

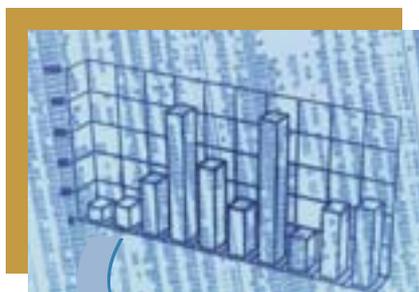


## SYSTEMS AND PROGRAMMES

How to convey OSH information effectively:  
**the case of dangerous substances**



European Agency  
for Safety and Health  
at Work



How to convey OSH  
information  
effectively: the  
case of dangerous  
substances



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## FOREWORD

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Dangerous substances contribute significantly to the 350 million days lost through occupational ill health in the EU, and to the seven million people suffering from occupational illnesses.

Action is needed to change the situation:

- 22 % of workers inhale fumes and vapours for at least a quarter of their working time.
- One study indicates that as few as 12 % of firms comply with risk prevention regulations regarding substances with known toxicological risks.
- Other research has found that safety data sheets provided by suppliers of dangerous chemical substances and preparations, the most available and most utilised source of information on chemicals, often do not comply with regulations.
- 96 % of all businesses in the chemical industry — some 36 000 firms in total — are small to medium-sized, with little or no toxicological expertise.

The Administrative Board of the European Agency for Safety and Health at Work therefore decided to dedicate the 2003 European Week for Safety and Health at Work to dangerous substances, including biological agents. It also agreed to include a study of examples of the successful provision of information about these substances in its 2003 work programme, in order to motivate or promote such initiatives. Accurate, comprehensive and exhaustive information is not only an employer's duty towards workers but also a prerequisite for carrying out the compulsory risk assessment and laying down preventive and protective measures against these risks. The majority of Europe's enterprises, mainly small and medium-sized enterprises (SMEs), lack either the information or the knowledge to make use of it.

This report describes 19 initiatives addressing the existing information gap. These cases cover not only worker information, but also the management and all the other relevant players at company level, occupational safety and health (OSH) experts, preventive services or worker representatives. Moreover, they also include actions taken by suppliers and their organisations and interventions of third parties such as trade unions, employers' organisations, or authorities. The programmes described range from company to sectoral, regional, national or even supranational level.

We hope that the report will be useful to those seeking to set up such schemes or develop existing schemes further. We also hope that it will promote awareness of existing initiatives and encourage organisations to participate in them. To assist this process further, the Agency has published a series of

information materials, including factsheets, a 'Forum' publication and 'Magazine' that are available on our web site at <http://osha.eu.int/ew2003/>.

The European Agency for Safety and Health at Work would like to thank the Agency Topic Centre, Nele Roskams from PREVENT Belgium, Kirsi Karjalainen from FIOH, and all the organisations who participated in this report for sharing their experiences. The Agency would also like to thank the national focal points and network groups for providing important knowledge and supporting contacts on the case studies and for their valuable comments and suggestions.

**European Agency for Safety and Health at Work  
September 2003**



# 1.



## INTRODUCTION

The European Week for Safety and Health at Work 2003 aims to promote awareness concerning hazards and risks related to the use of dangerous substances. Effective communication between the different actors involved in the use of dangerous substances, from manufacturer through intermediaries to end user, is crucial for the prevention of hazards and risks, but not easy. Published in the framework of the European Week, this report seeks to facilitate the development and dissemination of successful good practice examples and stimulate a wide range of activities in this area at European and Member State level.

Many workers are confronted with dangerous substances at work on a daily basis. Recent European research <sup>(1)</sup> found that 22 % of workers throughout Europe are exposed to dangerous substances for at least a quarter of their working time. Sixteen per cent of workers handle these substances daily. This implies that millions of workers across Europe are exposed to them.

Dangerous substances are used in various sectors and correspond to a vast amount of potential risks. The negative impact on workers includes occupational diseases such as asthma, cancer and dermatitis, affections of the heart, lungs, skin, intestines, kidneys and liver as well as harmful effects on the nervous and immune systems.

Comparing figures for the estimated levels of inhalation of dangerous substances throughout Europe and the number of European workers who indicate handling chemicals at their place of work suggests that workers underestimate exposure to dangerous substances <sup>(2)</sup>. Drawing attention to 'risk communication' as a part of 'risk management' is therefore crucial.

Raising awareness of workers cannot be effective, however, without fully integrating the other actors involved in the use of dangerous substances and the prevention of health risks related to these substances: actors at company level, prevention officers and employers, as well as intermediaries at regional, national and even supranational level.

Effective ways to reach these target groups should be examined.

### Legislative framework and new chemical policy

The EU regulations set out a legislative framework for the reduction of hazards associated with dangerous substances. Basic principles for the use of chemicals in the workplace are laid down in Directive 98/24/EC <sup>(3)</sup> (replacing Directive 80/1107) and Council Directive 90/394/EEC <sup>(4)</sup> on the protection of the health and safety of workers from the risks related to chemical agents and carcinogens at work. For biological agents, similar regulations are laid down in Directive 2000/54/EC <sup>(5)</sup> on the protection of workers from risks related to exposure to biological agents at work.

These rules focus strongly on providing information to workers concerning the risks of dangerous substances used in the workplace, training on safe working

<sup>(1)</sup> *Third European survey on working conditions 2000*, European Foundation for the Improvement of Living and Working Conditions, Dublin, 2002.

<sup>(2)</sup> *Forum 10 — Hazardous substances in the workplace — Minimising the risks*, European Agency for Safety and Health at Work 2003, available at <http://agency.osha.eu.int/publications/forum/10/en/index.htm>

<sup>(3)</sup> OJ L 131, 5.5.1998, pp. 11–23.

<sup>(4)</sup> OJ L 196, 26.7.1990, p. 1.

<sup>(5)</sup> OJ L 262, 17.10.2000, pp. 21–45.

methods, and on using effective communication methods to transfer the message to the workplace as an operative risk management tool.

**Worker information is a legal obligation of the employer.** Article 10 of the Framework Directive 89/391 of 12 June 1989 <sup>(6)</sup> on the introduction of measures to encourage improvements in the safety and health of workers at work states that employers are obliged to:

- inform and consult workers and allow them to take part in discussions on all questions relating to safety and health at work, including measures for first aid, fire-fighting, evacuation of workers and action required in the event of serious and imminent danger;
- ensure that each worker receives adequate health and safety training throughout the period of employment.

Moreover, employers shall inform not only their own workers and/or their representatives but also employers from any outside undertaking whose workers are engaged in work on their premises. The information should include the health and safety risks, and protective and preventive measures and activities, at both their workplace and the whole plant.

In addition, workers' representatives or workers with specific functions in protecting the safety and health of workers shall have access to the risk assessment and protective measures, the list of occupational accidents resulting in a worker being unfit for work for more than three working days, reports on occupational accidents, information resulting from protective and preventive measures, inspection agencies and bodies responsible for health and safety.

Article 8 of Directive 98/24/EC spells out more specific employers' legal obligations in relation to information on hazardous chemical agents occurring in the workplace. Information has to be given on:

- the identity of those agents,
- related risks to safety and health,
- relevant occupational exposure limits and other legislative provisions and access provided to any safety data sheet provided by the supplier.

Specific information requirements exist for carcinogens and biological agents, e.g. related to anonymous collective information including health surveillance.

Participation or consultation of workers or workers' representatives on the above information should be done in advance and in due time by the employer.

The information shall be provided to workers in a manner appropriate to the outcome of the risk assessment. This may vary from oral communication to individual instruction and training supported by information in writing, depending on the nature and degree of the risk revealed by the risk assessment. Moreover, it should be updated to take account of changing circumstances.

Employers also need adequate information for a successful risk assessment according to occupational safety and health regulations. Assisted by preventive services and eventually supported by intermediaries such as employers' or workers' organisations, they have to rely on information provided by suppliers and producers of chemicals. Both risk assessment and the decision about the control measures are a prerequisite to most information strategies.

<sup>(6)</sup> OJ L 183, 29.6.1989, p. 1.

For many of the chemicals placed on the market or used as intermediates some of the necessary data are currently unavailable. Since, to reduce the human health risks effectively, it depends upon the availability of data about health effects, there is only a limited possibility for the legislation to achieve its aim at the moment. Growing concern that the current system of regulating chemical safety does not provide sufficient protection has led to the development of a new European chemical policy. This policy aims to ensure a high level of protection of human health and the environment for the present and future generations and is outlined in the Commission's White Paper 'A strategy for a future chemicals policy' <sup>(7)</sup>.

One of its objectives is to convert the current system for existing and new substances into a single coherent system of registration, evaluation and authorisation (REACH), covering the majority of chemical substances. It intends to place the obligation on manufacturers, suppliers and importers providing a specific substance to inform users about the health and environmental effects, the safety measures, and usage. Owing to an increasing availability of quality information, negative effects on the health of users are estimated to be reduced <sup>(8)</sup>.

### **OSH communication on dangerous substances**

Among the problems and risks detected that are hindering a safe use of substances in every phase of its lifecycle <sup>(9)</sup> were the following:

#### *Unknown risks or insufficient awareness of risks*

- For many of the thousands of chemical substances on the market, essential data were not readily available.
- There was not enough understanding of the quality of the available data.
- The available data were often not accessible to the public.
- Suppliers were insufficiently aware of the risks they take, which can have consequences for third party users, such as employees.
- Also, because of this insufficient awareness and knowledge of risks:
  - risk assessment (risk inventory and evaluation) measures that employers are obliged to carry out are often inadequate;
  - control measures were taken only when the problems were already present and were often not sufficient.

#### *Lack of production-chain thinking in industry*

There is an obligation to share information along the production chain but, owing to ineffective communication and lack of cooperation within the supply chain, the effect is insufficient. This slows down the implementation of preventive measures.

#### *Unilateral allocation of tasks and responsibility*

- Authorities are responsible for the assessment of risks and the harmful effects on human health but lack the necessary instruments to meet this responsibility.

<sup>(7)</sup> [http://europa.eu.int/comm/environment/chemicals/0188\\_en.pdf](http://europa.eu.int/comm/environment/chemicals/0188_en.pdf)

<sup>(8)</sup> 'Assessment of the impact of the new chemicals policy on occupational health', European Commission, Environment DG, March 2003.

<sup>(9)</sup> For example, White Paper, 'Strategy for a future chemicals policy', European Commission, Brussels, 2001; *Strategy on management of substances*, The Hague, 2001.

- Within the current procedure of risk assessment of existing substances, reaching an agreement in Europe is labour intensive and time consuming. Only a few substances have been subjected to risk assessment and only a few risk reducing measures have been agreed upon within a European framework of classification regulations.

Under the present legislation, the industry has a 'duty of care' to ensure responsible management of risks but this duty is not detailed as concrete tasks.

In an introductory seminar to the European Week on Dangerous Substances held in Paris in 2002 <sup>(10)</sup>, specialists outlined that:

- effective risk communication goes beyond simply providing technical information at the workplace level;
- furthermore, the reaction on the part of workers has to be more than technical understanding;
- in the process of risk communication, understanding the relationship between hazards, the probability of a specific hazard occurring, and the perception of the hazard — influenced by economic, political, and social factors — are equally important;
- improvement of the awareness of end users must be accompanied by an increasing awareness of all stakeholders participating in the health and safety processes: the employer, the authorities (local, regional and national), professional occupational safety and health bodies, employer associations and trade unions, etc.

Lack of knowledge concerning hazardous substances is a widespread fact. The problem is often not the lack of data, which are available on the Internet or via the product information sheets provided by suppliers and manufacturers, but rather:

- the nature,
- the degree of complexity,
- the intelligibility,
- the accuracy, and
- the presentation of the information.

Since the target group are usually non-experts in the chemical field, communication must be understandable.

Translating or developing information focusing on the specific needs of the target groups mentioned above is complicated. The specific nature of each target group must be considered. This is why this report not only focuses on the type of information needed at workplace level but also on the best ways to transfer a specific message to a particular target group.

Following the selection of good practices involving the transfer of information on dangerous substances, the key elements for success were determined, analysed and compared to each other.

<sup>(10)</sup> *Hazardous substances in the workplace — Minimising the risks*, European Agency for Safety and Health at Work, Paris, 15 October 2002.

# 2.

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## THE REPORT

### **Aim**

The report focuses on dangerous substances in general, chemical substances and biological agents. Examples of written information sources (such as brochures, leaflets, etc.) are plentiful and readily available. Information and case studies focusing on the transfer of the information on dangerous substances to different target groups are harder to obtain. They should also describe how to evaluate the relevance of the information for these groups and how to make this transfer work in practice.

In gathering some of these case studies, the Agency aims to facilitate the development and dissemination of effective good practices and provide policy-makers, researchers, safety professionals, employers, and intermediary parties (such as the social partners) with useful information to support and adapt their approach with regard to communication concerning dangerous substances in the workplace.

### **Target group**

The main target audience of this report are persons who are involved in implementing occupational health and safety measures at workplace level. The report is mainly directed at employers, worker safety representatives, chemical suppliers and intermediary partners such as employer and worker associations, prevention services and industry organisations. Other secondary stakeholders are policy-makers involved in the field of dangerous substances, and people involved in relevant research.

### **Methodology**

Nineteen good practice examples from across Europe, demonstrating a successful approach in the transmission of information relating to dangerous substances, were chosen. The actions and activities selected differ in terms of the level of information and in the goals, actors and target groups. The selection was based on criteria such as the range of focus, the variety of actors involved, the choice and scope of media chosen, the main target groups and the goals of the case study. The report should cover all the elements intervening in the communication process.

### **Identifying success factors**

In the process of identifying success factors, recurrent elements have been distinguished within the various successful strategies and have been compared to one another. Similarities in the development of the projects, the scope of the action or the amount of support the action had from partners were all taken into account.

### **Structure**

The case studies on successful communication have been subdivided into three categories relating to the level at which the information was dealt with:

- case studies of effective communication methods within enterprises, e.g. to inform workers and workers' safety representatives of the hazards, risks, outcomes and preventive methods related to dangerous substances;

- case studies of successful approaches by substance suppliers to informing end users (enterprises) about the dangers and risks arising from the use of dangerous substances;
- case studies of interventions by third parties (local, regional, national, sector or social group level) of hazards and risks to enterprises and workers.

Following a short description of the nature of the cases, the report determines the main elements for successful strategies and substantiates the findings with examples from the case studies. An overview of the cases follows. The final chapter presents and discusses the key findings of the report.



# 3.

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## SHORT DESCRIPTION OF THE CASES

## (a) Cases at company level

### *Globally integrated process safety management at Lilly Development Centre — Belgium*

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*A wide range of information sources was designed according to the specific needs of every level in the corporate hierarchy*

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The wide variety and large quantity of hazardous substances is a significant risk for the health and safety of the workers of this pharmaceutical company. In order to reduce the accident level and better inform the workers, an integrated process safety management system assessing every possible risk was set up. A wide range of information sources was designed according to the specific needs of every level in the corporate hierarchy.

### *Informing workers about the hazards of chemical products — An example of an Italian chemical company: Polimeri Europa — Italy*

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*The company developed a unified system for the handling of materials from the moment they entered the plant until the moment they left*

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Polimeri Europa produces polyethylene products for the Italian and European markets. On account of a merger, restructuring of the company and improvement of human resources were needed. The company developed a unified system for the handling of materials from the moment they entered the plant until the moment they left. An information system to provide information to the workplace about the chemical risks of products was designed and implemented. It includes intelligible and easily applicable measures for workers.

### *Low-cost interventions — Substituting and eliminating hazardous chemicals and procedures — Greece*

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*The production process was completely redesigned after questioning the workers about the existing process and problems associated with it*

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To reduce the chemical risks in the workplace, Siemens Tele Industry SA sought to substitute the solvents used to remove the colophony from electronic boards for less dangerous substances and to eliminate the galvanisation process involving acids and solutions of metal salts. The cleaning of electronic boards in the production sector has always generated concerns because of the use of volatile alcohols. The production process was completely redesigned after questioning the workers about the existing process and problems associated with it.

### *Glanbia Ingredients — Involving the workers on substitution of a gas system — Ireland*

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*As the operations at the chlorine gas unit were associated with severe risks, the company sought to introduce a safer method of water disinfection after consulting the workers and following their suggestions*

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Glanbia Ingredients provides dairy ingredients for food manufacturers and for a variety of nutritional products. During the production process, the company uses chlorine gas as a disinfectant for the treated water supply.

As the operations at the chlorine gas unit were associated with severe risks, the company sought to introduce a safer method of water disinfection after consulting the workers and following their suggestions.

## (b) Cases at supplier level

### *Würth Oy audits on chemical safety for its enterprise customers — Finland*

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*The company launched free-of-charge audits for its customers. The audits include different steps in which the whole company of the customer is involved*

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Würth Oy is a leading wholesaler within the Finnish technical sector. In order to promote the sale of two of its environment-friendly product series, the company launched free-of-charge audits for its customers. The audits include different steps in which the whole company of the customer is involved. Most

customers are willing to cooperate, which improves the relationship between chemical supplier and customer, and their communication regarding products.

*Prevention and control logistics related to accidents caused by chemical substances and preparations — Italy*

The aim of this programme is to provide assistance in the event of accidents during road and rail transportation of chemical substances and preparations. An integral system that could cover a wide geographical region and would substantially reduce the time between notification of the accident and the intervention was introduced. The system is able to define the type of intervention according to the type and severity of the accident. The programme brought about contact for the first time between professionals in the industry, the public services, and the fire brigades. The personal relations that were established are invaluable in the event of accidents that demand a quick and effective response.

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*The programme brought about contact for the first time between professionals in the industry, the public services, and the fire brigades*

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*Checklists on the art of writing and reading safety data sheets — Sweden*

A leakage of acryl amide from a tunnel construction site brought to the attention the inaccuracies in the safety data sheets (SDSs) that were provided by the chemical supplier, the questionable quality of the SDSs as a widespread information source, and the lack of methodology for transferring the information to the workplace. After a survey on the quality of the SDSs, the Swedish Plastics and Chemicals Federation started a campaign to improve their content and the methods of informing the end users. The result was a checklist on how to make and read SDSs, which is freely available on the Federation's web site.

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*After a survey on the quality of the SDSs, the Swedish Plastics and Chemicals Federation started a campaign to improve their content. The result was a checklist on how to make and read SDSs*

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**(c) Cases of interventions by third parties (sector, regional, national and international level)**

*Sector initiative for an organic solvent-free printing shop (from Denmark to Germany and Europe)*

The aim of this action was to diminish the use of highly volatile solvents and stimulate the use of low volatility solvents. The initiative was started up on account of the high rates of neurological disorders among Danish printers. Lists of admissible, recommended solvents, on the one hand, and not-permitted products, on the other hand, were launched and will be updated every year. This sector initiative succeeded in reducing the number and amount of volatile solvents used.

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*The aim of this action was to diminish the use of highly volatile solvents and stimulate the use of low volatility solvents. The initiative was started up by Danish printers*

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*GISBAU — Support for the safe use of chemicals in the construction industry — Germany*

Set up in cooperation with the whole sector, GISBAU is an information system designed to diminish the risks from construction chemicals and to provide support to the many small and medium-sized enterprises (SMEs) in the construction industry. It offers comprehensive information about dangerous chemicals used in building, reconditioning and cleaning, including operating instructions, guidance and brochures related to the different work activities, and a coding system, the Giscode. One of the most important features of this support is the Wingis CD-ROM, used for risk management and for coding and

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*GISBAU offers comprehensive information about dangerous chemicals used in building, reconditioning and cleaning, including operating instructions, guidance and brochures related to the different work activities, and a coding system, the Giscode*

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labelling of dangerous products. The CD-ROM is one of the most successful occupational safety and health software programmes in Germany.

### *Evaluation of biological risks in the meat processing industry in Brittany — France*

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*The information obtained became the basis for developing a series of seminars and lectures on biological risks in the meat flaying and carving industry not only on a local but also on a national level*

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The action was initiated to identify and locate biological risks present in the meat processing industry. The company also hoped to increase the ability of workers to spot risk through general and specialised training at work, a new strategy for the reduction of risks and the introduction of protective measures. Risks were examined step by step and the aggravating and alleviating factors were determined. The information obtained became the basis for developing a series of seminars and lectures on biological risks in the meat flaying and carving industry not only on a local but also on a national level.

### *LAB-link — The human resource in the laboratory environment — Denmark*

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*The system combines conventional contact tools and modern Internet facilities. The result was a communication network centred around a web site*

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In order to stimulate the necessary dialogue on working environment matters in the laboratory sector, the Danish Laboratory Technicians Union created a system called LAB-link. The system combines conventional contact tools and modern Internet facilities. Several partners cooperated in the design of the system. The result was a communication network centred around a web site. The web site was created and is managed by an experienced webmaster who transfers specific questions from interested groups to the experts and answers questions by phone or e-mail.

### *Uvitech — UV curing technology in the printing industry — Belgium, France, Germany, United Kingdom*

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*The aims were to get SMEs in the printing industry interested in the use of UV curing technology, to reduce the risks of the dangerous substances used in the printing process, and to provide practical guidelines to SMEs*

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The European Commission supports this project in the framework of the EU's CRAFT development programme. The aims were to get SMEs in the printing industry interested in the use of UV curing technology, to reduce the risks of the dangerous substances used in the printing process, and to provide practical guidelines to SMEs. These companies are most of the time unable — owing to financial and organisational constraints — to implement measures optimising their health and safety protection concerning printing with UV inks and lacquers. Thorough examination of the developed protocol should also enable governmental bodies to regulate the printing industry more effectively.

### *Chemical and biological agents programme — Spain*

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*The Instituto Navarro de Salud Laboral undertook actions to promote health and safety at work, such as company audits and training courses for hygienists. It also published a guide on the Internet*

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The Spanish law concerning the prevention of occupational risks and the Royal Decree on chemical agents with regard to hygiene risks aim to promote the improvement of working conditions and to increase the level of protection and health of workers. In this framework, the Instituto Navarro de Salud Laboral undertook actions to promote health and safety at work, such as company audits and training courses for hygienists. In order to inform employers and workers about the risks and hazards of dangerous substances, it also published a guide on the Internet.

### *A national network of asbestos information centres — France*

In 1999, INRS set up a national network of centres against asbestos exposure. The objective was to coordinate the dissemination of information on the risks associated with asbestos removal from building sites in France. The action was

intended to cover all construction and public works sites in the country. The targeted groups in this sector included engineers, occupational physicians, health inspectors, technical students, and above all craftsmen and workers directly involved in asbestos removal.

*Strategy on the management of substances (SOMS): The experimental plots — the Netherlands*

In 1999, the Dutch government approved of a new chemicals policy and strategy: the 'Strategy on management of substances' (SOMS). To test it out in the workplace, to collect feedback, and to give companies the opportunity to experiment with the new policy instruments, 'experimental plots' (or 'test gardens') were set up in a corporate environment in association with several partners at corporate, supply-chain and sector level. The main goals of the two experimental plots described in the report were to improve the provision of necessary information to the specific target groups and their management.

*Safety and health strategy against biohazards — Austria*

The goal was to raise awareness about biohazards in sectors faced with various kinds of biological risks. Seven sectors were selected for campaigning (food production, agriculture, laboratories, hospitals, archives and libraries, work with waste and wastewater). To achieve the goal, the current situation in these sectors was analysed by experts, which led to a number of general hygiene and protection recommendations for all working areas. The results were measured in terms of the changes made at company level.

*COSHH Essentials — United Kingdom*

The aim of the action was to provide small businesses with practical guidance to fulfil the requirements of the 'Control of substances hazardous to health' (COSHH) regulations. The UK Health and Safety Executive developed a tool to monitor the risk assessment process step by step, which is most successful in its electronic version 'e-COSHH'.

*PIMEX (Picture mixed exposure) — Austria*

The project aims at improving working conditions through visualisation of exposure. The situation in a workplace is filmed with a video camera and presented on a computer monitor. At the same time, real-time instruments and sensors are attached to the worker being video-monitored. The exposure data, workloads and the corresponding medical data are recorded with direct reading instruments and inserted simultaneously into the video pictures. Video pictures and measured data are stored on the computer's hard disk and are available for further evaluation. All measurement results can be presented as moving bars, digital values, or a time diagram. This helps companies to make an easier, less expensive analysis of the workplace and to motivate workers to adopt changes in work procedures and working style.

*International chemical safety cards*

This information dissemination project created by the International Programme for Chemical Safety (IPCS), in cooperation with the European Union (EU), aims to provide essential information on chemicals, their properties and appropriate safety measures in a concise format to be used at 'shop-floor' level by workers and employers, and as a reference when preparing safety data sheets (SDSs). The original cards are available on the Internet free of charge in 16 languages.

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*The objective was to coordinate the dissemination of information on the risks associated with asbestos removal from building sites in France*

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*To test the new strategy, to collect feedback, and to give companies the opportunity to experiment with the new policy instruments, 'experimental plots' were set up with several partners*

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*Seven sectors were selected for campaigning (food production, agriculture, laboratories, hospitals, archives and libraries, work with waste and wastewater)*

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*The UK Health and Safety Executive developed a tool to monitor the risk assessment process step by step, which is most successful in its electronic version 'e-COSHH'*

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*The situation in a workplace is filmed with a video camera. At the same time, real-time instruments and sensors are attached to the worker being video-monitored. The exposure data are inserted simultaneously into the video pictures*

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*This project aims to provide essential information on chemicals, their properties and appropriate safety measures in a concise format in 16 languages*

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# 4.

