
at whatever age.**

# EFFECTS OF ECONOMIC AND POLITICAL INFLUENCE

Is prevention worthwhile for enterprises? And what do standards have to do with social responsibility? Modern preventive activity must also be reflected in economic and political discussion processes, and must offer new approaches.

## Ageing, gracefully

### Demographic change: retaining fitness for work, exploiting existing potential

“The astonishing drop in overall unemployment since the economic crisis, the difficulty of bridging the gap between the skills that are needed and those possessed by the unemployed, and the unavoidable demographic hiatus from 2015 onwards cannot be ignored.” This is how the German Institute for Economic Research (DIW) describes the current situation on the labour market, inferring from this that in the medium term, the shortage of skilled personnel will become the key issue of economic policy. The latest calculations by the German Federal Office of Statistics have raised awareness of the issue in industry, government circles and society as a whole. Whereas initially, attention was focused upon the prognoses for demographic trends which would have their impact in the middle of this century, it is now clear that the course of future development must be set by the beginning of the present decade.

The baby-boomers of the 1960s are now ageing, and yet are still occupationally active – and need to remain so for some time to come. How this is to be achieved triggers questions regarding specific solutions. Ultimately, the task is that of coping in good time with the looming consequences of an ageing society. Here too, the principle of prevention applies. Good working conditions, workplace health promotion, and regular further training are the best ways of ensuring that people remain fit in their vocations through to retirement age.

In order to address the shortage of skilled personnel by keeping existing personnel fit for work, the German Social Accident Insurance Institutions are tackling the issue from the perspective of the structuring of work. With the aim of open-

ing up employment to all age groups, the DGUV’s brochure for small and medium-sized enterprises (SMEs), “The secret’s in the mix”, points for example to specific areas where action is needed. Strong demand for this publication shows that it has hit the button.

In addition, the opportunities available for a change of occupation were the subject of a workshop discussion organized by the DGUV and the German Academy of Sciences Leopoldina on the topic of innovative career paths. The Institute for Employment Research at the German Federal Employment Services (IAB) and the West German Trade Council also presented papers. In its iga project: “My next occupation”, the Institute for Work and Health of the DGUV (IAG) takes up these considerations for occupations which are difficult to pursue through to the statutory retirement age despite concerted prevention efforts. Successful changes in task or profession are described for selected vocations. The German government’s report on creating a world of work geared to older employees has adopted the activities and projects of the accident insurance institutions for structuring work in consideration of an aged and ageing workforce. For this reason, the DGUV has proposed to its members that a working group be founded with the task of addressing the consequences of demographic change. The group met for the first time in March 2011 with the aim of pooling information and experience of suitable prevention activities in order to retain the fitness for work and employability of their insured members.

[www.dguv.de](http://www.dguv.de) (Webcode d36189)



**Prof. Dr. Cameron Mustard** is President of the Institute for Work & Health in Toronto (Canada), and lectures in the Faculty of Medicine at the University of Toronto. Mustard completed his doctoral training in epidemiology, health policy and behavioural sciences at the Johns Hopkins University in Baltimore. In 1999, he moved to the Institute for Work & Health, one of the world's leading research institutes for occupational safety and health and health protection.

## Understanding the costs and benefits of prevention is central to making the best choices

### Interview with Cameron Mustard, President of the Institute for Work & Health in Toronto

**Professor Mustard, for many years you have analysed the effects and impacts of prevention measures on economies. What are your main conclusions?**

Our Institute for Work & Health in Toronto was founded in 1991 to provide impartial research-based advice on effective methods for the protection of the health of workers. Our research is focused on both the causes and the consequences of work-related injury and illness. The economic impact of preventable work disability has been a central theme in the Institute's work. Across the developed economies, such as in Germany, the cost of preventable occupational injury and illness is estimated to approach 3% of gross domestic product. And within an economic sector within one country, we observe differences between employers that clearly demonstrate the firms with effective OSH programmes have a cost burden one third less than employers who do not address the preventable causes of work disability.

**The purpose of prevention activity is to prevent human suffering. With that in mind, should occupational safety and health not be a moral obligation, irrespective of economic issues? Why is the cost-effectiveness of occupational safety and health even an issue?**

Yes, both at the level of the employer and the level of the society, there is a moral obligation to act to eliminate the preventable causes of worker ill-health. Yet it is the case that not all prevention actions are equal. Some actions will result in greater health benefits than others and some actions will be more costly to achieve than other actions. Understanding the costs and benefits of prevention measures in occupational safety and health is central to making the best choices among many options.

**In your opinion, is it fair to say that well-planned prevention measures also benefit companies economically? If so, how can such potential benefit be identified or proved? What business economic parameters exist for prevention?**

Well-planned and well-executed prevention measures will absolutely return economic benefits to companies. The Institute for Work & Health, along with other national and international technical agencies, have been working for a number of years to develop tools to assist workplaces in measuring the costs and the benefits of OSH prevention measures. It is increasingly clear that an Occupational Safety and Health Management System is absolutely necessary for employers to effectively identify the preventable causes of work disability. In our view, many



## “Each of the ten elements of the prevention services provided by the German Social Accident Insurance Institutions contributes to the quality of prevention measures in companies.”

workplaces can make improved OSH prevention decisions by incorporating the measurement of the costs of work disability and the costs of OSH prevention programmes in their Occupational Safety and Health Management System.

### **In the industrialized countries of Europe, we are observing a steady increase in the average age of the working population. What influence does this have on the cost-effectiveness of prevention?**

The aging of the workforce in most developed economies is the result of two factors. First, the decline in fertility over the past 40 years has resulted in lower numbers of young adults entering the workforce. And second, many countries are raising the age of eligibility for retirement benefits with the consequence that many older workers will participate in the labour force at older ages. We do not, I think, have a clear picture of how the population burden of work-related injury and illness may change as the aging of the workforce progresses in the developed economies. On the one hand, older workers very often have long occupational experience, more competency in recognizing workplace hazards and a lower frequency of disabling injuries. On the other hand, aging can result in impairment in motor and sensory function which may, in some occupational settings, increase risks for work-related injury or illness. As one example, injuries resulting from falls represent a higher proportion of the burden of work-related injury among older workers compared to younger workers. In addition, the time required to recover from a disabling injury may be longer for older workers. As the workforces of the developed countries continue to grow older, we do expect to see some modification of prevention priorities to reflect the risk characteristics more common among older workers and an enhanced focus on the optimal means by which workplaces can support return-to-work in older workers.

### **In Germany, the German Social Accident Insurance Institutions offer a total of ten prevention services: Consultation, investigation, inspection, training, supervision by occupational physicians and OSH professionals, information and communication, accident prevention regulations, certificates, R&D results and incentive schemes. In your opinion, which of these measures are of the greatest economic benefit to companies?**

This is a very important question. Each of the ten elements of the prevention services provided by the German Social Accident Insurance Institutions contributes to the quality of prevention measures in companies. Accident prevention regulations and the enforcement of regulations through labour

inspection programmes establish a common standard of performance for all firms in an economic sector. Consultation, training, certificate programmes and economic incentive schemes are different means by which companies can meet and hopefully exceed regulatory standards. One central question is what proportion of prevention agency expenditures should be allocated to each of the ten elements of prevention services. Work currently in progress by DGUV to measure the quality of prevention services will be very helpful in informing the answer to this important question.

### **Concern is often expressed that occupational safety and health measures mean bureaucracy and competitive disadvantage for employers. Are you aware of findings on this issue?**

Well designed regulatory standards in modern economies should impose compliance costs on employers that are no greater than the full costs of occupational injury and illness. And it is the case in most economies that employers bear a fraction of the true direct and indirect costs of workplace injury and illness. The Institute for Work & Health has recently compared safety and health expenditures by prevention authorities in seven countries. Those countries with higher expenditures achieved greater reductions in the incidence of the preventable causes of work disability. Regulatory standards are an important strategy to reduce the economic burden of preventable occupational injury and illness and the benefits of this reduced economic burden are returned to employers, to workers and to society at large.