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## DESCRIPTIVE TABLES

Table 1: Organisations involved in case studies

COUNTRY	CASES	INITIATORS AND PARTNERS					LEVEL OF ACTION				
		Public OSH organisations	Social partners and trade federations	Private insurance companies or funds	Private OSH organisations	Reference companies / test companies	International	National	Regional	Sector	Company
AUSTRIA	National strategy on biohazards	I			I	P		X			
AUSTRIA	PIMEX			I		P	x	X			
BELGIUM	Lilly development Centre					I					X
BELGIUM	UVITECH	I		I	P	P	X				
DENMARK	LAB-LINK		I/P	P		P				X	
FINLAND	Audits for chemical safety within enterprises					I		X			
FRANCE	Biological risks in the meat processing industry	P		I							
FRANCE	National network of asbestos information centres	I		I	P	I		X		X	
GERMANY	Branch initiative solvents in offset printing	I	I				X			X	
GERMANY	GISBAU	I	I				X			X	
GREECE	Low-cost interventions electronics industry	X			X						X
IRELAND	Glanbia Ingredients					I					X
ITALY	Polimeri Europa					I					X
ITALY	Prevention and control logistics		I			P	X			X	
NETHERLANDS	Strategy on management of substances	I (government)				P		X		X	
NETHERLANDS	Experimental plot lubricants	I				P	x	X			
NETHERLANDS	Experimental plot benchmarking					I					X
SPAIN	Chemical and biological agents programme	I/P							X		
SWEDEN	Checklist SDS		I			P		X			
UK	COSHH ESSENTIALS	I	P				X			X	
International	International Chemical Safety Cards	I/P					X				

Table 2: Case studies classified according to scope and focus of the actions

COUNTRY	CASE	SCOPE				Target group				
		Regarding sector			Regarding size of enterprises		Worker oriented	OSH personnel	Employer oriented	Other group?
		Company oriented	Sector oriented	Broad scope	targeted at SMEs	Mainly For all companies				
AUSTRIA	National strategy on biohazards			X		X	X	X		
AUSTRIA	PIMEX			X		X	X	X		
BELGIUM	Lilly development centre	X	X		x	X	X	X		
BELGIUM (*)	UVITECH		X			X		x	X	
DENMARK	LAB-LINK	x	X			X	X	X	X	Authorities, educational institutes
FINLAND	Audits for chemical safety within enterprises	X				X	X	X	X	
FRANCE	Biological risks in the meat processing industry		X			X	x	X		
FRANCE	National network of asbestos information centres		X	x	X	x	X	X		
GERMANY	Branch initiative solvents in offset printing		X		X	x	X		X	
GERMANY	GISBAU		X		X	x	X	X	X	X
GREECE	Low-cost interventions electronics industry	X				X	X			
IRELAND	Glanbia Ingredients	X				X	X	X		
ITALY	Polimeri Europa			X		X	X	X		
ITALY	Prevention and control logistics related to accidents	X		X	X	X	X		X	
NETHERLANDS	Strategy on management of substances			X	x	X	X	X	X	Consumers
NETHERLANDS	Experimental plot lubricants			X		X	X	X	X	
NETHERLANDS	Experimental plot benchmarking						X	X	X	
SPAIN	Chemical and biological agents programme			X		X	X	X	X	
SWEDEN	Checklists SDS	X	X		x	X	X	X	X	Manufacturers/suppliers
UK	COSHH ESSENTIALS			X	X	x		X	X	
EUROPE	International Chemical Safety Cards			X		X		X	X	

(\*) and France, Germany and UK

A large bold 'X' stands for the main focus, a small 'x' implies that this category is not a focus but is not excluded either.



# 5.

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EFFECTIVE COMMUNICATION  
STRATEGIES REGARDING  
DANGEROUS SUBSTANCES

## 5.1. INFORMATION AND PARTICIPATION OF WORKERS: A LEGAL RIGHT

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Worker information is a legal obligation of the employer. The information should address the hazardous agents occurring in the workplace (identity of those agents, relevant occupational exposure limits and other legislative provisions), the health and safety risks, and protective and preventive measures and activities. The content of the communication would depend frequently on the risk assessment and the measures to be taken and, if necessary, the protective equipment to be used. Moreover, information designed for first aid, fire-fighting and evacuation shall be given to the workers. So both risk assessment and decisions on the measures to be taken to prevent these risks are a prerequisite to most information strategies.

Information on dangerous substances may vary from oral communication to individual instruction and training supported by information in writing, depending on the nature and degree of the risk revealed by the risk assessment. It should be updated to take account of changing circumstances.

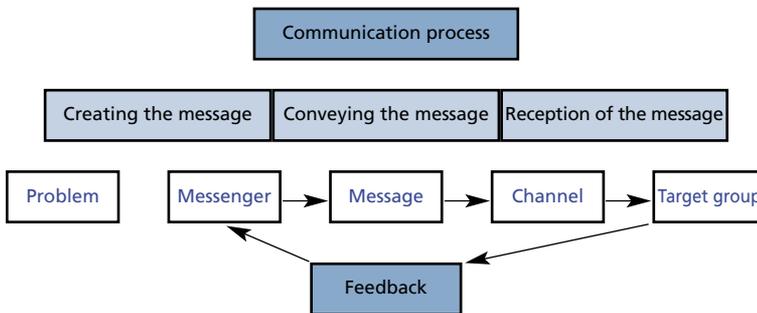
Access shall be given to workers or their representatives to any safety data sheet provided by the supplier.

More specific information requirements exist for carcinogens and biological agents. Participation and consultation of workers or workers' representatives on the above information should be done in advance by the employer.

# 5.2. ANALYSIS OF THE COMMUNICATION PROCESS AND SUCCESS FACTORS

In order to get a better view of the success factors and their position in the communication process, the report has been structured according to the basic communication structure in Table 4.

Table 4: The basic communication structure



Since every communication process should be dynamic, there are several expected and unexpected elements that can intervene in this process and influence positively or negatively the transfer and reception of the message.

In order to achieve the objectives successfully and to reduce unexpected features intervening in the transfer and reception of information, a thorough reflection is needed on the present situation, the characteristics of the stakeholders, the type of message and its content, the quality of the information and the dissemination channels. The following steps are not rigid chronological steps in time but interact and overlap with each other.

## DETECTION OF A PROBLEM

### *Analyse the present situation and possibilities*

The situation on the field has to be thoroughly analysed: what the starting point of the project is and why, in which context the project will take place, which group will be targeted, which problems have to be resolved, whether the necessary information is present and, if not, how it can be obtained, what has already been done, what tools are already available, etc. There has to be a shared understanding of the overall situation based on the study of problems and causes and the potential contributions to the communication process. After that, the actors should define and prioritise the needs.

## Defining the problem

The project **Checklists on the art of writing and reading safety data sheets** (Sweden), initialised by the Swedish Plastics and Chemicals Federation, was started after an incident with a chemical substance. The investigation of the incident led to the questioning of the entire safety procedures and of the quality of the information (SDSs) the procedures were based on. The SDSs were assessed one by one to determine the shortcomings and gaps in the transfer of information between all stakeholders before they started searching for solutions.

### *Initial audit to assess the situation*

In the **Würth Oy** case (Finland), the supplier of environment-friendly and safe products offers its customers free audits to assess the safety conditions in the company. The entire company process of the customer is examined and assessed. The representatives of the enterprise take a test on their actual knowledge. In a second phase, the auditor and the representative of the enterprise audit the workplace and the available products together.

### *Assessing the scope of the problem*

A precondition for good communication on dangerous substances is an accurate comprehension of the nature and scope of the potential risks and hazards.

One of the success factors of the **Uvitech** project was the fact that in its first phase the project members executed a complete assessment of potential risks in the selected printing firms. Not only were health and safety issues taken into account but also environmental issues. Based on this inventory of risks, the project provides SMEs in the printing industry with a template of recommendations to base their improvements on.

### *Former experience/knowledge*

Prior experience of communicating on dangerous substances, positive or negative, can be a valuable input for a new project.

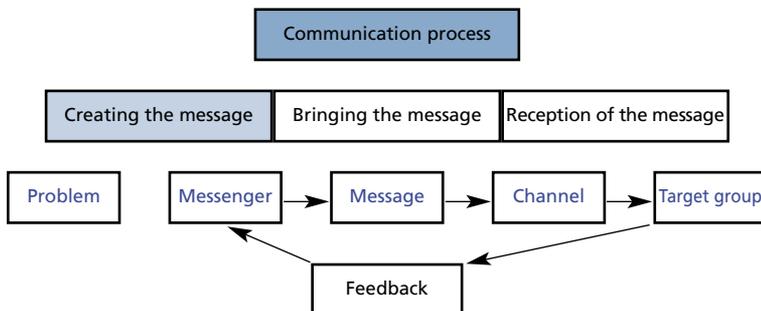
What worked well in the past, which methods did not have the envisaged effect, etc. are questions that can be used as a starting point in the new strategy or project. It is also possible that some data are already available and can be directly used as a basis.

The project **Experimental plots** (Netherlands) was based on some of the experiences gained with a previous project. Furthermore, for the experimental plot of the 'Benchmark project on chemical management and information systems', the cooperating company NAM had previous experience with the method of data collecting. The **Chemics+** tool that was already well developed and applied at NAM and some other companies was used for the assessment.

The **Uvitech** project used test methods that are nationally and internationally recognised.

**GISBAU** (Germany), one of the most successful OSH programmes in Germany, has been deeply involved in the development of branch agreements as, for example, for chromium reduced cement. It claims to have learned a lot from regulations in other European countries, for example for chromium from Scandinavian countries, for solvents from Austria, or for dust from the Netherlands.

## CREATING THE MESSAGE



### *Establish the objectives*

Considering the required outcomes is crucial to the communication process. A good message can only be fully effective if the goals have been determined. It is important to formulate realistic and concrete outcomes and it might be useful to determine the steps and timing for every result to be obtained.

### *Determine the target group*

Define which audience the message is addressed to and who should benefit in the end. The target audience and the beneficiaries are not necessarily the same. Intermediaries are sometimes used to stimulate the potential target group. Each target audience demands a different approach.

### *The content*

The content of the message should be designed or translated according to the needs and abilities of the target group. The language of the message and the language register used need to be considered. A target group never comprises a clear-cut and easily comprehensible homogenous whole. The broader the target audience, the more their features will vary.

Thought should be given to the tone of the message, the level of complexity, and the exhaustiveness of the message.

## Establish the objectives

The **Checklists on the art of writing and reading safety data sheets** (Sweden) considered the goals and required outcomes before proceeding to the next step. The initiators wanted to provide the users with good quality tools, to assess to which extent the SDSs cover all the risks and hazards that can occur. This implies that the tools have to be equally exhaustive, covering all the possible gaps and shortcomings that can be present in the SDSs and explaining how to avoid them. Therefore, the exhaustiveness of the checklists was evaluated several times by the chemical safety experts.

### *Use a consistent approach*

If a project is set up on different levels or in different sectors, a consistent approach in all areas is useful. A consistent work plan covering the aspects that will be treated helps to structure the project and ensures that the methodology and outcomes are measurable and comparable from one sub-project to another.

One of the factors that made the **Austrian biohazards** case (safety and health strategy against biohazards) successful is that the organisers first made an appraisal of the situation in the sector. Before starting, they assessed in which areas action was necessary and determined clearly the risk assessments and actions that had to be undertaken, the means that were available, etc. After that, every sub-project was set up in the respective areas of interest.

### **Reflect upon the content of the message**

#### *Translate the message to the specific company context*

Workplace information is mostly based upon extensive safety data sheets (SDSs) and legislative texts. Legislative texts and SDSs, however, are often too comprehensive and thus inadequate for daily use by employees working in a specific context. They have to be analysed, compared and summarised, for example, in instruction cards, adapted to the specific needs of the workplace and the company context.

The instruction cards of **Lilly Development Centre**, a pharmaceutical research and development company that employs about 400 people, are a good example. Moreover, as it is an international company with headquarters in the United States, it has to cope with European/Belgian and US regulations, which are brought together in a manual available on the company's intranet. Hence, the instruction cards combine the codes and colours of the US NFPA diamond, which contains a colour and figure code, the European pictograms, the R and S sentences in application for the specific dangerous substance, and additional information regarding the specific situation of the company. Thanks to the combination of the different systems, the communication process between the health and safety department and employees is facilitated.

In the **Würth Oy** case (audits for chemical safety within its enterprise customers, Finland), the objectives and the information itself have been translated to the needs and language of the customer enterprises' managers.

The audit process and the relevant areas that would be covered were clearly explained to the company management and flexible enough to comply with the individual needs of every company.

### **Exhaustive and complete information**

It can be crucial to the usefulness and reliability of the message that the information given is exhaustive and complete. This depends on the target group and the purpose of the information.

**GISBAU** (Germany) created a CD-ROM named *Wingis*, which contains SDS-like data on about 400 product groups and more than 20 000 substances or products. The CD-ROM not only provides single product information but also comprehensive and integrated product group information that allows the user to assess every risk present.

**Translate regulations and policies to the specific context**

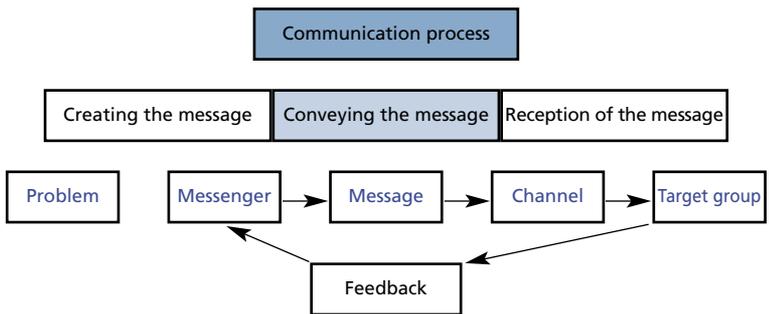
The **Uvitech** project has been implemented in six SMEs in four different countries in Europe so it will have to take the different legislations into account.

The **SOMS** project (Netherlands) was presented within the regulatory framework of European policy and tried to bring in enough elements of European policy into the Dutch legislation to guarantee the effectiveness of the new policy. Further, it brought together representatives from the environmental movement and the corporate world.

The **COSHH Essentials** project (control of substances hazardous to health regulations, UK), which aim to help SMEs with risk assessment by providing practical guidelines, reduces the complexity of legislative requirements. Considering the amount of guidance already present on the market, the COSHH Essentials were very successful. This seems to prove that the general approach as well as the style of presentation was well geared to the needs of the SMEs.

Since the **International chemical safety cards** are used worldwide, they have been translated into several major languages. The cards provide space to add the national legislative measures as well as other national viewpoints if necessary. In some countries (e.g. the US and Finland) they have been complemented for example by packaging, labelling and occupational limit value information.

**CONVEYING THE MESSAGE**



*The actors*

Identifying and engaging privileged partners that can support the design and implementation of the programme and have experience in the field not only guarantees quality and a better focus of the information but also adds to the credibility of the project and can facilitate the dissemination and impact of the information. Communication projects that invite collaboration between different partners from various backgrounds, specialities, networks, etc. enhance the value of the information and increase the authority of the project and its content. Support from the partners can be somewhat passive (allowing use of their name) or more active (providing funding or participating in the design and dissemination of the information).

### *The channel and use of the best available technical support*

The channel chosen to convey the message has to be selected according to the desired scope, the target audience, and the nature of the message.

The actors should make an inventory of the technical instruments available to transfer the message. Possibilities range from the mass media (press, television spots, etc.), to interactive means such as CD-ROMs, Internet sites, training sessions, seminars, and workshops, etc.

## The actors

### Cooperation between different partners

The **Würth Oy** project (Finland) was also popular among the customers because the audits were performed by experienced and trained auditors. The enterprise management felt that it could rely on the remarks and recommendations of the auditors. The fact that the audits were performed by an independent supplier and not by the authorities made the communication in case of Würth Oy (audits for chemical safety within its enterprise customers, Finland) more comfortable and open.

To regulate the activities of the **Transport emergency service (TES)** programme (prevention and control logistics related to accidents caused by chemical substances and preparations, Italy), Federchimica, the Italian Chemical Industry Federation, which is part of the European Chemical Industry Council, has an agreement with the Department of Civil Protection of the Prime Minister's Office and the general management, civil protection and fire-fighting services of the Ministry of the Interior. The participation between industry, public services and fire brigades lifted the communication to a higher level, allowing safety engineers to better design transport processes for chemicals.

In the case of the **Checklists on the art of writing and reading safety data sheets** (Sweden), the Swedish Plastics and Chemicals Federation received support on the content from their members as well as from the authorities. The fact that different credible partners gave their opinion and expert guidance facilitated the recognition of the checklists as a valuable instrument. The case study also mentions the openness towards the partners and the willingness to consider any feedback as elements that increased the quality of cooperation. This of course has an impact on the achievements of the project.

### Engaging partners to support the action

In order to reach the target audience beyond the company, **GISBAU** (Germany) attracted other partners to create a broad platform for support and communication.

Delivery of the information, in order to support the construction industry in dealing with chemicals and to reduce the risks, is only possible thanks to the cooperation of the social partners and the producers. The GISBAU approach is also supported by the four main producer associations for paints, adhesives, cleaning agents and construction chemicals.

In the **Experimental plots** project (Netherlands) the Dutch government and Dutch industry collaborate on the process of collecting and exchanging information, so they can rely on a large information network. The aim of the

plots is to assess what kind of dangerous substances' information is available. In order to communicate the right information to every party involved in the lifecycle of the dangerous substances, they also determine what is missing and how information is organised at present. A broad partner network was necessary to gather as many experiences as possible.

The **Uvitech** project is supported by three different national institutes for occupational safety and health. Other than this, the project coordinator has involved eight industrial partners, six printing firms and two research institutes.

The **Branch initiative for a solvent-free printing shop** is an initiative of the statutory social insurance organisation ('Berufsgenossenschaft Druck und Papierverarbeitung'), the employers' association ('Bundesverband Druck') and the printers' union (IG Medien).

In this case, the participation of the printing machine producers incited the other equipment suppliers into committing themselves too, and was crucial to the success of the project. In addition, the representatives of the employers and employees became contributing parties.

All the participants who took part in the project about the **Evaluation of biological risks in the meat flaying and carving industries in Brittany** (France) — the Regional Health Insurance Fund, the National Institute for Scientific Research and the Committee for Hygiene, Safety and Work Conditions — fulfilled their roles in instigating, coordinating, facilitating and executing the different phases of the project. Several meetings were therefore organised.

The National Institute for Research and Safety (INRS) took the initiative to create a **national network of asbestos information centres** (France), but in fact several organisations are involved in this project. These include, among others, the Regional Health Insurance Funds (CRAM), the National Fund for Sickness Insurance of Employees (CNAMTS), the Ministry of Labour and Solidarity, the Professional Organisation for the Prevention of Health Risks in Buildings and Public Works (OPPBTP), the Confederation of Tradesmen and Small Construction Enterprises (CAPEB), the French Construction Federation (FFB), the National Federation of Labour Cooperatives for Building and Public Works (BTP-SCOP), and the National Federation for Public Works (TP). The success of the action was guaranteed by the support received by all partners in publishing and distributing the basic leaflet on asbestos risks. This large partner network operating on different levels ensured a good coverage of the target groups. Not only was the wider public reached but the solitary workers who normally do not have easy access to this information were also reached.

In developing **COSHH Essentials**, the Health and Safety Executive (HSE) worked with the Confederation of British Industries (CBI) and the Trade Union Congress (TUC).

The Spanish case on the **Chemical and biological agents programme** was executed and supported by three major expert partners. The audited companies received expert guidance on how to improve working conditions.

The **International chemical safety cards** (IPCS) rely on a well structured and very competent organisation that collects, reviews and presents information. It was set up as a collaboration between the International Labour Organisation (ILO), the World Health Organisation (WHO) and the United Nations Environment Programme (UNEP). The IPCS member states and external expert

institutes can propose new chemicals that have to be included in the peer review. The contact persons of the peer review group are able to cover several areas of know-how and follow the worldwide discussion on chemical hazards, and select priority chemicals for international chemical safety programmes. The translated cards are available on the web site of the ILO and the US National Institute for Occupational Safety and Health (NIOSH).

### Financial support

As demonstrated above, support can be focused on collaboration in the execution of tasks, on financial support or on both. Financial support can be provided by the participating partners or by sponsors who do not actively participate in the development and transfer of the information.

The selected **Experimental plots** of the Dutch SOMS case were partly subsidised by the government and gave the individual experimental plots the opportunity to invest more time and effort into the project.

The **GISBAU** case for the safe use of chemicals in the construction industry is provided freely to companies in the construction industry. The project is especially directed at SMEs, which usually have fewer resources. The CD-ROM enjoys a huge success in the sector.

### Select the channel and use the best available technical support

The means available to bring the information about dangerous substances to the public are just as important as a clear and understandable message. Depending on the target public and the nature of the message some tools or methods are more effective than others.

#### Training sessions, workshops, seminars, and permanent or mobile information stands

In order to communicate changes in the production process, risks or measures to the target group, training sessions, workshops and/or seminars can be organised. It is recommended to test the understanding of the information transmitted during a seminar, training or workshop.

Furthermore, a permanent or mobile stand where workers/people can freely ask questions or can acquire information about the risks of dangerous substances is of great value in a communication strategy. Permanent stands are usually situated in places accessible to a large number of persons. Mobile stands can easily be transported to various events. The choice of the location is extremely important. Initial questions that need to be asked are: what is the target audience, where can I reach them, and which tools would be the most effective?

The possibilities for training sessions, workshops and seminars are unlimited. The content can be adapted to the specific needs of the participants. Since workers, managers, etc. may be inundated with information, the message needs to be to the point and well balanced in terms of length and complexity.

At **Polimeri Europa** (Italy) training courses and seminars are organised in order to teach aspects of health and safety in the workplace and the necessity and importance of using the intranet databank, which contains an SDS database and a database of hazardous substances. The database can be used to retrieve information for a substance or preparation by typing one or more of the

characteristics of the substance (product name, CAS number, index name, EC number, risk phrase, safety phrase, label, or last revision).

Workers and technicians at **Siemens Tele Industry** (Greece) attended instruction sessions and training courses to familiarise themselves with the changes in the production process.

**Würth Oy** (Finland) organised practical training sessions for the workplace to allow workers to use and select SDSs relevant to their job.

To communicate the replacement of highly volatile products by low volatile products in the printing industry, the German **Branch initiative for a solvent-free printing shop** organised training schools, workshops and seminars.

The results of the **Safety and health strategy against biohazards** project (Austria) were presented in the workshop 'Biological agents in Austria — A major risk?'.

During the project **National network of asbestos information centres** in France, the Regional Health Insurance Funds (CRAM) organised initiatives such as education sessions and seminars. Furthermore there were promotion days, exhibitions for craftsmen, special topic days, etc. Permanent and mobile stands were also set up. In the vast majority of situations, static stands were used. In a smaller number of stands, videotapes were distributed. In parallel, promotion days, general meetings and training sessions were organised. The kind of information as well as the flexibility of the stands depended on the target public. The stands were placed at spots where those who are the most concerned with these issues are regularly present. Examples are local occupational health institutions carrying out compulsory health surveillance and outlets (the so-called POINT P shops) for the purchase of construction materials for professionals and non-professionals.

### Giving practical demonstrations and examples

Visualising the information to be communicated serves to connect the target audience with the message. It also adds to the understanding of the communicated information.

Demonstrations, practical examples, etc. work very well if practical knowledge needs to be acquired. However, even if it concerns theoretical knowledge, the message will be more effective if accompanied by an example.

Demonstrations make it possible to show good and bad practices, include testimonies from victims of accidents or illnesses, etc. Although dissemination of practical examples on a broader level can cause more organisational difficulties because the target audience will be greater, demonstration of the information with practical examples has proven to be a valuable method.

During the Safety Day of **Lilly Development Centre** (Belgium), workers could discover and test the prevention and protection systems and the equipment used at the plant. This improved the involvement and identification of the workers with the safety measures they have to follow.

The **Branch initiative for a solvent-free printing shop** provided demonstrations inside companies on the new working method. As printers like to learn from printers, the demonstration inside companies enjoyed the most success.

The **PIMEX** method used in Austria is the most evident example of visualisation of risks. The worker is filmed at his workplace and, at the same time, his

exposure is measured and converted to a diagram inserted into the picture. These videotapes can be used for worker training as well as for risk assessment, visualising for example which steps of the work procedure involve the highest exposures to a certain dangerous substance.

### Tools

In order to transmit the information to the target group, easily accessible tools should be made available. Workers for example do not need a lot of jargon or theoretical information but concrete and specific knowledge that can be applied directly to their situation. The usability of the tool is important to make sure it really is used. The tools also need to be easily accessible for the group that will be working with them. If necessary, the target group should receive training on using the tool in a suitable way. A wide variety of tools exists: intranet, leaflets, safety posters, safety manuals, SDSs, CD-ROMs, databases, questionnaires, etc. Not every project benefits from the same kind of tools and channels to disseminate the message. These should be selected according to the context.

At the **Lilly Development Centre** (Belgium) employees are made aware of the risks and hazards present in the company and of their responsibilities through posters and manuals. The tools are designed according to the specific level of the employees. Safety posters are put up around the workplace at strategic places. These posters concern the safe use of dangerous products and good practices regarding storage and handling of substances and basic hygiene rules. Manuals adapted to other workstations and tasks are available to the workers concerned, such as laboratory workers. But of all the developed tools in the company, the intranet is the most important. It provides direct information to all members of staff about health and safety measures and protection of the environment. Furthermore, links enable the internal information to be connected to more general information on the intranet as well as the Internet. The SDSs are also available on the intranet.

**Polimeri Europa (Italy)** developed an intranet system that is easily accessible at all production sites in Italy or abroad. This system contains a safety data sheet (SDS) database and a database of hazardous substances. The SDS database system enables the employee to group substances of preparations according to one or more common characteristics or to their origin. The management of both databases is centrally coordinated and the information is continually updated according to changes in legislation. To be able to use the databases in an appropriate way, training courses and seminars are organised, and manuals and additional information material is provided to the employees.

At **Siemens Tele Industry** (Greece) (the substitution of chemicals by less dangerous substances), new technical guides were issued due to changes in the production process. A questionnaire was distributed to the employees to assess if the changes proved to be efficient (reduction of headaches, nausea and dizziness). Instructional boards displaying measures of protection and good practices were placed in the company.

At **Glanbia Ingredients** (Ireland), risks are made known to the workers via notice boards, the intranet, leaflets and SDSs. Warning signs are in place highlighting the risks involved in carrying out the task. Further, there is a safety statement containing a written account of all the risks and hazards on the site.

**Würth Oy** (Finland) uses audit reports combined with a concrete plan on how to update effectively the chemical data present in the enterprise. This report is

handed over to the company who can use it for future purposes. Labels inform the staff of the chemicals that cannot be used any more. The information shelves with safety data sheets are located near to the chemicals storage.