# Workplace prevention activity delivers economic benefits

**An international project is studying whether investments in prevention work also have economic advantages for companies**



When companies invest in workplace prevention activity, they generally do so in order to meet statutory requirements and to satisfy their social responsibility towards their employees. At the same time, however, they are acting in their own economic interests. A lower incidence of occupational accidents and disease may reduce the interruptions to business operations and increase productivity. The “Return on Prevention” project is examining whether expenditure on workplace prevention activity pays off financially for the individual company. For this purpose, a balance sheet is drawn up setting the costs of workplace prevention against the resulting benefits. The result enables an indicator, the “return on prevention” (ROP) or ratio of prevention benefit to prevention cost, to be calculated. This indicator expresses the potential for economic success of workplace prevention activity from the perspective of an individual business.

In 2009, a research project addressing the subject of prevention accounting from a theoretical and empirical perspective, led by Professor Dietmar Bräunig, drew up such a prevention balance sheet with reference to German companies. The companies were asked to estimate the costs and benefits of occupational safety and health, qualitatively and quantitatively. A return on prevention of 1.6 was calculated. The results prompted great interest, both in Germany and abroad.

The “Return on Prevention” project is now continuing the research work conducted to date in cooperation with the International Social Security Association (ISSA), the German Social Accident Insurance Institution for the energy, textile, electrical and media products sectors (BG ETEM), and the Institute for Work and Health of the DGUV (IAG). The objective is the creation of country-specific prevention balance sheets and a worldwide prevention balance sheet, and calculation of the respective returns on prevention. Standardized surveys serve as the empirical basis. One company per million employed persons is to be surveyed, but at least ten and at most 40 companies in each country. 29 countries have agreed to participate.

The results are to assist decision-makers in companies in planning future occupational safety and health measures. Prevention success and return on prevention demonstrate in an abstract manner whether and on what scale expenditure on workplace prevention activity constitutes an investment and presents advantageous economic potential. The opportunity thus exists for new importance to be attached to occupational safety and health in the context of company targets. In addition, the project results could have a significant role to play in prevention consultancy. Approaches are identified for further improvements to national and international OSH policy. An international concept for promoting prevention can then also be based upon monetary incentives for companies, independently of ethical and legal aspects.

[www.dguv.de](http://www.dguv.de) (Webcode d33190)

[www.dguv.de/iag](http://www.dguv.de/iag) (Webcode e101476)



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**“Investments in occupational safety and health also contribute to the commercial success of an enterprise. The results of our projects show the potential of such investments, and thus promote prevention.”**



# The new world of standardization products

## Besides traditional standards, a new form of product has emerged at standards organizations – and one presenting occupational safety and health with a challenge

Standards are an important tool in occupational safety and health. They are produced with the involvement of highly diverse stakeholder groups, such as manufacturers, operators, and OSH representatives. The last of these groups is actively involved on standards committees, or submits comments on the content of standards.

Besides traditional standards, new standardization products are increasingly emerging which can be grouped under the heading of “specifications”. These documents include CEN Workshop Agreements (CWAs) and Publicly Available Specifications (PAS). Although they are drafted under the auspices of standards organizations, they differ from traditional standards in that they do not reflect a consensus between all stakeholders. Originally, these specifications were intended for fast-moving sectors such as that of information technology, since they can be produced within a short space of time.

Increasingly, specifications are also being used to address health and safety topics. As a result, they become a subject of attention for occupational safety and health. KAN, the Commission for Occupational Health and Safety and Standardization, rejects the use of CWAs and PAS for regulation of these aspects, since such specifications present various problems in their production and use:

- ▶ During the drafting process (for example of CWAs), anyone is in principle able to participate, and not just representatives from Europe. Fees for participation are however frequently levied, and the meetings for these European documents may also be held outside Europe, which often gives rise to additional costs.
- ▶ Parties that are actively involved are best placed to influence the content. The chair of the committee, however, decides when a consensus has been reached and the document is to be published. As a result, the document may fail to consider the position of the OSH lobby. Further opportunities for appeal do not then exist.
- ▶ The involvement of the public at a comments phase is not mandatory for all specifications.

**The involvement of all stakeholders, arrival at a consensus between them, and various means of exerting influence (such as a public enquiry) are absolutely indispensable for the regulation of occupational safety and health. Traditional standardization is the (only) proper way to achieve this.**

In order for the German OSH lobby to carry its position through, at European and international as well as national level, KAN is preparing a position paper on the subject. In the medium term, KAN seeks a change in the rules for CWAs: the standards organizations’ principles for the creation of CWAs should exclude areas of occupational safety and health, and should always require a public comments phase.