In order to support construction enterprises in dealing better with construction chemicals, **GISBAU** (Germany) developed a CD-ROM (called Wings) which contains SDS-like data on 400 product groups and more than 20 000 substances or products. Search functions make it easy to find the product or substance of concern — or at least to find information about the product group.

To inform the public, the **Branch initiative for a solvent-free printing shop** (Germany) sent out press releases and put articles in trade journals.

The **Safety and health strategy against biohazards** in Austria organised the distribution of detailed information folders for enterprises and practical sheets for the workers and employers.

The **National network of asbestos information centres** (France) provided information using tools such as leaflets, posters, videotapes and CD-ROMs. In order to ascertain the success of the action, the National Institute for Research and Safety (INRS) sent a questionnaire in 2001 to all the stands. Of these, 80.5 % responded and the information obtained was used to evaluate the action during the first two years and to make changes and improvements for the following year.

## Internet

In order to promote the **COSHH Essentials** guidance document, HSE distributed leaflets, placed adverts and set up an HSE Infoline enquiry service. Due to the success of the paper version of COSHH Essentials, HSE launched 'e-COSHH' in April 2002. e-COSHH is available free as part of 'hsedirect' — a database of all United Kingdom health and safety legislation.

The Spanish **Chemicals and biological agents programme** used the Internet to disseminate the basic manual on chemical products. Furthermore, in order to inform the municipalities and companies in the construction industry on the abolition and removal of materials containing asbestos, the organiser sent 1 500 informative cards accompanied by a practical guidance card.

**Lab-Link** (Denmark) is a system combining conventional contact tools and Internet facilities to provide the target group, in this case the laboratory sector, with expert assistance. Questions are answered via the phone, e-mail, or web site forum.

In order to disseminate the cards as widely as possible, the **International chemical safety cards** (IPCS) are diffused via the Internet. Since the cards are also of interest to workplaces in the developing countries that do not all have access to the Internet, a hard copy of the cards will be provided as well.

In the case **Checklists on the art of writing and reading safety data sheets** (Sweden), the action was centred on a checklist provided via the Internet to everyone interested. The initiators opted for a checklist because it is an easy and quick way to assess missing elements. The partners considered the Internet the best channel because it allowed the information to be disseminated quickly, made it available to a broad public, and raised the transparency of the action. This in turn led to interaction between initiator and partners, reliance between the partners, and increased national and international interest in the issue.

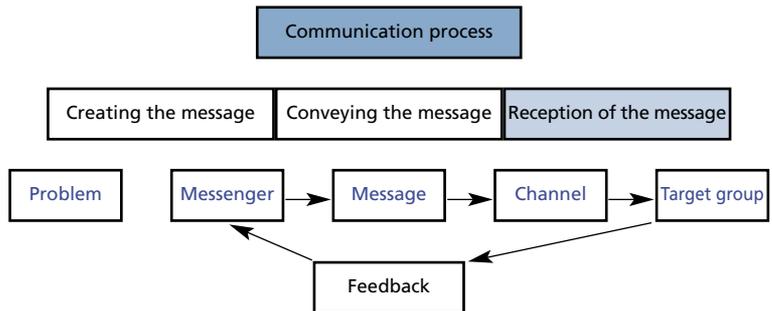
### Interactivity

Interactivity encourages users to be active participants in their own learning and engages them in the construction of knowledge.

The guidance that **COSHH Essentials** offers is not simply an explanation of existing regulations or an awareness-creating 'eye-opener'. e-COSHH is an interactive tool. It performs online risk assessments to give businesses practical solutions for their workplace. It simply asks users to input readily available information about the chemicals they use and the way that they use them. The system then automatically identifies the correct control solutions and produces easy-to-follow instructions on how to put the guidelines into practice and carry out other duties required by COSHH. The web-based system has hypertext links throughout so the user can reach other guidelines.

The **Lab-link system** (Denmark) is entirely based on interaction between the registered user on the one hand and the webmaster and experts on the other. On the web site forum, issues can be discussed with other users and/or experts. The system provides for expert assistance: via the Internet site, specific questions can be posted to the webmaster who decides which expert is able to give most information. Other features added to the web site are the hyperlinks guiding the user to other interesting sources and the interactive training material.

### RECEPTION OF THE MESSAGE AND COMPREHENSION BY THE TARGET AUDIENCE



The level of understanding depends not only on the educational level and skills of the target audience but also on whether they have received enough background information to understand the message. Other aspects such as interests and past experiences are relevant to the way the target audience comprehends the message.

#### *Raising awareness and involving the target audience*

It is important that the objectives of the action are clearly communicated to the target audience. Openness about the aims of the actions also stimulates interaction and cooperation from the target audience. Ensuring the benefits for the target audience outweigh the costs, and clearly presenting and explaining this, is an important stimulus in raising awareness among the target public.

*Involve the workers*

A good way of communicating a change in the production process (e.g. replacement of a dangerous substance by a less dangerous one) is to involve the workers in the change, so that they can follow the process step by step and feel part of the company structure.

At **Glanbia Ingredients** (Ireland) the workers were deliberately involved throughout the changing of the system so that they were completely aware of what was happening and could give feedback on the processes.

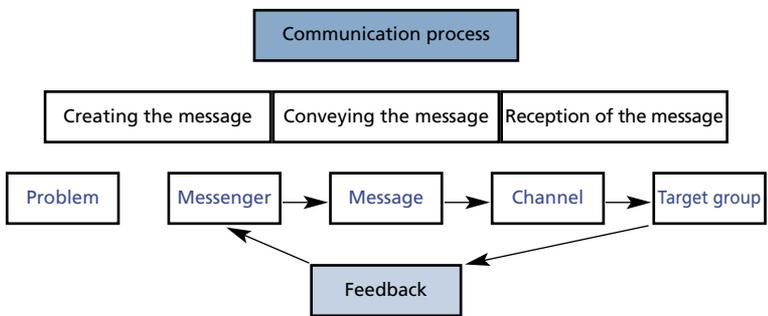
*Communicate overtly*

Würth Oy (audits for chemical safety within its enterprise customers, Finland) fully integrated the representatives of the customer companies in the process, shared all the collected information and did not restrict it to unilateral recommendations but focused on interaction between both parties. In this case study, however, one of the few problems that hindered good cooperation and communication in some cases was the fact that the companies did not always understand the exact purpose of the audits.

*Present costs and benefits to the target audience*

The fact that the audit is free in the case of **Würth Oy** is of course a benefit that is very interesting to the companies, who save money on the risk assessment they have to perform anyway. In addition, the enterprise manager received a report that summarised the entire executed process. Würth Oy included the benefits and costs in the promotion of the project towards their customers. For mostly economical reasons (not enough resources to perform the self-evaluations, privacy of the company processes), the smallest SMEs were especially difficult to convince of the benefits of this project and thus reluctant to invite an auditor.

**COLLECT AND FOLLOW UP FEEDBACK**



The response (or lack of response) from the target group reveals something about the reception of the message. By collecting and examining this feedback, one can assess the degree of understanding and the impact of the message and draw conclusions.

A distinction can be made between different levels of feedback: it can go from simple understanding and memorising, to adherence or concrete action.

Feedback should not be restricted to the response of the target group afterwards; it is needed during the whole communication process and should include all stakeholders. Collecting feedback during the project allows the content of the message to be adjusted if needed, leading to a better and more focused message.

Openness towards the partners and a readiness to adopt democratic decision-making during the creation of the project stimulates interaction, loyalty and confidence between partners.

#### *Evaluating the entire action*

Evaluating whether the overall action was successful can be done in several ways. The feedback and responses received can already give an indication. To evaluate the entire action, it can be useful to survey and question the different stakeholders and the target group. Collecting feedback at the end of the project provides useful input for future projects.

### **Audit and/or follow up**

To keep the quality of the communicated information intact and up to date, it has to be regularly checked. This checking procedure can be done throughout an audit — performed by the company itself or by another company — and/or a continuing follow up.

At the **Lilly Development Centre** (Belgium), a globally integrated process safety management (GIPSM) programme was implemented in 1998. Before implementation the company performed an audit to map out the problems, risks and difficulties that needed to be resolved. An interdepartmental group was created to assess, upgrade and improve the existing management systems. This group continues to follow up the results. To measure progress and potential problems, periodical audits are carried out.

In the **Würth Oy** case (audits for chemical safety within its enterprise customers, Finland), the initial audits were completed with self evaluations by the enterprise representative and a concluding *post* audit to assess the progress made.

During the process of developing the **Checklists on the art of writing and reading safety data sheets** (Sweden), feedback was given from the expert partners to make sure that the provided material was accurate and clearly presented.

The Health and Safety Executive (HSE) commissioned a consultant to undertake a survey amongst employers and organisations that had purchased a copy of the **COSHH Essentials** guidance document. Five hundred interviews were undertaken over the telephone during February and March 2001. The key aim in carrying out the survey was to assess if COSHH Essentials was really helping to improve chemical checks in SMEs.

The **International chemical safety cards** (IPCS) were tested several times during training courses of the United Nations in developing countries and were judged to be clear and understandable tools. New and updated cards are always forwarded for comments to more than 250 contacts.

**Bottom-up approach: consulting the workers, the company or the sector**

Workers possess practical knowledge concerning daily workplace circumstances and are usually well aware of the elements that can or have to be improved.

Therefore their suggestions and ideas are not to be overlooked in the communication processes of the company. The company structures can provide the right context to stimulate and involve workers. Informal face-to-face talks can have surprising outcomes and can stimulate employees to actively participate and reflect upon the daily operations. Decisions with important implications that are systematically made without consulting the worker alienates him/her from the company. The feeling of participating actively in the communication process and to be actually considered in the company stimulates workers not only in their motivation but also helps them to identify themselves with management decisions.

A good example of how workers at company level can be included in the communication process and can be encouraged to suggest improvements is the **Glanbia Ingredients** case (Ireland). During meetings, workers are encouraged to propose their ideas to their co-workers and line manager. It was during such an informal talk that one of the operators at **Glanbia Ingredients** (Ireland) made a suggestion for the removal of the chlorine gas dosing system and to replace it with liquid sodium hypochlorite using a simple dosing system. Following discussions with fellow employees and management staff, the idea was further developed and implemented on site.

Consultation of workers also seems to be an effective communication method in the **Lilly Development Centre** (Belgium). Feedback from workers is part of the IPSM programme. The workers are not only consulted during regular information meetings and evaluations but also before the implementation of new processes or equipment. The fact that workers feel their feedback is taken into consideration adds to their involvement in the company.

In the case of **Low-cost interventions to achieve a healthier work environment by substituting chemicals and eliminating procedures** (Greece), a permanent information exchange between the safety experts and employees for the design and functioning of the new processes was set up. The workers' comments were collected using a questionnaire. By means of this questionnaire, workers could assess whether their health problems had decreased or not.

Even in the case of a project with broader scope than the company level, a bottom-up approach is very constructive. Consulting the workers or the companies at stake, before working out a communication programme about dangerous substances, can be very useful to ensure that the information reaches the target public, corresponds to their information needs and is comprehensible for the target group. This adds also to the authenticity of the information that will be communicated.

In the case of **Uvitech**, six companies were contacted and consulted about the potential risks present in printing machines. To add to the legitimacy of the findings' recommendations, the project leaders selected several printing firms in four European countries, in order to cover as much as possible aspects that can interfere with the printing process.

The **Experimental plots** issued in the framework of the strategy on the management of substances (Netherlands) aimed at gathering information at sector level in order to improve the flow of communication inside the sectors and the communication from the government to the sectors. They opted for this kind of approach because they wanted to start from the reality and not from a hypothesis. Thanks to the participation of several different sectors, subsectors and companies, the results will cover a broad scope of experiences and knowledge. The fact that the project tries to engage all the stakeholders in the process stimulated their involvement in, identification with, and interest in the policy innovation process.

The projects in the **Checklists on the art of writing and reading safety data sheets** (Sweden) could measure the effect and success of their project with the download statistics. They did not execute a full survey to evaluate the outcomes and opinions, but spontaneously received positive feedback on these checklists.

## 5.3. KEY POINTS

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The cases that are listed in this report have all followed the logic of these communication principles. In reality the division between these elements is not always as clear-cut in practice as in theory and in most cases different channels and supports are combined. Main points for consideration are listed in the following table:

### *Analyse the present situation and possibilities*

- Assess accurately the nature and scope of the problems

### **Creating the message**

- Look for former experiences and knowledge from other stakeholders that can be used as valuable input for the case study

### *Reflect upon the content of the message*

- Establish the objectives
- Start from complete and exhaustive information to create your message
- Whether the complete information has to be transmitted or not depends on the purpose of the message and the target audience
- Adapt and translate the content to the needs and understanding of the target group
- Flexible content can be useful in personalising the message to the needs of every single user
- Use a consistent approach if the project is set up in different areas in order to ensure that the outcomes are measurable and comparable from one sub-project to another

### **Conveying the message**

#### *The actors*

- Search for partners with expert experience in order to improve the quality and credibility of the programme
- The type of actor and its influence will have an effect on the outcomes of the project

#### *Select the channel and best available technical support*

- Select the most effective tools and channel:
  - possible channels: training sessions, seminars, demonstrations, workshops, etc.
  - possible tools: intranet, leaflets, safety posters, safety manuals, SDSs, brochures, CD-ROMs, databases, questionnaires, reports, etc.

- Consider the location, adapt the mediums and tools to the needs of the target audience and to the information you want to transfer
- Present the information in a well-balanced way in terms of length and complexity
- Make sure that the tools are easily accessible with clear and understandable information
- Interactive tools increase the commitment of the user

### **Reception of the message**

#### *Stimulate and involve the target public*

- Inform the workers regularly of changes, in order to increase identification with the programme
- Communicate openly about the goals and the collection of information and be open to interaction
- Present the costs and benefits to the target audience

### **Feedback**

#### *Collect and follow up feedback*

- Use audits, surveys or questionnaires to evaluate the information and keep it up to date
- Consult the workplace level about their suggestions, opinions, etc.
- A bottom-up approach is helpful to determine whether the information is focused, comprehensible and responds to the information needs of the target audience
- Stimulate the active participation of the workers in changes at workplace level

## 5.4. OVERVIEW OF THE CASES

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### 5.4.1. SUCCESSFUL APPROACHES AT COMPANY LEVEL

#### Globally integrated process safety management at Lilly Development Centre (Belgium)

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#### Key points

- Development of an integrated management system in the company aiming to reduce accidents and exposure to chemical risks
- Systematic and repeated training for every employee at every specific level and development of information tools for employees
- Permanent monitoring of results, progress and potential problems by the OSH department
- Horizontal communication allowing the OSH department to collect feedback from the workers

#### Introduction

Lilly Development Centre (DC) is a pharmaceutical research and development company storing and working with a variety of dangerous substances. The company employs about 400 people. The headquarters of this research and

development centre are based in the United States (Lilly US) and they have sites all over the world. Guaranteeing a safe and healthy working environment is an important and permanent concern of their business management.

The Belgian centre is situated in Mont-Saint-Guibert in Wallonia, the southern part of Belgium. The actions in the Belgium centre are tightly linked with the policies of Lilly US. There are large amounts of dangerous substances present in the company. These substances are stored in different parts of the plant. It deals with a variety of products in smaller quantities. In addition, there is a park with storage tanks of 10 000 litres each. In these tanks are stored organic solvents such as toluene, methanol, acetone or methylchloride, hydrochloric acid and wastewater.

With regard to prevention measures and policies, the company has to take into account Belgian and European law as well as the prevention policies of Lilly US and the rules of the chemical industry worldwide (e.g. responsible care).

In 2000, Lilly DC established their GIPSM (globally integrated process safety management) programme. The programme became the basis of the company's integrated safety management system.

### Background

The accident rates at Lilly US in the previous years demonstrated a need to establish goals and apply safety management systems to reduce the level of accidents. Audits in 1998 in Lilly DC also displayed some deficiencies in process safety. Various programmes were set up to improve safety within the company: chemical exposure assessment and containment control, process safety management (PSM) and contractor safety <sup>(1)</sup>.

The most important potential risks are fire and explosions. Other risks in the company are cuts, needle stick injuries, risks linked to laboratory activities, e.g. implosion and explosion of containers, eye injuries, burns or irritation of the skin, intoxication due to inhalation, etc.

### Aims of the action

The aim of the GIPSM programme was an ongoing development and implementation of process safety management in the manufacturing facilities in order to reduce accidents, exposure to chemical risks, and business interruptions, to prevent adverse publicity, to apply regulatory requirements and Lilly policy requirements, and to achieve 'Responsible Care' and 'Product Stewardship'.

### Scope of the action

Lilly Development Centre is part of the worldwide network of pharmaceutical companies, which means that the management and OSH safety systems in Belgium are framed in the larger safety management context of Lilly US.

The target group of the safety policy is the whole company. Every local centre has a certain amount of freedom to attain the goals and can decide to a certain extent how to execute the management of safety in practice.

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<sup>(1)</sup> This process safety management forms part of the OSHA regulations in the USA. The GIPSM programme — the basis for the safety management system in Lilly DC — is a translation of the US process safety management into the context of the company.

The GIPSM programme provides for systematic and repeated training for every employee at every specific level, in order to manage potential risks and prevent accidents. To get the safety message across, several information tools for employees are developed by the safety officers (e.g. safety posters) and available for use during information sessions.

#### *Transmission of the information step by step*

The transmission of the information begins with a brochure for every new worker.

#### *New workers*

A basic manual is provided to new workers. In this manual, the worker can find safety principles, company organisation and who to contact for health and safety issues, information sources available on the intranet and what to use them for, health and safety pictograms and their meanings, what to do in the event of an accident, evacuation routes, the environmental charter of the company, etc.

Not only are workers informed but visitors also get a colour leaflet with safety instructions.

#### *Training*

Depending on the target group, a variety of training sessions exists. The safety officers claimed to be well aware of the importance of these types of instructions. Fire training is developed in conjunction with the fire brigade. Every new worker is given personalised safety training. Safety training sessions are regularly repeated for each worker.

#### *The intranet*

The safety data sheets (SDSs) of the products used are available on the intranet. Other information sources on the hazards and risks which exist are CD-ROMs, forums, procedures, reports, meetings, audiovisual media, signs, labelling, colour codes, etc.

On the intranet, users find documents and information to assess the risks of dangerous tasks on the site.

Also provided is direct information to all staff members on health and safety measures and protection of the environment. Dynamic links allow the internal information to be connected to more general information on the intranet as well as on the Internet. According to the company, of all the developed tools in the company, the intranet is the most important and interesting because of the diversity of possibilities and the guarantee that every employee receives the latest information.

#### *Safety manuals*

A specific tool for laboratory workers is the safety manual available on the intranet. This manual contains a vast amount of information on the safety principles and procedures in the laboratory.

For example:

- general demands regarding everyone's responsibility and tasks;
- information on medical checks;
- training;
- specific procedures for contractors, visitors and temporary workers;

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*The use of the intranet enables the large amount of information to be presented in a hierarchically structured manner to all the members of staff of the company and at the same time makes it possible to easily update the information.*  
(Benoit Duqué, Team Leader, Safety–Security–Environment)

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- information on the hygiene and disinfection of the working place and instruments;
- the prohibition of eating, drinking and smoking in the laboratories and other working places;
- prescriptions regarding the storage and handling of certain products, ventilation, electrical installations;
- prevention and management of accidental dispersal;
- the definition and significance of risk symbols and codes;
- risk phrases and prevention measures;
- lists of carcinogenic products;
- a list of recommended gloves;
- lists of the solvents most used.

Other manuals adapted to other workstations and tasks are available to the workers concerned.

### *Dealing with legislation*

To cope with the different regulations and policies that apply, the company uses European/Belgian as well as American signposting and labelling. The US system, the NFPA diamond, contains a colour and figure code. Employees are instructed to have knowledge of all the supplementary systems.

The European/Belgian and US regulations have been brought together in a manual on the intranet. Because the legislative texts and SDSs are inadequate for daily use by employees, the regulations were analysed, compared and summarised in a safety instruction card. This instruction card combines the codes and colours of the US NFPA diamond, the European pictograms, the R and S sentences in application on the specific dangerous substances and additional information regarding the specific situation of the company. For labelling, the company also uses the US and European labelling method.

### *Colour codes*



In addition to the existing international colour codes used in the safety signalisation, the company has developed its own internal colour codes for dangerous waste treatment. The principle is explained in the employees' basic manual.

### *Safety posters*

In the workplace, clear and colourful posters are put up at strategic places to draw the workers' attention. The posters concern the safe use of dangerous products and good practice regarding storage and handling of substances and basic hygiene rules (keeping the space clean and tidy, never pipette dangerous substances using the mouth, do not identify products by smell, the tasks and responsibilities of people working in certain places, etc.).

### *Safety of contractors*

Contractors operating on the site are informed about procedures and safety measures. To guarantee that the right safety measures are taken, several parties must agree before work can start.

### *Information meetings and evaluations*

Before introducing a new process the employees are consulted. They can discuss opinions and make remarks. When introducing new personal protective equipment (PPE), volunteers are requested to try out several PPE models before they are purchased. The workplaces are inspected at least once a year.

Feedback from the workers is regularly collected and taken into consideration by the OSH department. This sometimes leads to changes and additions to the information and processes in the workplace.

### *Organisation of a Safety Day*

On this day, staff could discover and test out the prevention and protection systems and equipment existing on site as well as the devices which they should use in their private lives.

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*We have indeed observed that the best way to involve people in a safety process is to respond to their personal needs and to show them their personal benefit in following the safety measures before mentioning the benefits of the employer and the company in general.*  
*(Benoit Duqué, Team Leader, Safety–Security–Environment)*

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## **Problems encountered**

Due to the fact that the OSH service did not have enough staff to implement the system, the practical implementation of the system could only take place after expansion of the internal OSH service, which took place in 2002.

## **Results**

### *Reduction of accident rates*

Some time ago, a recipient containing a product that reacts with air was fractured. The appropriate and quick response of the employees during this incident proved the adequacy of the training programmes.

Before implementing the GIPSM programme in 1998, the company performed an audit to map out the problems, risks and difficulties that needed to be resolved. An interdepartmental group was created to assess, upgrade and improve the existing management systems. This group continues to follow up the results. Audits are periodically carried out to measure progress and potential problems.

The results of the GIPSM programme were reflected in the decreased accident rates of 2002. The reason for the late change is the fact that the practical implementation could only be executed after the expansion of the internal OSH service in 2002.

	Frequency rate	Gravity rate	Global Gravity rate
2002	1.34	0.004	0.004
2001	4.79	0.10	0.37
2000	5.73	0.02	0.02
1999	6.2	0.19	0.19

Compared to recent years, accidents became less frequent and in 2002 there was an apparent decrease in the seriousness of injuries.

### General evaluation

Knowledge of the safety measures is one of the conditions for working in the company. Every step of the corporate process is assessed and monitored. The audits and modifications are also applied to address new potentially hazardous situations. Tools and training sessions are adapted to the specific situation and knowledge of the worker concerned.

The fact that workers are taught that following the rules is not only in the best interests of the company but also in their interest and the interest of their co-workers clearly stimulates workers to follow the rules.

Since the OSH department is integrated into the site and the members regularly participate in activities of the departments, it receives regular feedback and comments regarding the way of communicating or the activities. As a result, the OSH department has for instance simplified the communication strategy regarding certain safety issues, provided additional information and made the information more accessible to the workers. In some cases, this has also led to a treatment of safety issues beyond mere safety and health at work.

The development centre has opted for these tools because of the wide variety of possibilities they offer. Via intranet not only is it possible to reach all members of staff, but a distinction can also be made between the complexity of the information needed for every section or department of the company. This way of providing information is quick, reliable and gives access to updated information. The OSH department chose to complement the information with fairly concise brochures and safety posters that are easily accessible to workers. These explain in simple language the most important safety principles and reasons for on-site safety awareness. The brochures are handed to every person that comes onto the site, not only to staff but also to visitors.

### Success criteria

- Obligation but presented with arguments

Every person entering the site is obliged to participate in the health and safety philosophy. Visitors are immediately informed about safety measures, the most important safety pictograms, what to do in the event of an accident, etc. However, the obligation is not imposed without explanation. The OSH department realises that people collaborate more easily if they know the reason why they have to follow these rules.

The OSH department stresses what the personal gain for the workers is if they follow the safety rules.

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*The effects of the management security system developed at Lilly Development Centre only began to pay off in 2002, when the strengthening of the internal OSH service made it possible to go from a theoretical system to practical implementation at the workplace.*  
 (Benoit Duqué, Team Leader, Safety–Security–Environment)

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- Comprehensible tools adapted to the needs of every worker

Thanks to the posters, manuals, training sessions and other measures, employees are well aware of the risks and hazards present in the company and of their responsibility. The tools used to inform and communicate are clear and understandable. They are designed according to the specific level of knowledge of the employee. Some groups in the company need more technical information than others.

- Evaluation of training programmes and of knowledge

Knowledge of safety measures and principles is checked after training.

- Combination of US and European systems

The communication process between the health and safety department and employees is eased thanks to the combination of the European/Belgian and US systems for the safety instruction cards and the labels on the recipients. This is an important feature in a company with international staff.

- Horizontal communication

The OSH service is integrated into the site. This eases its participation in the activities and meetings of other departments. The service does not stand outside the company processes. This is why it gets a great deal of feedback from workers. The internal OSH service takes all feedback from workers into consideration and decides whether the comments or suggestions can be integrated into the safety management system.

## Transferability

The experiences of Lilly DC can be used by other companies trying to set up an integrated health and safety management system. To determine which elements are necessary to monitor the corporate processes and how they interact, the elements of the GIPSM programme are useful. Although the whole safety system is perhaps not applicable to very small companies, the methods of translating the complex and sometimes technical information to concrete, simplified, and clear instruments for daily use in the workplace are certainly useful to other companies of different kinds and sizes.