Deutsches Institut für Normung e. V. (DIN) supports KAN’s position, and acts as a filter for Germany: where they regulate occupational health and safety interests, specifications from Europe and the rest of the world are not adopted into the German body of standards.

Experience with specifications in the past confirms that all that glitters is not gold in the world of standardization products. The short development times may initially be tempting, but are accompanied by major problems in the area of occupational safety and health.



# Corporate Social Responsibility

## Can social responsibility be made the subject of standards?

When topics are presented for regulation in Europe, the USA and Australia, the discussion always revolves around the key issue of how much state regulation is necessary for the purpose, and how much voluntary self-regulation could also meet the requirements. It will soon be clear whether, with ISO 26 000, “Guidance on Social Responsibility”, the International Standards Organization (ISO) has succeeded in reconciling these contrary viewpoints.

In November 2010, the standard was adopted into the international body of standards at a ceremonial event in Geneva attended by government and business representatives from a host of countries. A particular aspect was that in contrast to similar initiatives and agreements, this standard was based for the first time upon an international consensus. The guidelines of the standard describe what social responsibility means and how it can be implemented systematically within organizations. The standard is, however, not certifiable.

This viewpoint was expressed in a joint statement by the BDI (the Federation of German Industries) and the BDA (the Confederation of German Employer Organisations) in a statement issued jointly with the German government, the German Chambers of Industry and Commerce, and the German Confederation of Skilled Crafts and Small Businesses. With their statement, these bodies wish to preclude efforts to make ISO 26 000, like its familiar counterparts governing management systems, ISO 9001 and ISO 14 001, the subject of expansive certification processes. The status of the standard as a recommendation rules out quantitative and qualitative assessment. This view is not universally shared, however; Sweden, for instance, has adopted a different position. Undisputedly, each organization and its activities have an impact upon society. Precisely for this reason, the developing countries have high expectations of this standard.

In the interests of enterprise, Germany will create transparency in the use of ISO 26 000. The DGUV has begun contributing to clarification at an early stage. The section of ISO 26 000 governing occupational safety and health was limited to the necessary scope at the consultation phase. Since the recommendations of ISO 26 000 are consistent with current provisions governing occupational safety and health, their implementation does not in principle present problems. Following critical review, the “Organization of occupational safety and health” expert committee concluded that the introduction of an OSH management system, for which businesses are certified by the awarding of a quality seal, constitutes at the same time a guarantee that the requirements formulated in the relevant chapter of ISO 26 000 have been properly implemented. No further special measures which would equate to certification are therefore required for this part of the standard. The German Social Accident Insurance Institutions will advise their member companies accordingly regarding the implementation of ISO 26 000.



DR. EDITH PERLEBACH  
Central Prevention Division,  
Social Change and Demographics



**“Over 90 countries sent delegates to draw up ISO 26 000. Its significance for the social responsibility of organizations will become apparent in the future.”**



# Migration: overcoming language barriers

## Cultural differences may be an obstacle to OSH activities – the German Social Accident Insurance is researching how such obstacles can be overcome

According to the German Federal Office of Statistics, of the 82 million people living in Germany in 2008, 15.6 million had a migrant background. Behind these figures lie very different life stories. The group includes ethnic Germans with German citizenship, migrant foreigners, and of course their children, who frequently hold German citizenship themselves. 80% of people with a migrant background are from various parts of Europe. This figure includes Turkey (to date, still only a candidate for EU membership), which has been included in geographical Europe for this purpose. Family reunification is the main reason for migration in the majority of cases, but the search for work is often also a factor. The age group of 25 to 55-year-olds is therefore strongly represented. Approximately half of all people with a migrant background are gainfully employed.

As advantageous as it may seem to group people of foreign origin together for purely statistical reasons, this approach is often not constructive if the objective is to facilitate understanding in schools, training and workplaces. The primary objective is that of overcoming language barriers. A study conducted by the DGUV shows that differences in perspectives attributable to cultural reasons may be no less an obstacle to mutual understand-

ing at the workplace than inadequate skills. Such differences may give rise to an increased safety risk for the affected individuals, and also for colleagues, if they lead to a lack of knowledge and acceptance of occupational safety and health. For this reason, the German Social Accident Insurance has specified a number of occupational tasks and working areas in which it aims to identify the reasons for a higher safety risk amongst foreign personnel. In a number of projects, the Institute for Work and Health of the DGUV (IAG) is researching how language barriers may be overcome and understanding facilitated.

Together with the individual German Social Accident Insurance Institutions, the IAG will for example conduct a new project to review company procedures for their efficacy. In conjunction with the company health insurance funds, the Initiative for Health and Work – iga is also developing an intercultural company health management initiative that will take account of the interests of employees of other nationalities. It is also looking at schools: as part of a study, it is developing an intercultural training concept for labour inspectors and teaching staff.

[www.dguv.de](http://www.dguv.de) (Webcode d109785)

# Supervision in small businesses

## Evaluation of occupational medical and safety supervision

The accident prevention regulation (UVV) governing occupational physicians and OSH professionals offers companies with up to 50 employees a choice between standard supervision and the alternative form of supervision, and promotes safety and health activity on the employer's own responsibility. For companies with up to ten employees, a newly defined form of standard supervision which no longer makes provision for fixed deployment times has been developed.

Between 2005 and 2007, the German Social Accident Insurance Institutions for trade and industry and for the railway services introduced new arrangements for the supervision of small businesses. To ascertain how these regulations had been received and were being used in the companies, the German Federal Ministry of Labour and Social Affairs (BMAS) requested that the responsible accident insurance institutions evaluate the new arrangements for their suitability for application. An advisory board for supervision of the evaluation was created, comprising representatives of the state authorities, the accident insurance institutions and industry bodies. The advisory board was to evaluate the

performance of the measures, and their results. Even though the new arrangements for supervision of small businesses by occupational physicians and OSH experts were introduced only a few years ago, their essential effectiveness within the companies is already evident. Predominantly favourable to very favourable values were obtained with regard to the performance and documentation of risk assessments, implementation of measures resulting from them, and provision of health and safety instruction to the employees. This is highly significant, since the risk assessment and the measures derived from it form the basis for successful occupational safety and health activity within companies.

By contrast, the ad-hoc supervision described in greater detail in the accident prevention regulation is on the whole not yet being exploited on an adequate scale. One possible explanation is that appropriate circumstances for this arrangement did not exist in the period under observation; another is that employers have not yet been made sufficiently aware of the arrangement.

[www.dguv.de](http://www.dguv.de) (Webcode d69315 and e40315)



Prevention also means:  
**Staying in touch.**



# Mobile learning for professional drivers

## The Institute for Work and Health (IAG) is working on an information and learning system that can also be used by professional drivers whilst travelling

The demographic trend in Germany has for some years been causing a continual rise in the average age of the population. Professional drivers are also affected by this development: In the coming years, a shortage of new young drivers and a steady increase in the proportion of older drivers must be anticipated.

To keep both older and younger drivers healthy and in work for longer, steps must be taken to retain and promote their performance throughout their lives. Examples of suitable measures are promoting lifelong learning, drawing attention to stresses associated with the occupation, and supporting processes conducive to good health at work.

The project for the development of an electronic OSH information and tuition programme for long-distance professional drivers therefore seeks to ascertain whether the potential offered by these digital media can be exploited in order to communicate principles of occupational safety and health to professional drivers, and to do so at their mobile workplaces.

The project aims are to assure the quality of the teaching provision by means of media-based didactic methods for analysis, design and evaluation, and by preparing the learning content in accordance with particular teaching and learning objectives of the German Social Accident Insurance Institution for the transport industry. A target-group analysis formed the focus of the first phase of the project. This yielded a detailed profile, a description of the current status of how learning content, media skills and mobile terminal devices are used.

In the conceptual design phase, the results of this survey were used as criteria for preparation of the learning content and of the mobile learning software. Evaluation involves quality assurance of the learning software with regard to the comprehensibility of the OSH topics presented by it and their facility for implementation in daily work. Measurement takes the form of feedback from practice and knowledge exercises conducted over the Internet at the end of each learning unit.