## Contact information

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*Neither the management system, nor the communication system alone, can improve the level of safety. They are, however, important elements, in the same way that support from the management, integration of the safety in all the activities of the site, training, etc. are important.*  
(Benoit Duqué, Team Leader, Safety–Security–Environment)

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## Informing workers about the hazards of chemical products — Polimeri Europa (Italy)

### Key points

- Intranet databank consisting of safety data sheets (SDSs) and a hazardous substances database also for intermediates
- User-friendly, understandable, and easy access to information for all employees in all the plants of the company

### Introduction

Polimeri Europa is a leading company producing mainly polyethylene products for the Italian and European markets. Following its merger with EniChem, Polimeri Europa is now responsible for the production of olefins and aromatics, styrenics, and elastomers. This cooperation has meant the restructuring of the company and the improvement of technical and human resources. The new range of technologies in 11 plants in Italy, eight in Europe, and one in the USA, as well as a wide distribution network, demand a coordinated information system for purchasing, storing, cataloguing and marketing raw materials and products. Since a large number of employees are involved at all stages, it was essential to develop a unified system for handling materials from the time they enter the plant to the time they leave. The handling of chemical materials is associated with health hazards and safety considerations. A method by which these problems can be dealt with is the collection of SDSs, a process prescribed by European legislation.

### Background

Polimeri Europa collects the SDSs for raw materials, intermediates and products with the ultimate aim of improving safety in their transport, handling and storage. Nevertheless, an effective use of these documents requires the development of an information management system common to all storage, production and distribution levels. It is obvious that such a system should be flexible and easily accessible to all employees.

### Aims and goals to be reached

The basic principle in the training of workers on health and safety matters is to provide them with information about chemical products in the workplace and the related hazards. This information should be understandable to them and the specified measures should be easily applicable. This goal can be achieved by designing and implementing an information system that can be easily accessed from the company's intranet at all production sites in Italy or abroad. In parallel to this, a training programme should be introduced in order to impart aspects of health and safety in the workplace and the necessity and importance of using the intranet to solve not only queries but also practical problems.

## Scope of the action

This action was designed to be implemented within the company either in Italy or abroad. It is accessible to all employees within the company whether they are involved in production, packaging, storage, transport, cleaning, office work, occupational safety and health, administration, etc. provided they have access to a computer.

The system developed contains two sets of data:

- an SDS database for all substances and preparations;
- a database of hazardous substances as defined by legislation in European directives and implemented in Italy with the Decree of 14 June 2002.

According to the published internal guidelines, SDSs relate not only to hazardous and non-hazardous products put on the market but also to their intermediates. Management of the database is centrally coordinated and information continuously updated according to changes in legislation. The head of each production section completes a specific form, in different languages, providing new information about the products and their properties. Central management, in collaboration with the sections, has developed a plan for periodically revising all safety instructions and guidelines including the SDSs.

This user-friendly SDS database system enables the employee to group substances or preparations according to one or more common characteristics or to their origin. The first page that appears on the screen contains the following information:

- The manufacturer
- Product name (chemical or trade; when both are available, the chemical name is preferred)
- Date when the file was revised
- CAS number
- Whether the product is a substance (S) or a preparation (P)
- The language used (Italian (I) or English (E))
- Whether the product is dangerous (D)

By using keywords in conjunction with logical operators (AND, OR, NOT) the user can obtain the information required.

The layout of the data sheet was designed as a PDF archive. A special archive contains the older versions of the data sheet.

Each SDS has attached to it the four following sections:

### 1. General information section (containing the following)

- Date of issue
- Date revised
- Type of product (substance or preparation)
- Language (Italian, English or other)
- Origin of product ('Polimeri Europa' or other)
- Name of product (may not be available in case of preparations)
- Commercial name (may not be available in case of substances)
- Synonyms (if available)

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*The SDS databank is useful in that it collates the available information for hazardous substances contained in many European directives. It is possible to have quick access to reliable information not only for our products but also for materials purchased. Intranet gives access to all Polimeri Europa employees wherever they work. The system could be further improved for easier use among non-Italian speaking employees.  
(S. Minardi, Standardisation & Certification, Division for Elastomers and Styrenes, Polimeri Europa)*

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- CAS number
- UN number (if available)
- SDSEdit number (if available from programme SDSEdit)
- Previous editions ('yes', if available)
- Notes (comments, if available)
- Risk phrases in Italian (if applicable)
- Risk phrases in English (if applicable)
- Hazard grade (if available)

### 2. Information on the enterprise and its production divisions

If the material was purchased from another company, the name of the company appears in the field 'Supplier'. If it was produced by Polimeri Europa the name of the division and the company appears in the respective fields.

### 3. Information on the location of materials

Location of materials within the plant and its divisions.

### 4. Information control system

Allows verification of the archives management system.

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*This databank is essential for the company's occupational physician to retrieve information about the classification of products, health effects, and hygiene measures in order to achieve a valid risk assessment.*

*(M. Broi, Polimeri Europa's Occupational Physician)*

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The database of hazardous substances makes use of definitions contained in European Directive 67/548/EEC. To retrieve information for a substance or preparation, the user only has to type one or more of the following, with or without the use of the logical operators: product name, CAS number, index name, EC number, risk phrase, safety phrase, label, or last revision.

The database could be of minor value if, in conjunction with this, there were no other requirements. This was achieved by organising training courses and seminars, and issuing a manual and additional information material, making the features of the programme easier to understand.

### Problems encountered

The problems in the functioning of this programme are minimal. Nevertheless, through continual use it has come to the fore that there is no easy way for the user to be aware of additions or modifications that may have been made to the existing data system. This could be overcome by introducing onto the front page of the programme an announcement index specifying new editions and where modifications have occurred.

Although the system is user-friendly, many employees are not fully acquainted with the database. Further to this, they have not fully realised the potential of the system. This could be overcome by increasing the number of seminars for current employees and introducing new training courses, initiating newcomers on matters of health and safety through the computer.

### Results and evaluation

Currently, SDSs can be provided for about 2 000 chemicals and preparations. Accessibility to these is now guaranteed to all Polimeri Europa computer users within all plants all over the world. It has been ascertained that during the implementation of the system awareness was cultivated resulting in a changing attitude towards health and safety risks associated with chemicals. This has been confirmed by feedback from production line workers and technical staff.

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*The system is very useful for a fast retrieval of information not only from SDSs but also for tracing a product's history. This more comprehensive system has made the conventional archival methods redundant. It is obvious that improvements should be constantly sought.*

*(L. Berni, Safety and Environment Department, Polimeri Europa)*

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Although it is difficult to quantify the impact of this initiative, the responses given by the employees have indicated that an increasing number of them use the intranet databank on a daily basis. In addition to this, the system has provided useful information to safety engineers to suggest new and/or better work practices, for example improved ventilation systems.

### **Transferability**

Polimeri Europa is an international company whose diverse activities are carried out in a large number of countries with different social attitudes towards work. Despite this, the company has attempted to transfer its perception on matters of health and safety throughout its plants creating a common work ethic. This can be accomplished through the company's intranet databank and supplemented by seminars based on common perceptions of the goals to be achieved.

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## Low-cost interventions — Substituting and eliminating hazardous chemicals and procedures (Greece)

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### Key points

- Low-cost interventions to achieve a healthier work environment
- Substitution of substances for less dangerous ones
- Elimination of hazardous activities by reorganising production
- Information exchange between safety experts and employees concerning the layout and functioning of the new processes

### Introduction

Siemens Tele Industry SA was founded in 1964 as a joint venture between Siemens AG (70 %) and the National Bank of Greece (30 %). As an industrial unit, it manufactures products in the field of telecommunications and electronics, not only for local but also for global markets. The company employs 300 workers at its production plant in Thessaloniki, northern Greece. The basis for the proper operation of the plant (other than Greek and European legislation) is the implementation of internal technical guidelines. As far back as the mid-1990s the company made a concerted effort to improve working conditions by eliminating possible hazardous substances used in the manufacturing processes. These ideas and efforts culminated in the instigation of a programme to substitute chemicals or processes with less dangerous ones.

### Background

In the production sector, cleaning of the electronic boards has always been a matter of concern. Prior to the formation of an electronic circuit, the boards were sprayed with colophony in order to facilitate welding. The whole process took place in metallic trays on a moving belt. The trays and the boards were then mechanically lifted and dipped for a fixed period of time into ethanol and methanol in order to remove excess quantities of colophony. The ethanol–methanol solution was contained in open vessels in an area with a local exhaust ventilation system. The work area was also equipped with devices and

an electrical system that would minimise the risk of explosion. Despite the precautionary measures taken, the problem of alcohol vapours still existed and became particularly intense over the summer months. During the entire cleansing process, two to three people are required to be present for every eight-hour shift (approximately 100 workers per shift).

Another area within the production site that had the potential to cause health problems was the manufacture of scaffolds for the electronic digital switching systems from galvanised metals. Galvanisation is an electrochemical process involving the use of acids and solutions of metal salts. The galvanised materials were baked in ovens. The electrochemical cells were required to be under exhaust hood systems with filters. In addition, workers wore protective masks. The waste solutions were chemically processed and appropriately disposed of. Galvanisation process involves two to three people per eight-hour shift.

### Aims and goals to be reached

The objective was to substitute the alcohols for a less dangerous substance and to eliminate the galvanisation process. Ethanol and methanol are both relatively volatile compounds. Exposure to methanol vapours is known to cause headache, drowsiness and eye irritation. Inhalation of ethanol vapours can result in irritation to the eyes and the mucous membrane. Exposure to ethanol may also result in stupor, fatigue and sleepiness. Contact with acids can destroy tissues causing skin burns. Inhalation of acid vapours could be corrosive for the upper-respiratory tract.

### Scope of the action

The scope of the changes was limited to the plant and particularly to those involved in the activities described above.

The production process was redesigned: in the board production site the vessels were cleaned to remove residue alcohols and then filled with water at different temperatures to determine the temperature which would yield the same cleansing efficiency as the alcohols. It was found that a 50–58 °C water bath was successful in removing residues of colophony. It was necessary to change the water in the vessel on a weekly basis in order to avoid the build-up of salts of which the residues could interfere with the conductivity performance of the boards. The need to electroplate metal parts of the final product was overcome by purchasing stainless steel sheets and hence not necessitating the use of solvents, acids and alkalis.

In addition to these changes in the production process, new technical guides were issued and the workers and technicians attended instruction sessions for familiarisation with the new working environment.

These interventions demanded a new risk assessment process and its respective safety policy. At this point, the Health and Safety Workers' Committee together with the safety engineer and other technicians played a decisive role in redesigning the working environment.

The main sources of information for these changes came from the SDSs, the company's former technical guidelines, and national and international legislation.

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*Siemens Tele Industry SA has introduced technological know-how from its parent company particularly on matters concerning health and safety and environmental protection. The achievements in this area were not something that occurred overnight but as a result of continuous efforts aided by the active participation of the workers' union.  
(Emmanuel Manolis, Safety Engineer)*

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These interventions were supplemented by training courses, the distribution of new working guidelines, and the placement of instructional boards exhibiting measures of protection and good practices.

### Problems encountered

No major problems were encountered that would disrupt the production process and the quality of the products. With the elimination of the galvanisation process and the purchase of the stainless steel scaffolds, initial production costs were slightly increased. However this was offset by the now lower costs due to elimination of the electrochemical process and the reduction of the waste to be treated and disposed.

### Results and evaluation

In order to ascertain that the goal had been achieved, gas detector tubes were used, this time after the interventions. It was found that the levels of alcohol vapours and acid fumes were below the detectable limits.

According to the results of a questionnaire answered by the employees, it was shown that there was a reduction in headaches, nausea and dizziness throughout the working period, especially during the summer months. The elimination of solvents limited the need for special fire protection measures. In addition, the electrical installations do not have to comply with explosive prevention requirements thus rendering service and maintenance easier. The workers were also exempt from following specific safety protocols and from using personal protective equipment such as masks, gloves, goggles, etc. thus making their work easier to perform. Consequently, safety signs were changed to meet the new circumstances. The absence of volatile solvents eliminated the use of the local exhaust systems, thereby reducing noise. Production time decreased thus increasing productivity. Despite these minor low-cost interventions to the production process, the quality of the products has remained up to standard.

### Identified success criteria

These interventions showed how a good understanding and cooperation between employees and employers can lead to results that can be to the benefit of both. As already indicated, the company's Health and Safety Committee not only stipulated the changes that needed to be made, but also cooperated with production and safety engineers in the development of new techniques and their implementation. As far as the employees were concerned these interventions led to a less irritating and more pleasant environment. The employers were satisfied, despite the initial cost involved during the changeover period, because they achieved an increase in productivity and products of equal or better quality. A less complicated working environment renders all processes easier to carry out and control and requires less supervision.

### Transferability

The final cost to make these changes was relatively small and led to profound results. These small types of intervention can be considered by other companies to initiate similar programmes either for the elimination of processes with inherent risks or for the substitution of substances with less dangerous ones.

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*Through its total quality management system (TQM), Siemens Tele Industry SA has developed its policy for environmental protection and health and safety. Small low-cost interventions have proved to be an effective means for achieving business excellence. (Anastasios Staphyllidis, Quality Manager)*

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*Day-to-day observations and interventions on various work procedures, no matter how small or insignificant they might appear to be, can ultimately culminate in the promotion of good working practices and a healthier environment. (Babis Kalaitzidis, Head of the Employees' Union and Member of Hygiene and Safety Committee)*

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## Glanbia Ingredients — Involving workers on substitution of a gas system (Ireland)

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### Key points

- Chlorine gas used as a disinfectant for the company's treated water supply represented a considerable danger for the workers
- Input and suggestions from the workers led to the removal of the gas system and its substitution by liquid sodium hypochlorite, which uses a simple dosing system and poses minimal risks to the operator

### Introduction

Glanbia Ingredients provides ingredients for food manufacturers and for a wide variety of nutritional products. At their factory in Virginia (Ireland) chlorine gas was used as a disinfectant for the treated water supply of the company.

### Background

There was a high level of danger associated with the changing of the chlorine cylinders and the operation of the chlorine gas unit. The system needed replacing due to its deterioration and more importantly the increasing safety risk it posed.

### Aims and goals to be reached

The aims and objectives of the project were to introduce a safer method of water disinfection. The company aims to eliminate accidents and injury to all personnel by continually improving work systems and procedures.

### Scope of the action

The stakeholders for this project were the operators and company management. It was the management's responsibility to remove this hazard and to provide the operators with a safer working environment.

Employees and operators are actively encouraged to suggest improvements in their workplace and a number of ideas were proposed for the replacement of the chlorine gas dosing system. During an informal talk, an operator suggested removing the gas system and replacing it with liquid sodium hypochlorite using a simple dosing system. This idea was discussed during one of the weekly meetings and followed through. The chlorine gas system was removed completely. The only task the operator is now required to carry out is to replace the bulk IBC tank of sodium hypochlorite every two months.

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*On a small site with a flat management structure, operators and employees talk openly to their managers. (Alan Magovern, Services Manager)*

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The risks are minimal in comparison to the daily requirements of operating the chlorine gas system and changing cylinders. In order to make these risks known, the company disposes of several tools: notice boards, training intranet, leaflets and SDSs available to all employees around the site. In addition, there is a safety statement that contains a written account of all risks and hazards on the site.

### Problems encountered

The new project was so simple that there were no problems. Proper project planning ensured no obstacles during the project implementation.

### Results

The benefits to the operators and the company are significant. Firstly, and most importantly, the idea for the new system was suggested by an operator and was not a management decision. Secondly, it has completely removed a potential health and safety hazard. Finally, the cost was minimal in comparison to the replacement and installation of a new chlorine gas system as all the requirements for the new system were available on site.

### General evaluation

A simple solution to what seemed an expensive problem proved to be removing a potential health and safety hazard.

### Identified success criteria

- (1) Involvement of the workers. The workers were involved throughout the project so they were completely aware of what was happening.
- (2) Bottom-up approach. The idea for the new system was suggested by an operator and was not a management decision.

### Transferability

This project, due to its simplicity, is fully transferable to any other operation/site/company where chlorine gas is used.

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*The workers were involved throughout the project so they were completely aware of what was happening.  
(Alan Magovern, Services Manager)*

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*The operators were delighted that the hazard was removed and a new system proposed by one of the fellow employees installed.  
(Alan Magovern, Services Manager)*

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## 5.4.2. SUCCESSFUL APPROACHES ON THE SUBSTANCE SUPPLIERS LEVEL

### Würth Oy audits on chemical safety for its enterprise customers (Finland)

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#### Key points

- Chemical safety audits from the chemical supplier to its customer enterprises
- Documented checks on the quality of the relevant equipment, management system, and SDSs, as well as on the chemical safety knowledge at the workplace
- A tool to promote safer products among the enterprise customers

#### Introduction

Würth Oy is a partner of the international Würth Group and the leading wholesaler of the technical sector in Finland. The Finnish company has 750 employees and 60 branch offices around Finland. Its product range comprises 28 000 articles: hand, pneumatic and electric tools, parts for fastening, chemical products, grinding equipment, etc. Chemical products include maintenance chemicals such as cleaning, coating and sealing agents, paints, and adhesives.

Würth Oy has a great variety of customers ranging from small car repair companies to depots of the Finnish Army and Helsinki Energy. Since 1999, Würth Oy has provided audits regarding key chemical safety to more than 600 of its customer enterprises. The aim of the chemical audit is to create an environmentally safe and sound chemical storage and management system for the customer enterprise. With this voluntary action, the company has promoted its environment-friendly product series and improved its customer relations.

#### Background

Würth Oy was established in 1975 and has since developed a network of branches that covers the whole of Finland. It has about 25 000 customers from enterprises of different sizes.

In 2001, Würth Oy launched an audit project to promote the sale of its environmentally friendly product series. The Pineline series comprises car and industrial maintenance chemicals and has been granted the Swan eco-label introduced by the Nordic Council of Ministries. According to the criteria of the Nordic labelling board, these products are generally not dangerous substances according to the Commission directive on classification, packaging and labelling of dangerous substances but there are a few exceptions with regard to some specific classifications on flammable and irritating substances in consumer products and burning and harmful substances in products for professional use only. Refillomat series comprises a large variety of products that can be purchased in refillable packages.

### Aims of the action

Würth Oy invests in the development of environment-friendly and safe products. These audits were initiated to introduce these products better to the customers and in order to better help the customer enterprises when purchasing these chemicals.

### Scope of the action

The audits are made without additional charge and all the information received from the customers in the audit process is treated as confidential. The salesmen mention the opportunity to have this kind of audit during their common meetings with the customers. No additional advertising has yet been made regarding this possibility.

The company has 14 trained auditors, who typically also have relevant experience of working in the sector of the customer enterprises. The auditor undertakes the audit in cooperation with the workers, management and OSH/environment staff of the enterprise. The audit can be done in 60 days and does not cost the customer extra. The audit report can be incorporated in the enterprise's quality system.

The audit proceeds as follows:

(1) The Würth Oy auditor meets with the cooperating representatives of the enterprise including the personnel responsible for environmental protection, OSH, procurement and the storage of chemicals. During the first meeting, the auditor presents the stages and objectives of the forthcoming process and fixes the time schedule. In addition, the representatives of the enterprise take a test on their current knowledge and know-how regarding chemical safety matters. This test is archived by the customer for self-evaluation to be carried out after the audit has been completed.

(2) The auditor surveys the workplace in cooperation with a representative of the enterprise for the following issues:

- chemicals used in every place of work (the listing also includes dates of purchase for old chemical products, and labels of the dangerous substances);
- the quality of SDSs (checked randomly);
- workers' level of knowledge on chemical safety is tested by a quiz, which also promotes interest in the products and chemical safety;
- working procedures regarding the use and storage of chemicals are studied;
- available personal protective equipment (PPE) and first aid equipment.

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*The audits are made without additional charge and all the information received from the customers in the audit process is treated as confidential*

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*Enterprises do not always know that they should regularly check not only the PPE but also the working procedures at each working point and update their knowledge on the applied products on a continuous basis. (Jouko Repo, Würth Oy)*

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A written report on the survey is made and archived for the customer to allow further analysis of the system.

(3) The auditor plans a chemical management system according to the reported situation within the enterprise. The system also contains recommendations on substituting the products, detailed in the company's product database to ensure safe and feasible solutions.

(4) The audit report is delivered with a plan on how to accomplish the updating of the chemical survey comprising the dates for cleaning and organising chemical storage, and names of the personnel responsible. Expendable chemicals are marked with an 'expendable' label to ensure that they really are removed from use.

(5) Afterwards, the SDSs are organised into an information cabinet to be located near the chemical storage area. The chemical storage is cleared of the outdated chemicals and workplaces are checked to ensure that all of the outdated products really are disposed of as hazardous waste. The self-evaluation form is filled in again to check development trend in chemical safety and to remind the workers and management of key issues.

(6) The workers are trained to use the SDSs relevant to their work and to use adequate PPE. In the training session, information is also shared on the dangers that the applied chemicals pose to the environment.

(7) The implemented chemical system includes a maintenance check and a new survey on the state of the chemical storage area, the appropriateness of the applied products, the quality of the SDSs (including all of the applied products, not only Würth Oy's), PPE and first aid equipment storage and suitability, and the workers' level of chemical safety knowledge. The *post* audit is also undertaken by the Würth Oy auditor together with the representatives of the customer enterprise. Again the audit includes checks on the practical measures for ensuring chemical safety, e.g. the quality of the chemical storage cupboards, potential substitutes for certain hazardous products, and guidelines for selecting appropriate and better PPE.

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*There is a vast need for this kind of service for SMEs in Finland. The managers of these shops with less than 20 workers manage occupational safety and health occasionally and are often not entirely aware even about the minimal requirements of the legislation on chemical safety.*  
(Jouko Repo, Würth Oy)

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### Problems encountered

The audits have been considered successful so far and only a few customer enterprises have declined to have their chemical safety systems audited. These few cases have typically enjoyed poor relations with the salesman offering this free service. In addition, the purpose of the audit project itself has sometimes been unclear to customers, many only expecting to receive guidelines on the use of PPE. These problems have been solved by providing further information.

Unexpectedly, very small enterprises with scarce resources to do the chemical safety checks themselves have not appreciated the service. As customer enterprises are often very reluctant to let their rivals know about their businesses, word of this service and its benefits has not yet spread widely.

### Results

Würth Oy has completed audits for about 600 customer enterprises and is working on over 100 new audits. Several companies, audited for the first time about two years ago, will soon be *post* audited.

As a result of these audits, Würth Oy has managed to promote the sales of its products as a whole and specifically the sales of its environment-friendly product series. After the audit, a customer enterprise has typically purchased fewer chemicals than before the audit and centred the purchases on Würth Oy suppliers only. This is probably due to improved knowledge of the contents of the chemical storage area, the use of the chemicals and the chemicals themselves.

Additionally, Würth Oy considers that the audits have deepened its relationship with its customers, in the form of better and easier communication between the chemical supplier and its customers. The company now knows its customers well. The customers now know not only what they really need to know better with regard to chemicals and what they need to have in their storage areas but also acquire a specialist contact. The *post* audits will show how customers audited two years ago have adopted the chemical management system.

### General evaluation

Generally, the audit project has received very positive feedback from the customer companies, who have often felt that this kind of support is badly needed but all too seldom available from the authorities and other related bodies. As a chemical wholesaler, the company knows the needs, the attitudes and the limited resources and knowledge of its customers regarding occupational safety and health, and environmental protection. As a supplier, it also has knowledge of the latest regulations and their implications for its customers.

The audits have not yet been widely requested, as they have not been widely advertised to the potential customers. Direct contacts with the customers via the salesmen have been very successful so far, however, and the auditors are now employed to capacity with the requests. Information on this sort of service does not spread easily from one enterprise to another and apparently, even with direct contact, the smallest enterprises are the most difficult to meet. The audit process, however, would take a substantial amount of working hours to complete.

For a commercial enterprise, the rewards from this audit project are the improved relationship with the customers and better sale of its products.

### Identified success criteria

The audit project has been successful because it manages to speak to the enterprises in their language. The enterprises are also likely to see this development of sensible chemical safety management systems as less of a burden than the check-ups by the representatives of the chemical safety authorities, such as labour inspectors, as they may feel more comfortable communicating instead with representatives of another enterprise. One of the major reasons for the popularity of the action is of course the fact that it is free for customers. The trained and experienced auditors are also a major key to its success. Owing to their experience, customers may find it easier to believe what they say. The large product assortment of Würth is also very suitable for this kind of holistic planning for companies in the technical field.

The audit process itself is clearly formulated to cover several relevant areas of chemical safety in enterprises. The clearly formulated process encourages the customers to adopt the project, which is also flexible and will comply with their

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*Würth has received lots of positive feedback from the audited customers and maintains constant communication with them. The audit process has been amended according to the feedback from these customers, who have thanked the auditors for this tool giving clearly planned and well organised help.*  
(Jouko Repo, Würth Oy)

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needs. As a result of the audit, all of the audited companies also receive a report that can be inserted in their management documents.

### **Transferability**

Basically, any chemical supplier can provide this sort of assistance to its customer enterprises. Audits of this extent, however, require large resources for practical work.

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## Prevention and control logistics related to accidents caused by chemical substances and preparations (Italy)

### Key points

- Assistance in the event of accidents during road and rail transport of chemical substances and preparations
- International programme coordinated at national level
- Three levels of operation

### Introduction

The transport of chemical substances and preparations is an activity with inherent risks. In the event of an accident, this could lead to a high number of casualties and major damage to the wider environment. The introduction of an integral system that could cover a wide geographic region would substantially reduce the time between notification of the accident and the intervention. Equally important is that the system is able to define the type of intervention according to the type and severity of the accident.

### Background

The European Chemical Industry Council (CEFIC) based in Brussels represents small, medium-sized and large chemical companies, which together account for 30 % of world chemical production. It is made up of the national chemical industry federations of 25 countries in Europe. Federchimica (Chemical Industry Federation) is the Italian participating body. CEFIC has developed the international chemical environment programme (ICE), an integral part of which is the transport emergency service (TES) programme. Participation in the TES programme is voluntary and is almost exclusively supported by companies who are members of Federchimica. These companies and associations should cooperate with the public authorities and the fire brigade.

### Aims of the action

The aim of the TES programme (SET in Italian) is to provide assistance in the event of accidents during road and rail transportation of chemical substances and preparations. Federchimica adopted the strategy of designing, distributing and improving accident prevention systems and, when the need arises, supporting the plan of action established by the public authorities through fast and effective measures taken by the TES programme.

### Scope of the action

Until 1 September 2002, the programme enjoyed the participation of 37 companies. The activities of the TES programme are regulated by an agreement with the Department of Civil Protection of the Prime Minister's Office and the

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*The TES programme is an example of successful cooperation between public and private sectors to improve safety in Italy. It is hoped that similar programmes will be initiated in the near future.*  
(R. Pavanello, National Secretary of the Labour and Environment Association)

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general management, civil protection and fire-fighting services of the Ministry of the Interior.

The operating structure for handling road accidents consists of the National Response Centre and 34 companies ('company points of contact'). In rail accidents involving chemical substances and preparations, the TES programme acts via an agreement made with Trenitalia-Divisione Cargo SpA of FS SpA, Rome, and with one member company of Federchimica operating in the rail service logistics sector.

TES is activated exclusively by dialling a number reserved for the Prefects' offices and the headquarters of the fire brigades. A 'call code' is assigned automatically to the public authorities. The National Response Centre, situated at the Enichem SpA factory of Porto Marghera, Venice, selects and activates the company point of contact of the TES member or the participating company capable of providing the public authorities with the level of operation they require. It is structured as follows:

Level 1: Data and information on chemical substances and preparations

Level 2: Assistance from a 'qualified technician' on the site of the accident

Level 3: Assistance from an 'intervention team' on the site of the accident

When transporting chemicals by train, the operations room at Trenitalia-Divisione Cargo SpA coordinates the activities of another 13 operation rooms distributed across the country. The National Response Centre initiates the operation mechanism by transferring data and information to the public authorities and the operations room of Milan that activates Level 1. In the event of Level 2 and 3 operations, the operations room at Trenitalia again coordinates the other 13 operation rooms and sends rescue workers, experts and special accident teams.

The public authorities are ensured the continual assistance of the company point of contact activated by telephone, fax or the Internet. Giving further support to the plan of action drawn up by the public authorities, Federchimica provides a transport safety database, which is automatically updated with the information and data on accidents received from the National Response Centre and other international links.

The success of these operations is determined by commitment to prevent as far as possible a loss of persons and damage to facilities and the environment. This was achieved through connections and procedures that have been tried and tested over the four years since the system came into operation. The means involved were:

- the *TES management manual* which was made available to the operators involved in the project. This enabled the operators to correctly apply the different phases of the procedure following the sequence: activation ? assistance ? results ? control;
- the Federchimica transport accident database, which could be accessed at [www.federchimica.it](http://www.federchimica.it). This site contains information about TES operations and accidents recorded by national and international organisations;
- the Italian Toxicology Information Centre (CNIT) established by Federchimica and Maugeri Foundation of Pavia became a company point of contact for the member companies of the TES programme. This centre was capable of answering calls 24 hours a day, seven days a week. The CNIT works actively

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*Exploiting the knowledge and experience of two sections of the community, industry and public administration, the TES programme has brought their respective organisational skills into contact. This has resulted in a greater number of participant industrial companies, thus improving the worthiness and image of the Italian chemical industry in the wider public. (R. Mari, Technical and Scientific Department, Federchimica and G. Gonzales, Safety Department ANSI, Polimeri Europa)*

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in the field of health rescue control in industrial accidents and performs Level 1 operations within the system.

### Problems encountered

Due to inherent differences in the structure and organisation between the public and the private sector, the initial stages of the programme were difficult to coordinate. Nevertheless, the insistence of the parties involved (public authorities, National Response Centre, companies, etc.) to realise the project and their strong commitment to extend and integrate the transport emergency service has been the driving force for cooperation.

### Results and evaluation

The speed of access to an accident site is determined by geography, roads, rail systems and other infrastructures. Participation in this programme has enabled safety engineers to better design the transport processes of chemicals. However, the main achievement of the programme was that it brought about contact for the first time between professionals in the industry, the public services and the fire brigades. The personal relations that were established is invaluable in the event of accidents that demand a quick and effective response. This confirms that the TES programme has been able to combine the positive aspects of both formal and informal communication processes and avoid negative phenomena often associated with bureaucratic procedures.

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*The TES programme has not only proved useful in the event of accidents in industry but has also acted as an information source for promoting a better public safety policy.  
(M. Miani, BASF Italia)*

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### Identified success criteria

A measure of success of the programme is the steadily increasing number of companies who seek to participate in the TES programme. TES can now provide public authorities with assistance on a 24-hour basis and reach the further accident sites from its 31 centres covering almost the entire country within five hours.

### Transferability

The TES programme is managed by CEFIC and encompasses most of the western and central European countries. There are 16 national response centres plus a centre in Malta. This international network could possibly be extended to other European countries or to companies not yet taking part. On a national level, it is very important to increase the number and diversity of the companies participating in the programme and to improve the communication and transport infrastructures in order not only to provide information but also to have quick access.

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## Checklists on the art of writing and reading safety data sheets (Sweden)

### Key points

- Guidance on how to draft and read a safety data sheet in everyday language
- Cooperation of the chemical manufacturers and suppliers, their associations and relevant authorities
- Promotion of public discussion on the topic

### Introduction

The Association of Swedish Chemical Industries and the Swedish Plastics and Swedish Chemicals Federation produced checklists on reading and writing good quality safety data sheets (SDSs). These checklists have been drafted in cooperation with the members of these associations to ensure that the guidance deals with the real and not the presumed problems and that the provided lists are comprehensible and useful to their target group.

The Association of Swedish Chemical Industries and the Swedish Plastics and Swedish Chemicals Federation merged to form the Swedish Plastics and Chemicals Federation (<http://www.plastkemiforetagen.se>) in January 2003. The Federation is a trade organisation of manufacturers and suppliers of the chemical and plastics industry in Sweden. It has about 330 member companies. The Federation aims to achieve a positive development for the manufacturers and suppliers of chemicals and plastic products in Sweden. It represents its members in contacts with the authorities, ministries and politicians, and the public and also provides them with information.

### Background

In 1997, a leakage of acryl amide from a tunnel construction site in southern Sweden into the surrounding environment received wide public attention. The acryl amide was an ingredient in a sealing agent in use at the site and in the aftermath of the incident it appeared that the SDSs provided by the chemical supplier for this product were not totally accurate. There were also reports stating that the workers had not been informed of the safety measures required according to the information provided in the SDSs. The chemical supplier, however, met the minimal requirement of the regulation obliging them to provide SDSs with dangerous substances and preparations. However, the SDS was of questionable quality and the lack of procedures for forwarding the information in the SDS to the workers meant that a lot of media attention was given to chemical safety measures in general and safety data sheets in particular.

This started a debate on SDSs and the construction industry began to scrutinise the quality of all the SDSs provided by suppliers of chemical products. A substantial part of the SDSs were considered to be of unacceptable quality and this observation was confirmed by surveys made by the KEMI, the national chemical inspectorate. Consequently, the Federation started a dialogue on the improvement of the quality of these SDSs.

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*We decided to share this information with everyone and publish it without charge to promote debate, not just within our member companies but also among the audience to create demand for good quality safety data sheets and better publicity for the Federation.  
(Greger Lundqvist, Swedish Plastics and Chemicals Federation)*

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## Aims of the action

The Federation aimed to assist its member companies in providing good quality SDSs. The project aimed to create practical and user-friendly tools that could be used when drafting and reading SDSs.

## Scope of the action

When the problem with the quality of the SDSs had been highlighted by the acryl amide case, the Federation asked their member companies to clarify what could be done to improve the SDSs. As a result of the debate, it was identified that an SDS is such an extensive document that the small companies, which often have only one person compiling these documents, lack a user-friendly tool to ensure that all information required for the SDS is covered in a proper way. In the public and mutual debate in the Federation it also became clear that the quality criteria for the SDS was not commonly known either. As a side project, the Federation also provided the checklist on reading the SDSs to help the readers check the quality of the provided document.

Both of the checklists were drafted by the chemical safety experts of the Federation and sent out for review to the member companies and related authorities, including the chemical inspectorate. Feedback was collected using a mailing list and incorporated into the checklists if seen as appropriate.

## Problems encountered

On the whole, the project for providing tools for facilitating the writing and reading of SDSs proceeded well and all contributing partners generally gave very positive feedback.

During the drafting process, it became apparent, however, that the needs for guidance vary among the different kinds of manufacturers and suppliers of the chemical and plastic products. The various requests for assistance in many related areas, including guidance on appropriate data sources for information required when filling in the SDSs, could not be entirely met by the Federation, and it continues to work on improving its services in this field.

## Results

The Federation published the checklists on writing and reading safety data sheets in October 2001 free of charge on their web site. The checklist on writing SDSs comprises a detailed presentation on what each of the 16 subtitles should introduce to the reader of the SDS and how the information should be written to ensure that it is explicit, accurate and unambiguous to its readers. After each point for checking when drafting the SDS, such as 'The need for antidotes that should be available at the workplace for immediate use is assessed and stated if relevant', there is space for controls and comments/remarks. Some of the more complicated subsections to fill in, such as Section 2 on 'Composition/Information on the ingredients', Section 3 on 'Hazard identification' and Section 12 on 'Ecological information', etc. are given more detailed descriptions in addition to the detailed presentation on the points that must be considered.

The checklist on the art of reading SDSs helps to assess if the provided material is accurate and explicitly presented. For instance, in the first aid measures, the checklist recommends checking whether 'the recommended measures are in line with the hazardous properties of the products, e.g. if measures like

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*The checklist on writing SDSs comprises a detailed presentation on what each of the 16 subtitles should introduce to the reader of the SDS and how the information should be written to ensure that it is explicit, accurate and unambiguous to its readers*

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*The checklist on the art of reading SDSs helps to assess if the provided material is accurate and explicitly presented*

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immediate medical assistance or 15 minutes of eye-flushing are recommended for non-hazardous products, there are reasons to question the assessment of the product's hazard properties'.

The checklists on the art of writing and the art of reading SDSs were published on the web site of the Federation in October 2001 and since then have been downloaded more than 10 000 and 6 000 times respectively.

### General evaluation

The Federation has received very positive feedback on these checklists, although it has not carried out a survey on the usability and the user-friendliness of the checklists. The checklist on the art of writing the SDSs has been submitted to the European Chemical Industry Council, Cefic, and in 2002 the checklist was translated into Finnish, English and French. The Chemical Industry Federation of Finland provided the Finnish translation, adapted to and with annotations for Finnish legislation. The IUC, the corresponding organisation in France, has done some adaptation to the situation in France.

The checklist gives a more explicit description of the 16 sections of the standard SDS than the Annex to Commission Directive 2001/58/EC of July 2001 amending for the second time Directive 91/155/EEC and laying down the detailed arrangements for the system of specific information relating to dangerous preparations in implementation of Article 14 of the European Parliament and Council Directive 1999/45/EC and relating to the dangerous substances' implementation of Article 27 of Council Directive 67/548/EC (safety data sheets). It details points that should be considered in each of the sections and emphasises several times that these SDSs are provided to the customers to help them avoid causing harm to health and the environment.

The checklists are generally good tools because they make their users think for themselves about the process of writing and what is exactly needed to prepare comprehensible and useful SDSs. They encourage people to use their common sense. The chemical manufacturers and suppliers typically know their customers and the intended use of their products rather well. They are better able to emphasise the relevant points if they consider the product and its properties themselves point by point instead of, for example, using computer programs for drafting.

The associations have received continuous requests to name the relevant information sources for reference for the SDS and for a model example of an SDS. The current Federation considers that any model examples should not be given because these examples might simply be copied without further consideration to real situations and because the possibility for imitation does not promote inventive contemplation. For information resources that could be used as reference when compiling the SDSs, the Federation compiles a list of useful information resources on its web site and distributes this kind of information via other publications as well.

Chemical safety and the quality of the SDSs was already a topic of public discussion in the early 1990s in Sweden but the tunnel construction case and the consequent actions of the chemical manufacturers and suppliers have made it an even more important topic. The Swedish Plastics and Chemicals Federation has seen that this discussion and both of the checklists create demand for better quality SDSs. Therefore, the promoted discussion can also gradually improve the quality of the SDSs.

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*When compiling a safety data sheet, you should think about what you are writing and to whom you are writing. Of course, you can use the computer program to fill in the form but then you might not use your common sense but rely on the authors of the program knowing your products better than you do yourself.  
(Greger Lundqvist, Swedish Plastics and Chemicals Federation)*

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### Identified success criteria

The Federation had good contacts with its member companies, with the relevant authorities and also a viable dialogue with its audience. Basically, the SDSs should be familiar to all of their member companies as well as their customers but it has appeared that these information sheets are considered difficult both to compile and read. The Federation managed to create recognised guidance on this difficult topic by simply asking their members what sort of help they needed with the SDSs. The Federation also utilised the expertise of its members and the relevant authorities by asking their views in the drafts of these checklists. Furthermore, the Federation decided to use the Internet for distribution and make the guidance available free of charge, for their counterparts in other European countries. This kind of open action favours discussion, public interest in the topic, and promotes confidence among all contributing partners.

### Transferability

The checklist has already been translated into Finnish, English and French and has also been made available via the Internet. Transfer of the checklists can be enhanced if one not only translates the checklist but also takes into account the specific features of national legislation. The Finnish and French translations of the checklist on the writing of the SDSs have been adapted to the national settings and also include lists of potential information sources and lists of references for the document itself. These kind of amendments make the list even more usable.

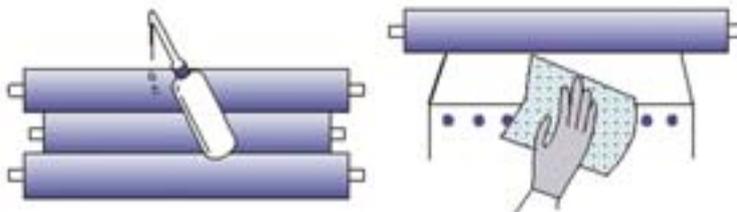
The process of drafting this kind of guidance in cooperation with members of the associations and relevant authorities requires open and good contacts between the collaborators. This kind of culture can only be created with years of open discussion.

### Contact information

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### 5.4.3. SUCCESSFUL APPROACHES AT SECTOR, REGIONAL, NATIONAL AND INTERNATIONAL LEVEL

#### Sector initiative for an organic solvent-free printing shop (from Denmark to Germany and Europe)



#### Key points

- High chemical risks in the offset printing sector during cleaning operations
- Joint sector initiative of all social partners and main producers
- Product list with prohibited and recommended product groups
- Effective transfer to other European countries

#### Introduction

Printers in offset cleaning shops are among the groups of workers with the highest exposure to volatile organic solvents. Cleaning of offset printing machines from ink requires large amounts of solvents. The printers need to manually clean parts such as ink rollers, rubber blankets, etc. During this cleaning process, the printer is exposed to high air concentrations of solvents. The use of volatile solvents with a flash point of around 20 °C was the general method up to the 1980s.

The German institution for statutory accident insurance and prevention in the printing and paper processing industry (*Berufsgenossenschaft Druck und Papierverarbeitung*, or 'BG') initiated together with the employers' federation (*Bundesverband Druck und Medien*) and the printers union (*IG Medien*), a 'Sector initiative for a solvent-free printing shop'. The initiative was based on the cooperation of employers' and employees' federations, producers of printing machines, printing equipment, cleaning devices and cleaning agents. This sector initiative is still active, aimed at further improvement and risk reduction.

## Background

Danish printers signalled very high rates of neurological disorders within their profession, more than 600 of a total of 5 000 printers suffered from this disease. In the 1980s, a small group of Danish printers developed alternatives based on vegetable oils. With their help, a European project ('Subsprint') was created to transfer this 'healthy' cleaning method to other European countries. One very crucial step in this process was the sector agreement of the employers' federation and the printers union in Germany in 1995. Since then, these vegetable-oil based products and other low volatile cleaning agents have won a high market share and even dominate now in some European countries.

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*In the 1980s, a small group of Danish printers developed alternatives based on vegetable oils. With their help, a European project ('Subsprint') was created to transfer this 'healthy' cleaning method to other European countries. One very crucial step in this process was the sector agreement of the employers' federation and the printers union in Germany in 1995*

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## Aims of the action

The reasons for such an agreement were manifold. The initial reason was the reduction for printers of the health risks caused by inhalation of highly volatile organic solvents. However, there are additional arguments. Less volatile solvents have a much lower fire risk, and fire is one of the main accident risks in printing shops. Expenditures for safe storing and handling of solvents can be reduced. Cleaning can be much more effective with certain inks and the durability of rubber blankets can be better.

## Scope of the action

### Organisation

The final and full version of this sector initiative was presented and signed at the Print and Paper Trade Fair, DRUPA, in May 1995. Since then, the sector initiative is administered by the BG. The BG publishes annually a new 'List of washing and cleaning agents for the offset printing industry — Admissible products'. The information in this list is compiled with the support of the producers of cleaning agents and printing machines. The printing machine producers contribute by providing test reports and guarantee that the products in the list can be applied successfully on their machines.

The sector initiative has so far been signed by more than 50 companies and institutions from the printing industry. These parties cover most of the relevant deliverers in the offset printing industry in Germany.

All these institutions and companies are members of the Advisory Circle, which meets annually to evaluate the progress of the initiative and discuss improvements. The Advisory Circle also comprises experts from selected areas.

### List of admissible products

The producers of cleaning agents send all their products to the BG and declare the formula (composition of the product). The formula is evaluated by a group

of experts for health concerns. The technical functionality must be tested by an institute or by the printing machine producer.

The partners agree on a list of admissible products, which is annually renewed. The list in its current form sets technical criteria as follows:

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*These products need a different and much more careful way of working. For all these reasons, it is necessary to inform and instruct the printers to raise awareness of these issues and the general level of information*

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- RECOMMENDED  
Cleaning agents based on vegetable oils, flash point above 150 °C
- RECOMMENDED  
Hydrocarbon-based washing and cleaning agents with a flash point above 100 °C
- ADMISSIBLE  
Solvent Naphtha with a flash point between 55 °C and 100 °C
- ADMISSIBLE FOR PRINTING MACHINES INSTALLED BEFORE MAY 1995 (old machines)  
Solvent Naphtha with a flash point between 40 °C and 55 °C
- NOT PERMITTED FOR PRINTING MACHINES INSTALLED AFTER MAY 1995  
Solvent Naphtha with a flash point below 55 °C (from the group of products with a flashpoint between 21 °C and 55 °C)
- NOT PERMITTED FOR OLD AND NEW MACHINES  
Special grades of petroleum spirit with a flash point lower than 21 °C

The first three categories are considered low volatility products, the rest are highly volatile. Additionally, some other criteria are applied. Some substances have strict content limits or are completely prohibited:

Content limits:  
Aromatics content ( $\geq C_g$ ) < 1.0 %  
Benzene content < 0.1 %  
Toluene, Xylene < 1.0 %

Completely prohibited substances include:

- halogenated hydrocarbons,
- terpenes,
- n-hexane,
- secondary amines and amides.

Ingredients whose toxicological and dermatological effects are unknown may no longer be present in the cleaning agents. Only products that correspond to these specifications are to be admitted to technical certification by an approved institute.

These criteria show that the initiative strongly promotes the replacement of highly volatile products by low volatility products.

The initiative was accompanied by a number of assisting measures. Press releases, focused actions to inform vocational training schools, workshops,

seminars, and articles in trade journals and the press made the technology widely known in the whole sector.

### Problems encountered

These products need a different and much more careful way of working. These cleaning agents may not reach certain parts of the machine and they also present greater slipping risks when spread on the floor. For all these reasons, it is necessary to inform and instruct the printers to raise awareness of these issues and the general level of information.

After the branch initiative entered into force, some suppliers declared that they would only sell low volatility products in future. Unfortunately others tried to win this market share with highly volatile products. They focused on selling and sales figures, not on expensive instruction measures for printers and health promotion. The fact is that volatile products have a simple economic advantage — they vanish very fast. The low volatility products are less wasteful and lower amounts are needed, which makes fewer sales possible.

It can be seen that some very small firms are still using highly volatile solvents not allowed under the initiative. The solvents are supplied by companies who sell highly volatile solvents for other purposes and are glad to have a new market in printing companies outside the initiative who have confidence in the low degree of enforcement and control.

### Results and evaluation of the action

One of the major results was the reduction of the use of volatile solvents in the offset printing branch. It was due to this industry-wide initiative that the share of volatile solvents in Germany sank from 61 to 36 % between 1995 and 2000. In Germany, approximately 20 000 to 30 000 tonnes of solvent were used for offset cleaning purposes. However, the sales figures do not give the full picture of the change that really took place. Application figures would show much higher rates for the low volatility products.

Based on the general success of the sector initiative, a similar initiative was started in the United Kingdom in 2000 where similar results are expected.

In Denmark, where the initiative against high volatile solvents began, the use of low volatile vegetable-based cleaning agents was already approximately 30 % by the middle of the 1990s.

The BG sees the branch initiative not only as an improvement for health and safety but also as an improvement of its reputation. They used an innovative approach to create step by step the solvent-free printing shop.

A much better practical standard can also be achieved in voluntary agreements if the sector is motivated to invest time and resources. The sector initiative was welcomed by many parties — employers, for example — as a step towards less central State regulation and more and better self-regulation. However, the measures of the initiative can be enforced via the BG, which has a legal enforcing competence.

Following trial periods, the standards of the sector initiative function as the new technical standard. These standards can be enforced as the state of the art the companies have to follow.

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*The use of less volatile solvents for cleaning of the equipment is a good example of how safety and health and the environment can go hand in hand.*  
(R. Genter, Chairman of the Workers Council Druckhaus Schlaeger)

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*The use of emission-reduced solvents as cleaners in offset printing was successful mainly owing to the commitment shown in the sector initiative. (Heidelberger Druck, official statement in Heidelberger Dialog)*

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### Identified success criteria

The information and instruction for printers are seen as crucial. Handling requires a different and more cautious working method and a few new skills. Printers like to learn from printers. Practical demonstrations inside companies had the largest success. The dissemination of these good practices is very important for the nationwide success in the sector.

Using new technologies requires a certain level of knowledge that is safe and good enough to allow initial practical applications. Before that stage, enthusiasm (as the Danish printers and later on many other printers in Europe showed) or public support (as with the Subprint project) is needed. Practical work and scientific development have to go hand in hand.

Integration of new products requires cooperation within the whole sector, to avoid mistakes and serious incompatibilities.

From a technical point of view, participation of the large printing machine producers was crucial for the success of the sector initiative. They committed themselves very early and used their market power to put pressure on the other equipment suppliers — inks, rollers, washing devices, cleaners, etc. — to participate too.

From a social point of view, it was crucial that both employers' and employees' federations became signatory parties to the initiative.

### Transferability

#### Germany

The initiative was successfully adopted by the German *Länder* ('states'), which are responsible for labour inspections. They published a guide for all their labour inspectors and the printing companies.

The north German metal industry agreed on a similar initiative to promote the use of low volatility and water-based products for metal surface cleaning operations.

Although the sector initiative was voluntary, the standard of technology could be defined in much more detail. It has shown that substitution in this case was possible. Therefore, every printer has to comply with these regulations according to the general principle that substitution of a hazardous chemical has to be done — if it is feasible and reasonable.

#### Europe

Many Member States have started similar initiatives.

- Based on this success, a similar initiative was started in the United Kingdom in 2000.
- Denmark had already issued a regulation in 1994 on using low volatility products in the cleaning of offset printing machines whenever possible.
- Other countries are promoting the use of low volatility products based on the experiences collected up to now (see list of contact details).

The German *BG Druck and Papierverarbeitung* has, based on this success and European experiences, started an initiative to promote the safe use of UV inks. The use of UV inks also represents a solvent-free solution but might involve some new risks. Until now, this UV protocol has been signed by national health

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*If something new really works and is also economical in the long run, progress in health and safety is much easier. (Bernhard Küter, BG Druck and Papierverarbeitung)*

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and safety institutions in Germany, the UK, Italy, France, Belgium, Switzerland and Spain (Health and Safety Executive (HSE), United Kingdom; Istituto Superiore per la Prevenzione e la Sicurezza del Lavoro (ISPESL), Italy; Caisse Nationale de l'Assurance Maladie des Travailleurs Salariés (CNAMTS), France; Federal Ministry of Employment, Belgium; Schweizerische Unfallversicherungsanstalt (Suva), Switzerland; Instituto Nacional de Seguridad y Higiene en el Trabajo, Spain).

## Contact information

### 1. Germany

(a) Branch initiative

Bernhard Küter

Berufsgenossenschaft Druck und Papierverarbeitung

Rheinstr. 6–8

D-65185 Wiesbaden

<http://www.bgdp.de>

Publications: 'Washing and cleaning agents for the offset printing industry — Admissible products', Order No 522e (English version) 4/2002

(b) Regulation in Germany

Publications: 'LASI Leitfaden No 12: Guide for substitutes and restriction of chemicals in the cleaning of offset printing machines'

<http://lasi.osha.de>

(c) Practical instructions on the Internet in several languages

Kooperationsstelle Hamburg

<http://www.kooperationsstelle-hh.de>

(click on 'Working areas — Substitution of dangerous substances — Substitution in practice, Subprint')

Instruction manual in seven languages.

### 2. Denmark

'Brug af ikke-flygtige afvaskningsmidler i offset- trykkerier'. At-cirkulæreskrivelse No. 7/1994 ('Use of non-volatile cleaning agents in offset printing shops')

This is general guidance from the central labour inspectorate (AT) from 1994 for labour inspectors and companies. In general, the companies have to comply with it.

<http://www.at.dk/sw4996.asp>

### 3. United Kingdom

HSE published in 2000 the 'Solvent substitution scheme 10/00', which basically requires the use of less volatile cleaning agents with similar rules to the sector initiative. <http://www.hse.gov.uk/pubns/solvent.pdf>

HSE has also included these measures in their guide for the printing industry ('Printing COSHH'); see HSE 2000: 'Control of chemicals in printing: COSHH Essentials for printers' <http://www.hsebooks.co.uk>

#### 4. Spain

(a) ISTAS, OSH and the environmental institute of the Spanish trade union CCOO has promoted the use of less volatile products in certain articles and leaflets.

(b) Basque country

In the Basque country, the results of Subsprint have been published in a leaflet under the title *Disolbatzaile Organikoen Ordezkapena Industrian*.