The initiative is being conducted in cooperation with the German Social Accident Insurance Institution for the transport industry. It constitutes a sub-project within the joint project funded by the German Federal Ministry of Education and Research examining mobile learning, process-related informing and learning in changing working environments. The other partners within the initiative are the department of Educational Science and Media Education at the FernUniversität in Hagen, handylearn projects (a commercial company), and Bode, a haulage company in Reinfeld.

The first results from the project are anticipated over the coming months. They will show the extent to which the drivers' self-efficacy and their responsibility for themselves can be reinforced, and whether they have deepened their knowledge of stresses and strains in their sector and of measures for preventing them. The project term is set to end in the spring of 2012.

<http://mlearning.fernuni-hagen.de>

## Prevention on the web

Further information and resources relating to the chapter "Effects of economic and political influence" have been compiled here.

### ▶ Corporate Social Responsibility

[www.dguv.de](http://www.dguv.de)

Webcode d56972

### ▶ Return on Prevention

[www.dguv.de](http://www.dguv.de)

Webcode d33190 / e101476

### ▶ Commission for Occupational Health and Safety and Standardization (KAN)

[www.kan.de](http://www.kan.de)

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**400,000**

participants in initial  
and further training

**525,000**

safety delegates

**75**  
**million**

insured individuals  
in Germany

**110,000**

OSH professionals

**3.8**

**million**  
insured companies  
and institutions

**1.1**  
**million**

first-aiders

**Germany works. Safely.**



# Work – a safe assumption

## The statutory accident insurance system in Germany

Whether at work, in schools or higher education, in children's daycare facilities or in voluntary services: the statutory accident insurance system offers safety and protection. It is a part of Germany's social insurance system. All salaried employees, schoolchildren and students, children attending daycare facilities and voluntary workers, particularly those in the voluntary fire services, are generally insured automatically against occupational, school and commuting accidents and against occupational diseases. Altogether, around 75 million people in Germany enjoy such protection. The bodies responsible for the accident insurance system are the German Social Accident Insurance Institutions, which are organized on sectoral lines and maintain a local presence to serve the insured parties.

### The DGUV

The DGUV (German Social Accident Insurance) is the umbrella association of the German Social Accident Insurance Institutions for trade and industry and for the public sector. It assumes responsibility for the common interests of its member institutions and supports their tasks in the interests of both the companies and insured individuals. It represents the statutory accident insurance institutions in their dealings with policymakers, German (federal and regional), European and other national and international institutions, and with the social partners. It maintains its head office in Berlin and further offices in Sankt Augustin and Munich. It also maintains institutes and academies at sites in Bad Hersfeld, Bochum, Dresden, Hennef and Sankt Augustin. In addition, the DGUV is active in KAN, the Commission for Occupational Health and Safety and Standardization, which is funded by the VFA, the Association for the Promotion of Occupational Safety in Europe.

### Prevention activity of the DGUV

The statutory accident insurance system also has the function of preventing occupational, school and commuting accidents, occupational diseases, and work-related health hazards. Prevention is of decisive importance and is one of the statutory functions of the German Social Accident Insurance Institutions. The individual institutions perform inspection and consultancy tasks within the sectors for which they are responsible, oriented towards the actual hazard and exposure situations in the field. In addition, they have developed a package of needs-based prevention activities and services in recent years which are cost-effective, practical and efficient. In the area of prevention, foci of the association's work particularly include:

- ▶ Performance, coordination and support of joint measures and of research relating to the prevention of occupational, school and commuting accidents, occupational diseases and work-related health hazards.
- ▶ Preparation, formulation and updating of model accident prevention regulations; involvement in the issuing of accident prevention regulations, and measures for the assurance of legislative uniformity.
- ▶ Involvement in testing, certification and standardization at national, European and international level.
- ▶ Decisions concerning all fundamental technical and legal issues which ensure that the legislation is applied uniformly within the statutory accident insurance system, and the provision of expert consultancy and of information to the individual German Social Accident Insurance Institutions; promotion of the pooling of their experience.
- ▶ Drafting of principles and performance of initial, further and continuing training of employees of the individual German Social Accident Insurance Institutions and of their umbrella association, including the review and approval of promotion and aptitude examinations under the civil-service legislation and the promotion and coordination of initial and further training measures.



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