## GISBAU <sup>(12)</sup> — Support for the safe use of chemicals in the construction industry (Germany)

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### Key points

- Chemical risks in the construction sector
- Information system and assessment criteria for products and substances
- Automatic creation of mandatory instructions and product lists
- Fully available in English and German. Workers' information in 11 other languages

### Introduction

In the construction sector, chemicals are among the daily working materials of construction workers. In every single profession related to construction, a large number of different substances are used. The chemical products used cover a broad range, as diverse as:

- silicon containing biocides for sealing purposes;
- harmful fibres for insulation;
- acids for cleaners of facades;
- chlorinated solvents as graffiti removers;
- wood dust for carpenters;
- corrosion additives for painters;
- bitumen for roof layers.

In addition, certain materials from natural sources used in construction, such as cement or insulation fibres or substances originating from the work processes, like wood dust, have hazardous properties. For example, in the case of cement the natural content in chromium can cause contact dermatitis to exposed workers.

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<sup>(12)</sup> GISBAU is the German acronym for *Gefahrstoffinformationssystem Bau* ('Hazardous materials information system for the construction sector').

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*The development of the easy to understand Giscode labelling system was the breakthrough in reaching workers in the workplace.  
(Norbert Kluger, GISBAU)*

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*Together with GISBAU, we work in certain areas for the safe use of construction chemicals.  
(Association of Producers of Construction Chemicals (Deutsche Bauchemie) in the Sector Agreement on Chromate in Cement)*

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### Background

In 1989, the German injuries insurance institutions of the construction industry (Arbeitsgemeinschaft der Bau-Berufsgenossenschaften) began to develop GISBAU. The Bau-Berufsgenossenschaften are part of the statutory OSH system in Germany.

Set up in cooperation with the whole sector, GISBAU is an information system designed to diminish the risks from construction chemicals and to provide support to the many small and medium-sized enterprises (SMEs) in the construction industry. It offers comprehensive information about dangerous chemicals used in building, reconditioning and cleaning, including operating instructions, guidance and brochures related to the different work activities, and a coding system, the Giscode. As a central service unit of the construction injuries insurance institutions, GISBAU today provides free support for various tasks in the management of hazardous materials to the 200 000 enterprises in the German construction industry. GISBAU is cooperating with the whole sector in an aim to reduce the risks from construction chemicals.

The most prominent product of GISBAU is a CD-ROM (called Wingis), which contains SDS-like data on about 400 product groups and more than 20 000 substances or products.

### Aims of the action

GISBAU was created to help construction enterprises deal better with construction chemicals and to reduce the risks from chemicals for the workers through information on risks, protective measures and legislation.

Most of the construction enterprises in Germany — as in all EU Member States — are SMEs. They have to pay attention to a large number of legal obligations. The management of adequate safety and health measures for so many products very quickly becomes a burden for these SMEs. To carry out these duties, companies need fast and easily accessible knowledge on chemistry, and safety and health regulations.

### Scope of the action

At the beginning of GISBAU's work in the early 1990s, the main focus was on information in the form of electronic safety data sheets. Currently, through Wingis, GISBAU provides support for various tasks connected to the management of hazardous materials in the companies. Emphasis is increasingly put on interactive use and 'sector-wide solutions' for the safe use of hazardous materials.

Workers and employers can consult the regional inspectors if there are any questions concerning dangerous substances and the GISBAU system. GISBAU works in the background as a central service and provider of the information and the risk management tool.

### Content

Wingis comes on a CD-ROM and can be widely adapted to the user's needs. As a first step, users can define their job/position within the company and accordingly their information needs. The job categories are:

- employer,
- occupational physician,

- supervisor,
- OSH committee.

The user can also choose between different sectors and subsequently product groups within these sectors. In the current version, 17 areas and the corresponding product groups are accessible.

The user gets SDS-like OSH information on products, product groups and substances. The supplied information varies slightly in its quantity and structure according to the type of user (employer, etc.). The full set of information contains the following:

- Product information header, including the name of the product as well as the essential contents according to the identification
- Characterisation of the product, classification in a product group
- Threshold limit values for substances contained and classification of the single components
- Monitoring methods for the hazardous substances
- Health risks (short version for the user groups 'employer', supervisor', 'OSH committee')
- Toxicological profile of the effect (longer version of 'health risks', if the user category 'occupational physician' is chosen)
- Hygiene measures
- Technical and organisational protective measures
- Personal protective measures
- First aid
- Restrictions on use (legal constraints)
- Emergency instructions in the event of damage to the packaging
- Handling and storage
- Preventive medical check-ups including biological monitoring
- Employment restrictions
- Transport of dangerous goods
- Product disposal
- Recommendations for substitute substances, substitute products or substitute procedures

Search functions make it easy to find the product or substance of concern — or at least to find information about the product group.

#### *Support for risk management*

The system is not merely a simple information source but also a tool for risk management. It supports risk management activities which are mandatory according to the German legislation by providing:

- standardised safety instructions for workers, and
- a hazardous materials inventory.

If additional data are fed in by the user — such as the name of the user company and the name of the construction site — the system also automatically prints out specific instruction sheets for the construction site in question. In this way it helps the enterprise in producing documents required by law. Additionally Wingsis provides general or background information about certain risks areas. Most of the information is now available in English.

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*The system is not merely a simple information source but also a tool for risk management. It supports risk management activities*

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The instruction sheets can be printed in 13 languages for foreign workers, including some of the main European languages and Croatian, Czech, Polish, Romanian and Turkish. Of course, even more languages would be desirable but finances are a problem in this respect.

### *The Giscode labelling system*

As part of an efficient risk-reduction approach, GISBAU also provides a coding and labelling system, the Giscode. It should assist users in finding the least hazardous products and substitutes. Giscodes have been developed for 13 main product groups.

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*The Giscode figures inform the user about the hazardous properties of a product within a certain product group. Giscode attempts to define hazard classes, giving an indication of protective actions recommended when using the product*

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The Giscode figures inform the user about the hazardous properties of a product within a certain product group. Giscode attempts to define hazard classes, giving an indication of protective actions recommended when using the product. The code labels are based on the composition of the products.

The code itself consists of one or two letters and a number from 1 to 9 or 10 to 90. For example, PU50 stands for 'Polyurethane, solvent based, harmful, sensitising'.

The information about the product is delivered by the manufacturers.

In a voluntary agreement, the three parties — employers, unions and producers — administered by the GISBAU team, agree on criteria for product groups and codes. The definition of the criteria for the codes is often a long-lasting process between the different parties. The criteria are published on the GISBAU homepage and on the Wingis CD-ROM under 'GISBAU plus' where background information is provided. The code labels are established by agreements between work insurance organisations and industry trade associations. The first Giscode labels were established in 1993.

The use of the 'Giscode label' is administered by the respective manufacturer and notified to the GISBAU organisation. Manufacturers of construction chemicals voluntarily label their products according to the Giscode system, with approximately 80 % adopting the system. They also confirm whether their product meets the criteria of a certain Giscode.

In addition, Giscode contains a number of sub-codes that give even more precise information. For example, in the case of construction adhesives four groups with sub-classifications exist, as follows:

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*In a voluntary agreement, the three parties — employers, unions and producers agree on criteria for product groups and codes*

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#### *Example: Giscode category — Adhesives and primers solvent contents:*

- D 1 Dispersion based, free of solvents
- D 2 Dispersion based, low solvent contents, free of aromatics
- D 3 Dispersion based, low solvent contents, free of toluene
- D 4 Dispersion based, low solvent contents, containing toluene
- D 5 Dispersion based, containing solvents, free of aromatics
- D 6 Dispersion based, containing solvents, free of toluene
- D 7 Dispersion based, containing solvents, containing toluene
- RU 1 Polyurethane based, free of solvents
- RU 2 Polyurethane based, low solvent contents
- RU 3 Polyurethane based, containing solvents
- RU 4 Polyurethane and solvents based

### Availability and dissemination

The CD-ROM is free for construction enterprises and costs a small fee for other interested parties. GISBAU provides general information on the Internet but the substance-specific search and the risk management tools are only available on CD-ROM. The distribution number varies between 30 000 and 40 000 copies per year.

GISBAU acts in OSH committees, provides policy advice, and promotes OSH activities through workshops and folders. GISBAU depends mainly on good cooperation between employers, unions and the producers of chemicals. All three parties have decided together to help SMEs cope with the legal requirements of handling chemicals and continuously minimise the risks.

### Problems encountered

It can be assumed that a large number of enterprises and workers are still not reached by GISBAU. The difficulties of enforcement in this sector make it very difficult to measure success and problems. There is no doubt that lack of awareness about chemical risks and diminished concern regarding legal compliance are widespread.

Smaller producers of construction chemicals might not cooperate with GISBAU, but the larger producers fulfil the information demands from GISBAU and also participate in the development of the criteria for Giscodes.

### Results

GISBAU is one of the most successful OSH software programmes in Germany. The Giscode label is voluntary and spread mostly within the construction trade and related fields. With its 30 000–40 000 copies annually, Wingis theoretically covers up to 20 % of the 200 000 construction companies. Most of the Wingis CD-ROM goes to multipliers — copying of the CD-ROM is not restricted — and the real coverage might even be higher.

Due to this widely known system, there is some pressure from the market to use labelled products only. More than 80 % of the manufacturers of construction chemicals participate in the system. The four main producer associations — for paints, adhesives, cleaning agents and construction chemicals — support the GISBAU approach.

### General evaluation

GISBAU is also proactive in the field of risk reduction. It has been deeply involved in the development of sector agreements, e.g. for chromium-reduced cement. GISBAU states that it has learned a lot from regulations in other European countries such as for chromium from Scandinavian countries, for solvents from Austria, or for dust from the Netherlands.

### Identified success criteria

A key for success is also that GISBAU not only provides single product or substance information but also comprehensive and integrated product group information. Based on Giscode a worker in a certain profession might handle eight to 10 product groups and their codes instead of 50 or 100 products with their respective SDSs. This system makes it much easier to analyse the risks and to apply safety measures.

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*Actually, Bau-BG and GISBAU are very committed to the issue of paint removers that are free of methylene chloride. GISBAU has promoted the use of methylene chloride free products for many years. Unfortunately, the market reacts very slowly, not to say negatively. (Gerald Altnau, chemist, DuPont Germany)*

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*With its 30 000–40 000 copies annually, Wingis theoretically covers up to 20 % of the 200 000 construction companies*

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The success of GISBAU depends also on the willingness and cooperation of the social partners and the producers. These three parties see it as their task to deliver information to the SMEs, which could not manage a correct handling of substances without such a support. In a macroeconomic view GISBAU saves a lot of resources because information is provided for a large number of companies, who would need to make a big effort to get this information on their own.

### Transferability

Most of the information is now available in English. The instruction sheets can be printed in 13 languages for foreign workers, including some of the main European languages and Croatian, Czech, Polish, Romanian and Turkish.

Recently the GISBAU approach has been adopted in other industrial sectors. Gischem is a new and very similar system for certain sectors of the chemical industry, e.g. the production of PUR-Foam. It is run by the Industrial Injuries Insurance of the Chemicals Industry and is completely Internet based. This is no problem for the chemical industry because most of the workplaces are connected to the Internet, whereas in the mobile construction industry a CD-ROM fits the user needs better.

The approach can also easily be transferred to other sectors and countries. The risks and the work environment will probably be very similar in all EU Member States.

### Contact information

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<http://www.gisbau.de>

CD-ROM Wingis 2.2.  
Available from GISBAU for construction companies  
Available for others from:  
BC GmbH Verlags- und Mediengesellschaft  
Kaiser Friedrich-Ring 53  
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Tel. (49-611) 95030-0  
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*Most of the information is now available in English. The instruction sheets can be printed in 13 languages for foreign workers*

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## Evaluation of biological risks in the meat processing industry in Brittany (France)



### Key points

- Evaluation of biological risks in the meat processing industry
- Step-by-step examination of the risks, aggravating and minimising factors
- Promotion of hygiene practices at local and national level
- Practical information on risk assessment of biological agents

### Introduction

On 28 November 2000, the Regional Health Insurance Fund (CRAM) of Brittany applied to the Department of Study and Medical Assistance (EAM) and the Department of Chemical and Biological Risks (RCB) of the National Institute of Scientific Research (INRS) for assistance in the assessment of biological risks in a meat processing factory in Brittany. This factory belongs to a larger group of enterprises and consists of four units in Brittany, two store warehouses, and two plants for processing dead animals and raw materials into meat and bone meal. The factory processes about 1 000 tonnes of dead animals and raw materials per day.

<sup>(13)</sup> Decree No 94-352 dated 4 May 1994 concerning the protection of workers exposed to biological agents and the Ministerial Decision dated 18 July 1994 defining the list of pathogenic biological agents (amended 17 April 1998 and 30 June 1998) serve as the basis for national policy on this subject.

The INRS collated information about meat processing and the related biological risks. The evaluation of biological risks was based on:

- two visits organised in conjunction with the Committee for Hygiene, Safety and Work Conditions (CHSCT) of the four units on 6 February and 6 March 2001;
- analysis of work sites carried out by the members of the CHSCT with work site cards and video displays;
- intervention by INRS specialists in a meat processing plant on 25 April 2001.

This project was presented by INRS on 14 June 2001 at a special meeting held by the CHSCT.

To support future risk assessment efforts, the INRS, the National Fund for Sickness Insurance of Employees (CNAMTS), the Central Mutual Fund of the Agricultural Community (MSA), and the Ministries of Labour and Agriculture undertook the task of providing a step-by-step guide for the evaluation of biological risks in the meat processing industry.

### Background

The basic reason for initiating this action was the need to define the biological risks that exist in the meat processing industry<sup>(13)</sup>. It is important to understand the principles for evaluating the type of risks associated with these activities. The main issues involved in risk assessment included the sites where the workers came into contact with the dead animals and raw materials ('unclean area'), the sites after baking ('clean area'), dressing and changing rooms, matters of general hygiene, maintenance and repairs. Following European legislation, the biological agents were classified under four groups (1, 2, 3 and 4) depending on their pathogenicity to humans, risk to workers, ability to propagate, and the existence of protective measures or effective treatment. According to this scheme, biological agents belonging to group 1 do not exhibit risk of infection. Agents belonging to groups 2, 3 and 4 are pathogenic. Some micro-organisms belonging to group 3 are not normally pathogenic when inhaled. These are identified by an asterisk.

Several animal infections can result in occupational diseases in the meat processing industry. For example *tuberculosis*, *brucellosis*, or *anthrax* belonging to group 3, *streptococcus suis* or *leptospirosis* belonging to group 2. The main sources of these diseases are the genital system (organs, placenta, foetus, foetal fluid, etc.), the digestive tube and its contents. The transmission of micro-organisms from animals to humans can occur by bringing hands or infected objects to the mouth, by the splashing of fluids into the eyes, through cuts, punctures and skin abrasions, unprotected wounds and injuries, and respiration of fine particles suspended in the air. The risk of contamination depends on the concentration of the pathogenic agents and their nature, the type or the part of the animal, and the nature of the infected fluids.

### Aims of the action

The aim was first to identify and locate the risks and then to determine the possibility of exposure due to wounds, splashes of fluids in the eye, or aerosols. This was to be quantified by determining the number of exposed workers, the frequency of exposure, and the severity of the effects. It was also important to determine those factors playing a role in limiting or enhancing exposure and thus describing work practices and procedures.

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*The members of CHSCT made a decisive contribution in developing tools for actual risk prevention, thereby greatly facilitating the project.  
(Colette Le Bâcle, INRS)*

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Apart from these goals, the company hoped to improve risk perception among workers through general and specialised training at work, a new strategy for the reduction of risks and the introduction of protective measures.

Given that risk assessment is required by legislation, a group of organisations sought to use this experience and provide a documented and concise guide for the evaluation of biological risks in the meat processing industry. This text could facilitate the task of the safety engineers and occupational physicians in the assessment of risks.

### Scope of the action

The evaluation of biological risks in this project has been targeted to include a number of meat processing plants in Brittany. The risks involved in each step of the process were analysed in order to identify different groups of workers within the plants according to their activities.

The first activity involves the gathering of dead and slaughtered animals from farms. A request is made by the farmers to the public service for meat processing (SPE). The SPE then organises lorries for the transport of the carcasses to the plant sites that, owing to their design, could pose different levels of risk to the workers. The major risks come from direct contact with the dead animal or from spattering of fluids. Exacerbation of risks occurs when there is a time delay between the death of the animal and its collection, when the cause of death is unknown, during high workload and generally when hygiene conditions are not optimised (washing hands, protective clothing, etc.). As in all situations, the factors minimising risks include experience and training of workers and the introduction of new and safer technologies for lorries.

The second step is unloading and sorting out the carcasses. Important health factors may be involved if the animal is accidentally dropped on an unclean area and if fluids are amassed in the transport trays.

The third step involves activities around the silos. The main risks here are falls from unprotected silos and the production of toxic gases from fermentation. In the absence of gas detectors and ventilation systems, this could be potentially dangerous.

The next step is the breaking and smashing of flesh and bone. The main risk here arises during maintenance or breakdown of machinery.

Other steps in the process include the detection of ferrous metals and non-ferrous objects, skinning calves and cows, washing lorries, collection of specific bovine material, the culling of animals suspected of having bovine spongiform encephalopathy (BSE), and autopsy. Particular attention is given not only to cleaning and disinfecting the lorries but also the work floor space.

The 'clean area' of the plant includes baking the meshed flesh and bone and then pressing, grinding the material to a fine powder before sieving. The potential problems arising from these automated processes are no longer from infections but from the escaping of fine particles in the event of malfunction.

The main concerns in the dressing and changing rooms are the number of clean working clothes, their provision and how often they are cleaned.

Other aspects of general hygiene include the hindrance encountered when cleaning the work areas, the efficiency in disinfection, passage from the

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*The members of CHSCT took an active part in prevention by publishing notes describing model practices for each job type and activity, and by producing a videotape on hazardous body movements. (Isabelle Balty, INRS)*

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'unclean' to the 'clean' area, smoking, etc. Maintenance and repair procedures were also examined.

During the course of the action a number of processes were videotaped and documented.

The publication of a booklet entitled 'Why and how to evaluate biological risks' is a tool for producing a framework within which this type of risk can be estimated.

### Problems encountered

In most instances, problems arise due to differences between the prescribed working conditions and the actual situation. In this circumstance, this becomes apparent when outside factors (e.g. farmers) are involved. The delivery of the animals rarely occurs according to a regular timetable, thereby changing the rhythm of work and making the risk assessment process more difficult.

### Results and evaluation

It has been ascertained that biological risks do exist in the meat processing industry. These risks have only recently been identified and classified as belonging to groups 2 and 3. BSE also constitutes an important risk. Nevertheless, there have been no reported cases of occupational infections. One unit should integrate the proposals arising from this risk assessment into its management system in order to protect the health of the employees covered by the Regional Health Insurance Fund (CRAM) of Brittany in collaboration with the occupational physician. The other units should also integrate considerations on biological risks.

The information obtained was collated and became the basis for the development of a series of seminars and lectures on biological risks in the meat processing industry, not only on a local level but also at national level. Concepts of risk assessment and prevention were also introduced in various sectors of the industry that exhibit different and/or local characteristics. To support this effort, the booklet proved to be a valuable asset for those involved in biological risk assessment.

### Identified success criteria

All the participants in this action (CRAM, INRS, CHSCT) played their respective important roles in instigating, coordinating, facilitating and executing the different phases of the project. The evaluation of biological risks is a relatively new practice and its application in four plants offered a new field of experience for both the company and the institute. The experience and knowledge obtained has encouraged the participants to pursue this line of action in other similar cases. The importance of the presence of an occupational physician was realised and an attempt was made to ensure that, if one was not permanently present, he would visit the plant on a regular basis.

The booklet published by INRS, CNAMTS, MSA and the Ministries of Labour and Agriculture was met with great success. Each of these institutions distributed the booklet to meat processing plants and health and safety professionals in other regions. The information contained could become a useful tool for all those associated with risk assessment in the meat processing industry.

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*This action, performed in one enterprise, could serve as a basis for further thoughts and considerations for the entire sector.*  
(Colette Le Bâcle, INRS)

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### **Transferability**

It is obvious that the action could be reliably transferred to other regions of the country which have similar activities. Legislation is already promoting the evaluation of biological risks. Actual application is imperative, especially when animal diseases can easily be transmitted to humans. Given that financial support is available together with an established communications network among similar industries, extension of the action could be greatly facilitated. The same concept could be applied to monitor and thus assess the industry at European level. This could be achieved by promoting cooperation among national services dealing with meat processing, by exchanging experience and know-how, and by adopting policies already proved to be effective.

### **Contact information**

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## LAB-link — The human resource in the laboratory environment (Denmark)

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### Key points

- Combination of conventional communication tools with the modern ICT technology
- Networking between all relevant bodies both online and in joint meetings
- Nurturing of fact-based discussion can lead to changes both in legislation and attitudes

### Introduction

LAB-link is a system for communicating on working environment matters in the Danish laboratory sector. The system, integrating both conventional contact tools and modern Internet facilities, has been created (and is continuously maintained) by the project 'LAB-link — The human resource in the laboratory environment'. This project was set up by the Danish Laboratory Technicians Union in 1994 and has worked in cooperation with several collaborating partners representing authorities, employers and employees, and related training organisations such as universities and technical schools. The project is funded by European Social Fund grants, the ATTAK programme, the Laboratory Technicians Union, the Sector Work Environment Council for the Industry, and several companies with laboratory activities, including Novo Nordisk A/S in Denmark.

### Background

Laboratory work is typically linked to a whole variety of working environment problems, including ergonomics, risks connected to the use of dangerous substances such as biological agents and chemicals, and job stress. The demands for accuracy and independent work to a tight schedule are high and the work has a tradition of rather isolated work routines. Furthermore, laboratory technicians are part of a hierarchy, where great responsibility regarding the work procedure seldom leads to a corresponding authority to make changes for safer working conditions.

It has been known for many years that the laboratory working environment is potentially dangerous. In 1984–85, a Danish research project documented a series of risks related to the work of technicians and several adverse effects

caused by exposure to these unhealthy working conditions, most strikingly an increased risk of miscarriage of up to 40 %. The results enjoyed wide publicity and raised much debate. Furthermore, a Labour Inspectorate campaign in 1993 revealed that many laboratories, including university laboratories teaching students to lead and supervise technicians, hardly met even the minimum requirements of the Danish Working Environment Act. There were also severe deficiencies in the communication and training procedures. For example, workers complained that they had been poorly introduced to their work, and safety data sheets (SDSs) were often not easily available.

Subsequent attempts to train laboratory technicians were met with an increasing range of chemicals, a larger complexity in the variety of the tasks, and the appearance of some 'new' risks, e.g. repetitive strain injury (RSI). As a secondary effect, the increased training in work environment matters, together with a strong motivation among laboratory workers to take supplementary vocational courses on work environment factors, created frustration when attempts to improve working conditions were not successful.

In 1994, the competent assembly of delegates within the Danish Laboratory Technicians Union, which has 11 000 members, decided to set up the LAB-link project, which put a renewed focus on the whole laboratory area, enabling more focused communication on the working environment matters and collaboration between all concerned groups.

### Aims of the action

The promoters of LAB-link believe that intense dialogue about the working environment within the laboratory field can inspire solutions for workplace matters. LAB-link aims to strengthen and enhance the existing knowledge in the workplaces by visualising results that encourage further improvements. Shortcomings and weaknesses that require specific attention should also be assessed by establishing close communication within and close to the laboratory sector.

The LAB-link project tries to reach individuals as well as private and governmental organisations concerned with safety in the laboratory sector; employee, employer, authorities, universities and other training bodies as far as possible. The ultimate goal is to achieve a perceivable change of attitude within the area leading to a greater responsibility towards work procedures, again resulting in greater safety, better health and increased well-being.

### Scope of the action

In 1998, the LAB-link communication system was centred on the web site <http://www.LAB-link.dk> after a pilot phase during which 11 partner organisations, representing relevant trade unions, employers, authorities and educational bodies, had a chance to give feedback on the proposed structure and contents of the system. The project is ongoing with co-funding from several Danish companies.

The web site was created and is now managed on a full-time basis by a webmaster and project leader with experience in laboratory work and working environment matters. The functions of the web site have been designed to support communication and are free to use by anyone interested. In addition to the web site, the project leader gives training in the use of Internet to interested groups and answers users' inquiries on the use and contents of the web site both over the phone and via e-mail.

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*The LAB-link idea is built upon the conviction that communication within the work environment area needs support to progress. The system offers this support in the shape of interactive tools, of a possibility for direct information, tuition or coaching whenever needed or asked for — and a mediator in the middle at all times for both here-and-now questions and for passing on more complex problems to authorities or other parties.  
(Susanne Binzer, LAB-link project leader)*

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*Although the concept is very simple, the reality is new. It complicates the marketing process that there is so-to-speak "nothing to compare with". The system is often seen as a mere one-way information homepage. When I present the possibility of direct mediator help (at courses or demonstration occasions for instance) it is repeatedly met with great positive surprise. (Susanne Binzer, LAB-link project leader)*

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*A central feature of the site is the LAB-link Forum. In addition, the site provides hyperlinks to interactive training material ('LAB-Learning'), other relevant resources on occupational safety and health matters ('Links'), an 'Events calendar' and 'Hotline' service for questions directed at the webmaster*

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A central feature of the site is the LAB-link Forum, where registered users can submit their questions and debate matters related to the working environment. The webmaster stores the debates under categories of working environment matters and passes the questions on to the experts in the field. Often, the answers to these queries on alternative safe solutions for the workplace are stored in the 'Videnbank', the database that compiles related articles. In addition, the site provides hyperlinks to interactive training material ('LAB-Learning'), other relevant resources on occupational safety and health matters ('Links'), an 'Events calendar' and 'Hotline' service for questions directed at the webmaster.

LAB-link has also actively applied more conventional communication tools in campaigning on certain OSH issues, such as in the case of peroxide formers. Peroxide formers, such as diethyl ether and di-isopropyl ether, are classified as dangerous substances but the safety procedures of their waste processes have often ignored their explosive nature. In 1998, the Danish Laboratory Technicians Union interviewed chemists and other experts in the field and revealed in a series of articles that these dangerous substances are often treated carelessly if considered waste. Consequently, the LAB-link opened a Danish campaign on peroxide formers in 2001, aiming to reduce the risk posed by this explosive waste material and to establish a better organised national system for handling these substances. There were no written guidelines on how to handle and store these substances, although they are explosive according to risk assessment.

The LAB-link project raised awareness of the issue by mailing, telephoning and e-mailing the Bomb Squad Division, the Danish Emergency Management Agency, the Army Operational Command, Defence Command Denmark, the Ministries of Justice, Defence, the Interior, and the Environment, the Danish Environmental Protection Agency, central and local health and safety inspectorates, local police authorities, and several consultative authorities, among these Kommunekemi A/S, the Danish central plant for treatment of chemical waste. Additionally, documentation on peroxide former waste was mailed to the members of the Laboratory Technicians Union and the Association of Medical Laboratory Technologists and published on the LAB-link conferencing system and in several trade union chemical and technical journals.

### Problems encountered

In the setting-up phase, the project suffered from technical problems related to the development of the databank; Internet was at that time a new interface for dealing with these kinds of items and a couple of contractors failed to meet the agreed criteria for the databank properties (as well as for the conferencing system). This delayed the launching phase, and deficiently functioning web sites may have expelled some visitors to the site and reduced the number of return visits. Eventually, the site's webmaster managed to create a workable site structure and system in cooperation with the project partners.

Many collaborators appear to have been reluctant to openly discuss their OSH issues in a public forum. The project leader believes that this requires a change in culture and will take time.

The project has not received the expected wide attention from the public media, such as newspapers, radio and television, not even during the peroxide formers campaign, despite the importance of the issue and the size of the group concerned.

## Results

In 2000, the Danish Centre for Alternative Social Analysis (CASA) evaluated the project and interviewed laboratory technicians on the usability and use of the site. In February 2002, the LAB-link system had 350 registered users and 4 000–5 000 visits per month. At that time, the web site had only existed in a proper form for six months. There is also an ongoing evaluation project.

The peroxide formers campaign lasted for one and a half years and, as result of the wide debate, the Danish Working Environment Authority enforced new 'Guidelines on dangerous wastes', where explosive wastes are introduced separately, with guidelines on how to treat recognised explosive wastes in a laboratory environment. The Authority has also published more material on its web site. Many companies and laboratories have introduced new policies and rules for peroxide formers for their workplaces.

## General evaluation

Overall, the project has succeeded well in terms of promoting discussion on the OSH issues, and the campaign on peroxide formers has had a remarkable and practical output. The number of visits is increasing and more and more workplaces are getting to know the system as it has acquired a good reputation. The LAB-link system is useful for campaigning on specific themes like peroxide formers and substitution, and is flexible owing to its online editorial and hotline services. It also effectively combines a library of documentation on various kinds of OSH issues and a discussion forum, providing a centralised source of information for day-to-day use by laboratory technicians and related groups. Training in the use of the Internet and the LAB-link system provided by the project leader has improved the visitors' capability and interest in this communication feature.

Both employers and employees support the project. However, the collaborating partners have unexpectedly not taken an active role in the LAB-link system. In the initiation phase, it was expected the collaborators would begin more active networking with each other but so far this has been considered too time-consuming and difficult.

The LAB-link has not even gained popularity among technicians and foremen with often higher education levels. The project will soon study why the LAB-link has not been as popular among technicians as it has been among their managers.

Lack of wider public interest in the peroxide former campaign may prove that occupational safety and health is not yet an issue for the mass media, although the press could have responded to several common themes such as the effectiveness of cooperation between the authorities and common safety in the laboratory sector. On the other hand, the LAB-link system has only been active following its pilot phase for four years now.

## Identified success criteria

The LAB-link project has proven that a full-time webmaster with relevant experience and training for the profession, i.e. the work of laboratory technician, and knowledge in occupational safety and health issues, can promote, nurture and sustain discussion and mutual learning with this kind of conferencing system.

It has been thought very beneficial to the project that the LAB-link project has also been actively promoted with training events both in the use of the Internet

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*When the system was launched, we thought that the conferencing system would be a great "hit". But the relatively short LAB-link history has shown that only strong motivation stimulates use of the LAB-forum. This part of the system is, however, an important feature and has so far generated over 50 "results", which can now be found in the database (the Videnbank) in a summarised version.*  
(Susanne Binzer, LAB-link project leader)

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*It takes time to build up a reliable network based on the exchange of often very sensitive information but I am convinced that this communication kit can promote and sustain future positive development within the work environment area — if given enough time.*  
(Susanne Binzer, LAB-link project leader)

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and the conferencing system. Personal contacts make the entire communication network more attractive to people, who often feel too busy or are otherwise a bit reluctant to study new Internet or OSH features by themselves, even when these features could help them with their everyday tasks.

One of the success factors is also the possibility for getting information both on general solutions for every laboratory and on very specific OSH items: the webmaster and moderator can contact an expert in the particular OSH area and can either send the correspondence privately to the visitor or, if allowed by the visitor, publish it on the web site.

### **Transferability**

The LAB-link communication system is adaptable to any country and any sector with sufficient Internet facilities. In September 2001, LAB-link opened a new conferencing system called 'Labsafetyeurope' at <http://www.labsafetyeurope.org>. 'Labsafetyeurope' is maintained and administered by LAB-link and it seeks to adopt the successful model of LAB-link into the European-wide debate on laboratory safety and working conditions.

When transferring this kind of system to new settings, one would benefit from cooperating with the key persons in the sector and OSH areas.

### **Contact information**

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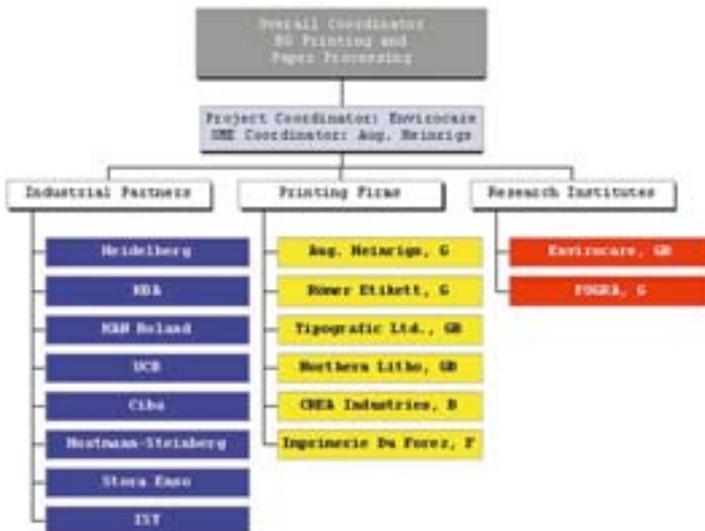
# Uvitech — UV curing technology in the printing industry (Belgium, France, Germany, United Kingdom)

## Key points

- Many printing firms are very interested in using UV curing technology but most SMEs are generally not in a position — from a financial or organisational point of view — to implement measures to optimise their health and safety protection for printing with UV inks and lacquers
- The results of this project will give SMEs in the printing industry a template on which they can build their improvements
- The final report will be presented in the context of a European conference

## Introduction

Many printing firms are very interested in using UV curing technology. The reasons for this include: the possibility of processing the printed works immediately owing to the much faster hardening of the UV inks and the very high abrasion resistance of the printed matter. However, most SMEs are generally not in a position — from either a financial or organisational point of view — to implement measures to optimise their health and safety protection for printing with UV inks and lacquers. The Uvitech project was supported within the framework of the European Commission development programme CRAFT. The project is coordinated by Envirocare. The industrial partners, printing firms and research institutes involved are included in the scheme below.



Since six printing firms are involved, the Uvitech project is divided accordingly into six sub-projects.

The Uvitech project officially began on 1 September 2001 and has a fixed length of two years.

### Background

There are many risks to be prevented:

1. Skin contact with UV inks, varnishes, and lacquers may cause skin irritation. In addition, polyfunctional acrylates may lead to sensitisation. For a sensitised person, further contact with the material concerned — even in very low doses — may cause a severe reaction with effects that are generally irreversible.
2. Inhalation of ink mist or inkfly (suspended ink particles) and uncured UV inks. In some circumstances, tiny ink particles may become airborne. The mist formed presents a hazard to inhalation and may be irritating to the skin and the respiratory tract.
3. Contact with wash-up solvents. This can result in dry skin, dermatitis, headaches, nausea, or effects which do not appear until much later. Some solvents also present a fire hazard. The effects depend on the type of solvent used.
4. Inhalation of ozone. Exposure to ozone gas can lead to eye, nose and throat irritation and even headaches or nausea. At even higher levels, chest pains and coughing may occur.
5. Exposure to UV light. Exposure to direct UV light may result in irritation of the eyes, conjunctivitis or deleterious effects to the skin. Skin reactions range from simple erythema to serious burns. Certain sensitive people may suffer retinal damage.
6. Exposure to electron beam energy can cause damage to the soft tissue and other organs.

### Aims of the action

This work has been endorsed by the Berufsgenossenschaften (BG) in Germany, the Caisse Nationale d'Assurance Maladie des Travailleurs Salariés (CNAMTS) in France, and the Health and Safety Executive (HSE) in the UK.

In the printing industry, where new UV technology may cause potential hazards, BG, HSE, and CNAMTS/CRAM are in agreement that a unified approach to this problem throughout Europe is the way to go.

These organisations are supporting this work contributing to European technological progress because:

- it adopts a unified approach to health and safety and the environment in UV printing across Europe;
- it will lead to improved standards of health and safety and working practices;
- it will increase knowledge of the recycling of UV printed paper waste;
- it will examine the parameters related to the fountain solution concentration with inkfly generation in the workplace.

It will give additional data related to volatile organic compounds (VOCs) and the emissions for a wide range of printing formulations.

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*The project gives a European view on the actual situation regarding handling and safety aspects of UV inks and varnishes in the European graphic industry and shows the strong similarity of the problems in the various European countries.  
(Luc Nuijten, UCB SA)*

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It will provide data on different printing machine performances related to health and safety exposures and environmental emissions.

Once the project is completed, it is planned that a major conference will be held for key players (approximately 50) from the world of OSH and printing and converting industries in their respective countries.

Seminars will be organised and hosted by BG, HSE and CNAMTS/CRAM in the respective countries for the relevant industries.

## Scope of the action

The intention is to look at the following phases in all printing firms in the course of the two years of the project.

### Phase 1

In phase 1, a stocktaking exercise regarding emissions is undertaken in all six printing firms. Possible emission sources such as noise, radiation, IPA, washing and cleaning agents, etc. will be recorded and quantified using measuring techniques, in normal practical conditions by Envirocare. At the same time, a fundamental study is being carried out by Fogra (Graphic Technology Research Association) on the effect of the composition of UV printing inks on the formation of ink particles in the air.

### Phase 2

The results obtained during phase 1 are used in the second stage of the project to study possible improvements in the printing process with UV inks and to test these in 'laboratory trials' at Fogra and/or the printing machinery manufacturers. The object of these trials is to find out the effects of the structure and the materials used in dampening and inking units (ink, dampening agents). Cooperation with the suppliers of inks, adhesives and photo-initiators should ensure that the best possible state-of-the-art technology can be used as a basis for printing inks.

### Phase 3

Implementation of the results obtained during phase 2 of the field trials in the corresponding printing firms. After a detailed evaluation of the results of these studies, the intention is to carry out a new assessment involving three printing inks under the best and worst test conditions in up to three of the SMEs (a commercially available UV printing ink, a new generation UV printing ink, and a traditional printing ink). On the basis of the results from these studies, it should be possible to draw up recommendations for improving the printing process.

Nationally and internationally recognised test methods will be used for occupational hygiene exposures relating to dust, inkfly, solvents, ozone, actinic UV, and spirometry measurements, as well as environmental emissions to atmosphere measurements involving particles, VOCs and ozone.

During the project, the SMEs will be kept informed of their individual results so that immediate action may be taken to remedy significant exposure levels, environmental emissions, or machine defects if necessary. They will also be informed of their performance in direct comparison with state-of-the-art printing machines.

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*The main risks identified, which were common to both conventional and UV printing, were associated with solvent vapour levels, noise and working practices allowed within the workplace, such as eating, drinking and smoking.*  
(Luc Nuijten, UCB SA)

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## Results

Once the results are known, a generic risk assessment and protocol will be drafted and published. This will give other SMEs in the printing industry a template on which to build their improvements.

This work would also assist governmental bodies with health and safety and environmental responsibilities in policing the printing industry more effectively.

Results and procedures and improved working practices for UV printing technology would be presented at printing machinery exhibitions, e.g. DRUPA (Germany), IPEX (UK), etc.

### *Provisional*

The interim report has been made available with the results from phase 1 and the partial results from phase 2. It should be stressed that these results are not final and that they could still change, as the project is still in progress and ends in October 2003.

### *Low inkfly risks*

The results from the interim report on the health and safety performance in the SME factories indicated that inkfly was not the major airborne hazard in the workplace. This is significant as it puts into perspective many of the preconceived ideas held and built up over the years within the printing industry relating to inkfly, compared with other potentially greater risks such as solvent exposure, poor working practices (e.g. use of PPE, eating, drinking, smoking in factory workplaces), and noise.

The results of tests of environmental emissions escaping into the atmosphere via local exhaust ventilation — fitted to UV printing machines primarily installed to remove ozone — showed that particle emissions were low and would not have an adverse environmental impact. Emissions of VOCs and ozone, however, were found to be significant and may have an adverse environmental impact relative to the EU's solvent emissions directive and air quality directive.

Although inkfly risks were judged to be low, the actual quantification of multifunctional acrylate exposure levels were indeterminate according to the analytical method used and require further work on this aspect.

### *Final report*

The final report is expected in October 2003. This will then be presented in the context of a European conference. Appropriate publications and information brochures will be drawn up to accompany this.

## General evaluation

The project is on schedule but still in the second phase. Therefore, it is too early for an evaluation. However, if all the aims and goals are achieved, the project will certainly have been a success.

## Identified success criteria

(1) Uvitech is a European project that has been:

- implemented in six SMEs in four different countries,
- endorsed by three different national health and safety institutes.

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*The aims are to determine the factors responsible for inkfly generation using high-quality measurements acceptable across Europe and provide expert guidance via pan-European generic risk assessment protocols and a major conference for the safe use of UV curing technology. (Luc Nuijten, UCB SA)*

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(2) This project is successful owing to its integrated approach to health and safety and environmental issues.

(3) The test methods used are nationally and internationally recognised.

## **Transferability**

### *Other industries*

The safe use of UV curing technology would also be of direct benefit to the wood, metal and plastic coating industries, where very similar problems are encountered.

### *Other countries*

As the project is taking place in six SMEs spread over four European countries, it is most likely that the process is transferable to SMEs in the printing industry, among others, in other countries.

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## Chemical and biological agents programme (Spain)



### Key points

- Company audits in order to reduce exposure to dangerous substances
- Training hygienists in prevention services
- Guide with the basic safety principles regarding dangerous substances available to the wider public via the Internet

### Introduction

In the framework of the chemical agents programme of 2002, the Instituto Navarro de Salud Laboral (INSL) developed several sub-programmes.

The case study has selected three of the actions that were executed in the framework of this action programme:

- Exposure to chemical agents
- Guidance on working conditions in relation to hygiene risks and the working environment
- Training and diffusion of information activities

#### *Company audits: exposure to chemical agents*

Companies reporting occupational diseases in 2000 and 2001 due to chemical substances, companies included in the DIANA programme, and construction enterprises concerned with the removal of asbestos were selected according to the established criteria to participate in the programme.

Between 1 January 2002 and 28 February 2003, the Institute visited 59 enterprises. Fifteen of these were visited on account of an occupational illness in the company due to exposure to dangerous substances. Forty-four companies were visited on account of risks that were observed during a preliminary visit in the framework of the DIANA programme.

During these company visits, the Institute tried to determine what the existing inadequacies were with regard to legal obligations. The management as well as the workers' representatives have been notified concerning these deficiencies.

Afterwards, the companies were visited for a second time and the improvements and degree of compliance to the shortcomings observed during

the first visit were evaluated. The companies received guidance concerning the shortcomings in terms of safety and health.

### *Training courses for hygienists*

The INSL organised a training course for hygienists in the prevention services. The course will be repeated several times. In 2002, it was directed towards union representatives.

Attention was not only paid to the legislation but also to the management of information, how to inform and give training on dangerous substances, the practical development of a policy, and good practices.

### *Guides and other documents*

The Instituto Nacional de Seguridad y Higiene en el Trabajo as well as the INSL developed practical guides on dangerous substances for public use. The guides can be downloaded freely from the Internet.

## **Background**

El Instituto Navarro de Salud Laboral and the Dirección is an autonomous body forming part of the health department. Their mission is to give technical advice on occupational safety and health. Their most important tasks are to promote the prevention of occupational risks and to provide technical advice, to undertake actions regarding occupational health, and to cooperate with the public administrations of Navarra in the prevention of occupational risks.

The law concerning the prevention of occupational risks (*Ley de Prevención de Riesgos Laborales*) and the Royal Decree on chemical agents with regard to hygiene risks (*Agentes Químicos respecto de los riesgos higiénicos debidos a contaminantes químicos*) aim to promote the improvement of working conditions and to increase the level of protection and health of workers. In these regulations, the various tasks of the public administrations and official health and safety institutes are stipulated. In this framework, the Instituto Navarro de Salud Laboral has to undertake actions to promote health and safety at work.

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*In 2002, a course on the hygiene risks due to exposure to chemical risks was organised for the hygienists of the internal and external prevention services. In 2003, the course was directed at the unions*

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*The basic guides are based on relevant and fundamental questions and make use of up-to-date information. They are illustrated and prepared in straightforward language and layout. The INSHT developed practical cards on specific themes to send to the city halls*

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### Aims of the action

The aim of the project was to improve the application of the law concerning occupational risks and the law on chemical agents regarding hygiene risks due to chemical pollutants.

- Development and start of a study related to the risks of biological agents in the framework of the sub-programme
- Promotion of the creation of an asbestos removal plan (conforming to the regulation in force), starting to remove the asbestos

### Scope of the action

The action was carried out by three partners: the Instituto Navarro de Salud Laboral, the Dirección General de Trabajo and the Inspección de Trabajo y Seguridad Social. Fifty-nine companies were audited. Informative cards were sent to inform city councils of the dangers of the construction industry.

### Results

#### *Exposure to dangerous substances*

During the visits, the institute concluded that:

- in 22 % of the enterprises, the occupational risks due to the presence of dangerous substances for the workers have not yet been assessed;
- 44 % of the companies included in this sub-programme have not succeeded in the basic principle of informing their workers about the existing risks of dangerous substances on the workplace. Only 26 % of the companies have informed their workers in writing about the results that were collected during the risk assessment.
- However, there was notable progress: most of the companies adopted corrective measures (94 %) but the number of companies who solved problems with individual protective clothing remained much higher (85 %) than the number of companies who took measures at the source (41 %).

Of the companies visited 61 % use chemical products that are classified as 'dangerous' according to the law. Half of these companies lack the legally prescribed safety card. This means that they are unaware of the risks and the prevention and protection measures recommended by their suppliers concerning proper use.

A total of 1500 informative cards were sent to municipalities and companies in the construction industry in order to inform them about the legal obligations concerning the abolition and removal of materials containing asbestos. The cards were accompanied by a practical guidance card on the content of a work plan for performing this kind of work.

In 2002, a course on the hygiene risks due to exposure to chemical risks was organised for the hygienists of the internal and external prevention services. In 2003, the course was directed at the unions.

### General evaluation

The success of the chemicals programme will be evaluated by the evolution of the occupational diseases caused by chemical agents in the companies participating in the programme and the number of work plans that can be

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*In 22 % of the enterprises, the occupational risks due to the presence of dangerous substances for the workers have not yet been assessed; only 26 % of the companies have informed their workers in writing about the results that were collected during the risk assessment*

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presented for removing asbestos. Since the project has not yet been finished, it is still too early to present the concrete results of the action.

However, the audits and re-audits indicate that the companies are making an effort to comply with the recommendations of the Institute and the authorities. The fact that the audited companies face penalties undoubtedly increases the willingness to comply with the recommendations.

The stakeholders did not evaluate the usefulness of the courses, brochures and texts that were available to the target audience. Whether or not the information available on the Internet has reached its target audience has not yet been checked and nor have the download statistics.

### Identified success criteria

The basic guides are based on relevant and fundamental questions and make use of up-to-date information. They are illustrated and prepared in straightforward language and layout. Furthermore, the Instituto Nacional de Seguridad y Higiene en el Trabajo developed practical cards on specific themes to send to the city halls. All this information is easy accessible via the Internet, where it can be freely downloaded.

The audits on the workplace were performed by official bodies. The results were communicated to the management of the company as well as to the prevention officers. There was a follow-up procedure that ensured that the given information was used and the shortcomings in the existing situations could be solved. Companies that did not solve the detected problems were reported to the inspectorate.

The possibility of a sanction urged the companies to pay attention to the advice of the experts performing the audit.

The project was supported and executed by three major partners (experts in this field).

The audited companies received guidance from the experts for improving their working conditions.

### Transferability

The information sources such as the manual on the handling of substances, including the references, are available on the web site of the Instituto Navarro de Salud Laboral and can be easily transferred to other countries and sectors, as long as the material is adapted to the legislative context of the specific sector or country.

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*However, the audits and re-audits indicate that the companies are making an effort to comply with the recommendations of the Institute and the authorities*

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*The audited companies received guidance from the experts for improving their working conditions*

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## A national network of asbestos information centres (France)



### Key points

- National network of asbestos information centres
- Information material in different forms (leaflets, videotapes, CD-ROMs) distributed from stands strategically placed in all regions of the country
- Seminars and information sessions conducted on a local basis

### Introduction

Towards the end of 1999, an initiative was undertaken by the National Fund for Illness Insurance of Employees — Occupational Risk Branch (CNAMTS) — in conjunction with the National Institute for Research and Safety (INRS), the Regional Health Insurance Funds (CRAM), and the Ministry of Labour together with other organisations <sup>(14)</sup> with the aim of creating a national network of centres against asbestos exposure. The networks' objective is to coordinate the dissemination of information on the risks associated with asbestos contact in maintenance and repairing of buildings, as required by national legislation (Section 3, Decree No 96-98, 7.2/96). The programme was conducted during the three-year period from 2000 to 2002. The aim of the project was promoted primarily from 72 information stands set up in all regions of France including the Outre-Mer areas (French overseas territories). These stands were administered by various organisations such as INRS, CRAM, the regional committees of the Professional Organisation for Prevention of Health Risks in Buildings and Public Works (OPPBTB), the medical services of the building sector, and other professional organisations.

<sup>(14)</sup> The partners involved in this campaign are the National Fund for Illness Insurance of Employees (CNAMTS), the National Institute for Research and Safety (INRS), the Regional Health Insurance Funds (CRAM), the Department of Work Relations in the Ministry of Labour and Solidarity, the Professional Organisation for the Prevention of Health Risks in Buildings and Public Works (OPPBTB), the Confederation of Tradesmen and Small Construction Enterprises (CAPEB), the French Construction Federation (FFB), the National Federation for Public Works (FNTP), the National Federation of Labour Cooperatives for Building and Public Works (FN/SCOP/BTP), and the National Trade Union for Protective Equipment and Materials (SYNAMAP).

## Background

As far back as 1995, INRS had already published reference material concerning the risks associated with asbestos exposure and related guidelines. In addition to this, CNAMTS issued from 1990 to 1998 a series of recommendations on asbestos exposure, treatment and disposal. OPP/BTP also published, in 1997 and 1998, guidelines for risk prevention on the same subject.

Work with asbestos can release small fibres into the air which, when breathed in, can lead to a number of fatal diseases such as lung cancer, fibrosis of the lung and mesothelioma. Usually there is a long delay between first exposure and the first symptoms of the disease. In recognition of the risks associated with asbestos, the European Union has passed legislation prohibiting its use. Most sufferers of asbestos-related diseases have worked in the building sector. They include construction workers, plumbers, electricians, carpenters, stokers, welders, joiners, mechanics, etc. The activities which these workers undertake involve cutting, sawing, piercing, drilling, demolishing and disposing of asbestos products such as corrugated sheets, gutters, rainwater pipes, water tanks, insulating boards, wall partitions and ducts, ceiling panels, etc.

## Aims of the action

The main objective of the action was to provide construction workers and craftsmen, engineers, occupational physicians and health inspectors with practical information for the maintenance and service of sites containing asbestos with the purpose of preventing fibre exposure. Information, depending on the depth of knowledge required, was provided through several means such as leaflets, posters, videotapes, a CD-ROM, lectures, seminars and apprenticeship programmes.

## Scope of the action

The action was designed to cover the construction industry in France and, in particular, to reach very small companies. The targeted groups in this sector included engineers, occupational physicians, health inspectors, technical students, and especially craftsmen and workers that are directly associated and therefore most likely to be exposed. It was decided to set up information stands in all regions of the country. There were two ways the information centres functioned. Stands were permanently placed where they could be attended by a large number of people. Other stands were staffed and easily transported to various events. Based on the number of visitors to each stand and the events organised, six regions (Aquitaine, Bourgogne-Franche-Comté, Île-de-France, Sud-Est, Pays de la Loire, and Alsace) were considered to be exemplary for the action (pilot regions).

Depending on local needs, the stands were put in places where those most concerned with these issues were likely to be found. Stands were usually moved to centres providing services in occupational health and at outlets (the so-called POINT P shops) for the purchase of construction materials for professionals and non-professionals. Other sites from which information could be obtained included CRAM or OPPBTP local offices, departments of the building federation, professional chambers, training centres, apprenticeship schools, etc. On rare occasions, stands were placed in exhibition centres, training centres for the construction sector, in a town hall and a hospital. Within the framework of the project, partnerships were organised in four regions between CNAMTS and POINT P shops, providing specific information.

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*This was a remarkable mobilisation campaign that reached individuals of all professions concerned with risks related to asbestos at work. The greatest difficulty encountered was reaching wage earners or isolated craftsmen, who are not aware of the risks associated with asbestos and who are not affiliated with organisations or federations. The originality of the campaign was its ability to relay information to even the less traditional situations. (Philippe Bourges, CNAMTS)*

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*The action was designed to cover the construction industry in France and, in particular, to reach very small companies. The targeted groups in this sector included engineers, occupational physicians, health inspectors, technical students, and especially craftsmen and workers that are directly associated and therefore most likely to be exposed*

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The manner and the degree to which information was disseminated from the stands was categorised as follows:

- On the stands, written documents were made available, diagrams and photographs were displayed, and personal protective equipment and tools were exhibited (information level 1).
- In a smaller number of stands, videotapes were also displayed (information level 2).
- In some cases, this information was provided by trained staff, appointed by the local centres (information level 3).
- Finally, in addition to this, promotion days, general meetings and training sessions were organised (information level 4).

Case seminars, apprenticeship courses, and one-day information sessions in professional chambers were also organised by CRAM.

### Problems encountered

The most important problem was reaching ordinary wage earners and traditional craftsmen. Another basic problem was the public's reluctance to accept that asbestos is still a problem today.

The information given varied greatly from region to region. In several places, the stands were primarily used for the dissemination of general information on asbestos risks and measures to be taken during work. Other stands provided technical information in greater depth. In some regions, it was difficult to manage the stands on a day-to-day basis.

In a few cases, the stands have remained at the same location from the beginning to the end of the action. For example, this occurred for stands at centres of occupational health, which are normally visited once or twice a year by employees, thus providing information to the same people each year. Nevertheless, the number of these visitors was calculated on a yearly basis.

To support the project, INRS printed 5 000 posters containing general information on asbestos. However, the distribution and placement of these proved a difficult task, especially in the initial phases of the action.

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*This action was conducted over a three-year period. During this period the 72 centres amounted to about 14 500 days of exposure to the public, with the number of visitors estimated at approximately 160 000. The information distributed was in the form of leaflets, pamphlets and the display of videotapes. Extra initiatives were taken, such as education sessions and seminars, promotion days, exhibitions for craftsmen and special topics days*

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### Results and evaluation of the action

This action was conducted over a three-year period. During this period the 72 centres amounted to about 14 500 days of exposure to the public, with the number of visitors estimated at approximately 160 000. In order to ascertain the success of the action, INRS sent a questionnaire in 2001 to all the stands. Of these, 80 % responded and the information obtained was used to evaluate the action during the first two years. On the basis of the answers obtained, only 15 centres provided their unequivocal support for the continuation of the action in the following year. During the last year only 20 stands of the initial 72 were still in operation and only 52 % responded to the same questionnaire.

The evaluation of the complete programme was published in April 2003. The information distributed was in the form of leaflets, pamphlets and the display of videotapes. Nevertheless, for the pilot regions, extra initiatives were taken, such as education sessions and seminars by CRAM, promotion days at POINT P shops, exhibitions for craftsmen, special topics days, etc. The local CRAM offices defined regional needs and dealt with them appropriately.

The dissemination of general information on measures to be taken on asbestos risks during work reached its height by the end of the first year. A general

observation was that there was a slowing down of pace and interest during the second year of the action. The videotapes were shown only at four centres, while one CD-ROM was used at one centre. Particularly interesting was the initiative of some regions to produce fact sheets with information of local interest, e.g. sites for the treatment and disposal of asbestos.

### Identified success criteria

A large number of organisations were involved in the creation of this network. The coordination of the technical aspects of the action at national level was performed by the national research institute INRS while the organisation at national level was performed by the Department for Occupational Risks (DRP) of CNAMTS. Major roles were played by the regional CRAM and the OPPBTP committees at local level. The role of the centres of occupational health in the dissemination of information on asbestos exposure cannot be overestimated. Of the various groups visiting these centres, a large percentage are solitary workers who do not have easy access to information on this matter. CRAM arranged the location of the stands in the POINT P shops thereby permitting individuals working in the construction sector — and not affiliated to any federation or professional organisation — to be reached.

The success of this action was guaranteed by the support received from all partners in publishing and distributing the basic leaflet on asbestos risks. INRS produced a poster on asbestos, OPPBTP and CRAM Bourgogne-Franche-Comté produced two videotapes while OPPBTP Aquitaine produced a CD-ROM.

### Transferability

This action could be transferable to other European countries if these have organisations willing to cooperate and build an information network on specific dangerous agents. The participation of local authorities and organisations is vital, first to define local needs and then to arrange management of the stands. Competent contact persons in each region are a prerequisite.

It should also be mentioned here that the questionnaires should bear in mind social and cultural factors. Equally important is the availability of sufficient resources to meet the development costs.

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*The National Network of Asbestos Information Centres is a communication enterprise on a large scale, which has reached a varied section of the population.*  
(Catherine Blotière, coordinator of Asbestos Information Centres, INRS)

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*This action could be transferable to other European countries if these have organisations willing to cooperate and build an information network on specific dangerous agents. The participation of local authorities and organisations is vital*

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## Strategy on the management of substances (SOMS): The experimental plots (Netherlands)

### Key points

- Pilot cases testing the new chemical policies at corporate level to incorporate the results and experiences of these cases in the new policy
- Identification of the risk category of certain substances via the Quick Scan
- Nine pilot cases: lubricants; benchmarking; professional clothing; the paper and cardboard industry; reuse of waste products in building materials; information management for chemicals at Philips; the soap industry; the national defence organisation; and the rubber and plastics sector
- Detection of 'gaps' in the provision of information all along the product chain
- Transfer of the experiences to policy-makers and the corporate level

### Introduction

As part of a new policy, the Dutch government published the memorandum 'Strategy on the management of substances' (SOMS). Targeted were all substances and every possible application of them. This memorandum was agreed upon in April 2001.

Within the framework of this SOMS strategy, the Dutch industry and government agreed to cooperate in the process of collecting and exchanging information.

In the context of the realisation of the SOMS programme, the government believed it was necessary to gain prior practical experience with the implementation of quality improvement and to test out the operationalisation of the product chain responsibility concept. Therefore, it set up pilot projects termed 'experimental plots' or 'test gardens'. These plots would test the implementation of the new policies at corporate level. The government then launched a call for proposals.

In 2002, nine pilot cases were developed by different groups of organisations:

- lubricants;
- benchmarking;
- professional clothing;
- the paper and cardboard industry;
- reuse of waste products in building materials;
- information management for chemicals (Philips);
- the soap industry;
- the national defence organisation; and
- the rubber and plastics sector.

Plots selected were subsidised (50 %) by the government.

The action was initiated by the Dutch government in May 2002 and will continue at least until the summer of 2003. The projects were launched in August 2002 to last until August 2003.

## Background

For many substances, no information is available on whether they may cause damage to health and the environment. In the Netherlands, awareness of this resulted in a new chemicals policy and strategy initiated in 1999: the SOMS policy. It was presented within the regulatory framework of European policy. This policy brought together representatives from the environmental movement, labour organisations and the corporate world and is an integral approach to the management of substances (environment, people's health, and worker protection).

## Aims of the action

The objective of the experimental plots is twofold. On the one hand, they are intended to give companies the opportunity to experiment with the new instruments, learn from them, find solutions, and share their experiences with all the relevant parties. The government feels that the 'test gardens' could improve the involvement of companies in the policy innovation process. In addition, the government would like to incorporate the results and experiences of these plots in the new policy.

On the other hand, the project is aimed at informing the EU of the existence and possibilities of the Dutch SOMS approach and to influence in a positive way the dangerous substances' policies at European level.

During this initial stage, the aim is to evaluate what information is available, the quality of the information, and its intelligibility.

## Scope of the action

The experimental plots are set up in a corporate environment in association with several partners at corporate, supply-chain and sector level.

The potential application field of the plot results, whether a system, a method or a set of learning experiences, has to go beyond the participating companies. The partners have to guarantee the dissemination of the test case results. The financial support comes from the government and the project partners.

## Problems encountered

The problems are diverse and depend on the objectives of the projects.

Foreign companies included in the projects consider the SOMS policy in advance of developments in Europe. Companies outside the Netherlands are often rather reticent to help with the Quick Scan method <sup>(15)</sup>.

## Results

Liaising with the core business of the companies and sectors is one of the things that work well. Companies and sectors request an integral approach. A good start has been made and there is motivation for working together.

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*Openness with regard to the partners in the product chain is crucial for the project to succeed and leaves room for communication between all the links in the chain. Trust in the expertise and commitment of the partners motivates them to invest fully in this project.*  
(Leoniek van der Vliet, Ministry of Social Affairs (SZW))

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<sup>(15)</sup> For more details, see the two experimental plots described below.

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*A distinction has been made between a national and a European section. The European section attempts to work with REACH and the White Paper and to introduce the Dutch opinion into the EU discussion. The national section is directed towards the chain approach, sectors and companies*

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*The safety data sheet (SDS) seemed to be the most important source of information on dangerous substances for workers. However, the quality of these sheets is not always comparable. In most cases, unfortunately, a great deal of information needed to estimate the hazards of each component is lacking*

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*Connecting with the core business of the companies and sectors is one of the things that work well. Solutions cannot be generalised and have to be fine-tuned to the sectors and their specific problems. There is a strong call from companies and sectors for an integral approach. It is impossible to get the different political domains and responsibilities in line with each other from one day to another but a good start has been made and there is keenness to work together.*  
(Leoniek van der Vliet, Ministry of Social Affairs (SZW))

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*Several European countries are confronted with the same challenge of setting up a new chemicals policy and will have to deal with similar problems and challenges*

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Thanks to the feedback from the participants of the experimental plots, the SOMS policy has been able to be adapted.

A distinction has been made between a national and a European section. The European section attempts to work with REACH and the White Paper and to introduce the Dutch opinion into the EU discussion. This is the task of the Ministry of Spatial Planning, Environment and Housing (VROM).

The national section is directed towards the chain approach, sectors and companies, and is organised by the Department of Social Affairs and Employment (SWZ) and the Department of Health, Welfare and Sport (VWS). Collaboration between the departments is being progressively fine-tuned and extended.

The safety data sheet (SDS) seemed to be the most important source of information on dangerous substances for workers. However, the quality of these sheets is not always comparable. If correctly filled in, the SDSs can be used to properly inform workers of the risks associated with the substances. In most cases, unfortunately, a great deal of information needed to estimate the hazards of each component is lacking.

### General evaluation and effectiveness

It is vital that the information systems are geared to one another in order to make the information transferable. The collection and the interpretation of the data were necessary to estimate the risks and to provide understandable information. The results of the project will be presented during a final workshop.

### Identified success criteria

The whole of industry was involved in the project. Enterprises from different sectors were contracted to test out the new policy. This was necessary to ensure a broad and versatile platform. It was not the first time that an experimental plot had been set up. In 1998/99, the Institute for Inland Water Management and Wastewater Treatment developed a processing matrix for the tanker cleaning industry. A substances database was created as part of this project. Several partners worked together to manage and update this database. These experiences were used to develop the experimental plots.

The SOMS project is supported by the government and is issued within a specific legislative framework and strategy. Some of the funding was provided by the government. Several phases to evaluate the progress of the project are planned. The government regularly publishes progress reports, in which the progress of the entire SOMS strategy is evaluated. The 'test garden' project is currently being evaluated by an external research company.

### Transferability

Several European countries are confronted with the same challenge of setting up a new chemicals policy and will have to deal with similar problems and challenges.

Since the Dutch government wants to conform to the chemicals policy in the European legislation and because many of the companies use products coming from internationally based companies — or are internationally based

companies themselves — the experiences of the experimental plots will be useful to other companies and governments searching for ways to shape their chemicals policy.

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## Details of two experimental plots

### Plot 1: Lubricants

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research and consultancy on sustainability



#### Introduction

When exchanging information along the supply chain, it is important to recognise the differences in the need for (and content of) information at every part of the chain. In this pilot project, the different parts of the chain (from manufacturer to end user) are present and cooperate on improving the exchange of information. The project partners identify gaps in knowledge, generate the necessary information, and try to find solutions for the problem of product confidentiality. This experimental plot was requested by a supplier company (Shell Netherlands) and an NGO (Stichting Natuur en Milieu) active in the protection of the environment. The project lasted from 1 August 2002 until 31 July 2003.

#### Background

In the context of the realisation of the SOMS programme, the government wanted to gain prior practical experience with the implementation of quality improvement and to test out the product chain responsibility concept.

#### Aims of the action

- To improve the quality of the information supply in companies and specifically with regard to the production chain
- To collect information on substances according to categories of concern and the measures that have to be undertaken as a consequence
- To provide information to the rest of the product chain
- To provide information to third parties

In this pilot project, the focus was on gathering information on environmental and occupational health risks of lubricants, to identify (and if applicable to fill in) the gaps in the knowledge on substance data and to optimise the information for all the links in the production chain, from manufacturer to end user. Central to the project is the provision of information all along the product chain. Therefore, the flow of information throughout the product chain was analysed.

#### Scope of the action

##### *Partners*

In this plot, partnership at all levels is ensured. Every link of the 'lubricants' product chain, from manufacturer to end user, is implicated in the plot:

manufacturers of raw materials, manufacturers of lubricants, an original equipment manufacturer, users, a trade union, an environmental NGO, a knowledge provider, etc.

The government — and the Dutch sector organisation for lubricant suppliers — provides advice via the steering committees of the experimental plot. IVAM, a research and consultancy bureau, coordinates the actual process and supervises the content and progress of the project.

*Targeted level and group*

The partners mentioned above were needed to ensure that the right kind of information and feedback was provided for every level of the process. Directly targeted groups of the plot are the users (employers, employees and manufacturers) and the national government.

*Method*

Regarding the collection of information, for every link in the chain it was identified what information was missing, what data were already known and to whom they had been provided, and what methods could be used to collect these data. A plan was drawn up for collecting and generating the rest of these data. The collection of the missing substances data was executed using the Quick Scan method developed by the government, providing a quick identification of the risks and characteristics of substances.

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*Every link of the 'lubricants' product chain, from manufacturer to end user, is implicated in the plot: manufacturers of raw materials, manufacturers of lubricants, an original equipment manufacturer, users, a trade union, an environmental NGO, a knowledge provider, etc. The government provides advice via the steering committees of the experimental plot*

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*The chemical policy of the Dutch government distinguished itself by developing a Quick Scan method that gives priority to substances that need to be assessed the most urgently (Pieter van Broekhuizen, Manager Chemical Risks, project coordinator, IVAM)*

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Primary questions that were asked were:

- Which substances are used in (a selection of key) lubricants?
- What information is missing in the environmental and toxicity data?
- Which category of concern should be attributed to the substances of concern and consequently to the selected lubricant products?
- What information is needed (and understood) regarding the substances and products used?
- Which problems are encountered when optimising the flow of information along the production chain?
- Which possibilities exist to optimise this flow of information along the chain?

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*Most of the time, the information concerning the exact composition of the products is confidential. Producers/formulators generally prefer to keep the compositions of their products a secret to avoid other companies "stealing" their knowledge (Pieter van Broekhuizen, Manager Chemical Risks, project coordinator, IVAM)*

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*Knowledge about the used substances in a product is usually limited to one department in the company (the R & D department). This implies that even mechanics and product stewards in the company do not have access to the specific information regarding the composition of the products*

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*The manufacturer of lubricants is usually aware of which substances he can combine but it can happen that he is unaware of the exact chemical composition of the additive package he buys (Pieter van Broekhuizen, Manager Chemical Risks, project coordinator, IVAM)*

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*The research and development departments of the multinational manufacturers are generally situated abroad. Since the official SOMS documents were initially only available in Dutch, this complicated communication regarding the project*

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Steps that were undertaken were:

- collection of the information concerning lubricants (Quick Scan);
- identification of existing information in the chain;
- discussion about and search for solutions to confidentiality problems;
- optimising and use of the flow of information;
- conclusions.

### *Problems during the action implementation*

#### (1) Confidentiality

(a) Most of the time, the information concerning the exact composition of the products is confidential. Even the manufacturer of the lubricants is in some cases unaware of the composition of the additives he buys.

(b) Another problem concerning the confidentiality of the data is the fact that a company could have determined the toxicity of the substances through expensive research but wants to keep this information confidential to avoid competitors using it.

#### (2) Reliability

A second problem is the reliability of the data. Data provided by the manufacturer of the raw materials (or lubricants) are sometimes incorrectly filled in or incomplete and these mistakes can be transferred along the chain.

#### (3) Clarity

A third problem is the clarity of the information provided. The SDSs play a key role in the information process. For laymen they provide information about the substances, which is only functional for a limited part of the safety policy in companies and only if the matter is thoroughly understood.

Knowledge about the used substances in a product is usually limited to one department in the company (the R & D department). This implies that even mechanics and product stewards in the company do not have access to the specific information regarding the composition of the products.

The research and development departments of the multinational manufacturers are generally situated abroad. Since the official SOMS documents were initially only available in Dutch, this complicated communication regarding the project. Communication improved once the documents regarding SOMS and the Quick Scan were translated into English. This caused some delay in the development of the project. The solution is that every document is immediately available in English.

The collaboration of multinational manufacturers to the Dutch policies that are of interest to the importers is hindered by European developments regarding the White Paper and the REACH system. Sometimes manufacturers prefer not to provide the data needed for the SOMS programme but to wait for further European developments on this matter. They choose to comply with European legislation rather than with the national rules.

The project partners encountered great difficulties using the Quick Scan method. The most important reason is that a lot of very specialised knowledge (environmental chemistry and toxicological knowledge) is needed.

However, they decided upon the criteria for determining the category of concern that substances require. A few questions arose about the practical development. There were a few points that stayed rather vague in the official documents of the government. To partially solve this problem, IVAM has developed the concern categories for two substances and passed it on to the partners.

## Results and general evaluation

IVAM has stated that in the first stage, there has been noticeable progress in the collection of information and that the partners have been cooperative.

In a further stage, there were some problems in collecting the data.

The transfer of the information was delayed because of the fact that the documents were not available in English at first. The use of the Quick Scan needed more specific (applied scientific) assistance than had been planned and the determination of the concern categories takes more time than expected. As a consequence of the delays and difficulties, the amount of lubricants that will be evaluated is decreased.

Workshops were used for the exchange of information and feedback from the partners. At the end of the project, two workshops will be organised to inform workers who are members of the FNV Bondgenoten trade union of the results of the project and to give feedback on the results.

## Success criteria

A broad platform should ensure a wide consensus on the needs of the different links of the production chain. For every link in the chain, for every level of information, and for every stage in the project, participation of different partners is guaranteed. This is useful for obtaining a wide-ranging view on experiences regarding the provision of information on lubricants.

Several information phases are planned during the process, in which the feedback of the different partners will be shared and commented on.

The media will be used to disseminate the information. The results will be communicated via sector periodicals and several environmental and occupational health and safety magazines and a mini-conference.

The Quick Scan method of the government was used to determine which hazards the substances represent and what data are lacking. This facilitated the process of data gathering and prioritising.

The ease of understanding and clarity of the communicated information to the workers.

The project starts with a bottom-up approach and examines the needs at the workplace in order to set up the system.

The project is partly based on the experiences and data of a formerly successful developed European project LLINCWA.

## Transferability

The methodology of enlisting and analysing data throughout the entire production chain is not only applicable to the lubricant sector but also to other sectors. Plans exist to transfer this case to a European context. The project is

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*The collaboration of multinational manufacturers in the Dutch policies that are of interest to the importers may be frustrated by European developments concerning the White Paper and the REACH system. Sometimes the choice is made not to provide the data needed for the Dutch SOMS programme but to wait until further European developments are announced. Their policy in general is to conform to European legislation rather than to the (different) national approaches*  
(Pieter van Broekhuizen, Manager Chemical Risks, project coordinator, IVAM)

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*A broad platform should ensure a wide consensus on the needs of the different links of the production chain. For every link in the chain, for every level of information, and for every stage in the project, participation of different partners is useful for obtaining a wide-ranging view on experiences regarding the provision of information*

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*The project starts with a bottom-up approach and examines the needs at the workplace in order to set up the system*

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based on European and international data (for example, EINECS) and European legislation, and partly on the findings of the European project on lubricants in inland and coastal water activities.

The transferability of the information gathered via the Quick Scan is being studied to be used within the framework of the REACH system, a system that the EU is developing in the framework of its White Paper.

### **Contact information**

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## Plot 2: Benchmark project on chemical management/information system

Period: 26 July 2002 to 25 July 2003

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### Introduction

This experimental plot was requested by NAM (Nederlandse Aardolie Maatschappij), a producer of mineral oil and natural gas. A wide range of chemicals is used in the execution of their activities. It is important that these chemicals are well managed at every stage of their lifecycle, in order to keep the risks and harmful effects to the safety and health of the workers and the environment to a minimum.

The action is a good example of how to gather valuable information and to transfer it to a target audience. The first step is the identification of the existing information processes and the actual method of transferring the information that is under scrutiny. Improving the provision of information will be a second step.

Initial questions asked:

- What is the basic information needed to assess and manage the risks?
- What happens with this information?
- How is the information interpreted and stored?
- How is the information transferred to the user?

In order to identify and investigate the various lifecycle elements, the required properties of chemical substances for risk management, and the available information and information systems, eight companies agreed to participate.

### Background

In the context of the realisation of the SOMS programme, the government sought to gain prior practical experience with the implementation of quality improvement and to test out the product chain responsibility concept.

### Aims of the action

The aim is to improve the chemicals management system in companies handling chemicals in order to support safe handling of substances at every stage of the lifecycle, and to minimise the health and safety risks for workers.

Preliminary steps and aims are:

- carrying out benchmarking regarding the management systems of chemicals;
- identifying best practices concerning chemical management systems;
- improving the NAM management system, based on the knowledge, experiences and results of the benchmark research. The focus is on improving the management and information system as well as improving the information transfer to the workplace;
- communicating the available knowledge and experiences and the results of the benchmarking research.

Questions that have to be answered are:

- What information is necessary?
- In what way is this information used in the lifecycle and during the implementation of measures?
- How can we effectively transfer relevant and up-to-date information to the workplace level?

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*The intention is to inform workers about the substances, the safety and health and environmental aspects and the preventive measures to be taken. Recommendations for the improvement of the management and information system of chemical substances is directed towards employers and OSH/environmental professionals*

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*Eight companies, each having an operational management system of chemicals, were asked to participate in the project. The participating companies are requested to complete a questionnaire about the design and content of their information system concerning chemical substances, the characteristics of the management system of chemicals, the information that is stored in the system, and the kind of information available to users*

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### Scope

#### *Targeted level and groups*

The level targeted is the corporate level within and outside this sector. The intention is to inform workers about the characteristics of the handled substances, the safety and health and environmental aspects that are relevant, and the preventive measures to be taken. Recommendations for the improvement of the management and information system of chemical substances is directed towards employers and OSH/environmental professionals.

#### *Partners involved*

No direct project partners were contracted. Eight companies, each having an operational management system of chemicals, were asked to participate in the project.

The workers are informed through the use of the 'Workfloor instruction cards' on the NAM intranet. Feedback is collected and observations are used to improve the system.

A software company provides support for the database.

In order to ensure a wide dissemination of the results, several companies are involved. Other collaborators are representatives of the Dutch authorities, hospitals, other oil and gas companies, etc.

#### *Approach*

A number of companies were approached to participate in the benchmark research. The participating companies are requested to complete a questionnaire about the design and content of their information system concerning chemical substances, the characteristics of the management system of chemicals, the information that is stored in the system, and the kind of

information available to users. Best practices will be identified and implemented in the NAM chemical management system. The knowledge, experiences and results will be presented in publications and presentations.

### Means

The basis is the Chemics+ information system that NAM developed a few years ago. The system provides chemical information but is also used to register chemicals used in NAM. Only chemicals that are registered may be acquired, used, stored and transported. This database provides workflow instruction cards with information for workers on the risks of substances and preventive measures to be taken. Cards are generated in different languages for six different exposure categories (indoors/outdoors for closed systems, contact with product and mist/dust formation). The product card presents additional product information. The database details the composition of the product, relevant MAC values (OEL), labelling, physical and chemical properties, relevant transport information, etc. Many of the SOMS criteria are already incorporated into the system although not to a sufficient level.




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*Research shows that the VIB (Veiligheidsinformatieblad or SDS) is an important point of departure. A few of the participating companies always ask for the composition of the product. Other participants do not request this in every case. Obtaining the complete composition and all relevant properties and hazards of the individual substances incorporated in the product is very time-consuming and laborious work (Aad van Dijk, Senior Consultant, Production Chemistry)*

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### Problems encountered

Suppliers are not always prepared to provide information about the complete composition of the product (proprietary information). Obtaining complete and correct information on chemicals and all its components proves to be a cumbersome and time-consuming process.

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*Obtaining complete and correct information on chemicals and all its components proves to be a cumbersome and time-consuming process*

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### Results and evaluation

While writing this document, the final results were not yet available. However, some interesting observations were made by the project coordinator.

- From the research in the participating companies it appeared that the safety data sheet is an important point of departure for most information systems. Some companies always ask for the complete composition of the product. Other companies do not always ask.

- The information on dangerous substances present in the management system of the chemicals is used during several steps of the lifecycle of the products. Exactly when it is used depends on the underlying philosophy of the system.
- It appears that the chemical management systems of the participating companies differ in their design and objectives.
- Most participants have managed the lifecycle of dangerous substances in the company well.

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*The action is based on a tool (Chemics+) that was already well developed and implemented in a number of companies. They had previous experience with the method of data collection for this type of project*

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*Responsibility throughout the product chain is taken seriously by most of the participating companies. It appears that the term is not always known but that companies spontaneously act in accordance with the concept. Most of the time, the responsibility throughout the chain stems from a general feeling of responsibility (Aad van Dijk, Senior Consultant, Production Chemistry)*

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### Success criteria

The action is based on a tool (Chemics+) that was already well developed and implemented in NAM and a number of other companies. They had previous experience with the method of data collection for this type of project.

The participating companies are requested to complete a questionnaire on the management system of chemical substances in their company. After that, results were discussed with the consultants.

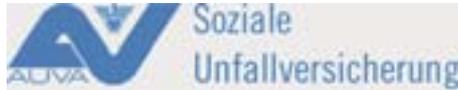
### Transferability

Since a lot of companies deal with dangerous substances and every employer has to inform his employees about the risks and prevention measures for dangerous substances, this information and the actualisation of the data is crucial to workers. The substances inventoried in the database are not limited to the oil and gas sector. Neither the methods used to collect knowledge on how relevant information regarding dangerous substances should be acquired nor those on how to update the management system of chemical substances are limited to the oil and gas sector.

### Contact information

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## Safety and health strategy against biohazards (Austria)



### Key points

- Strategy for selected sectors involving biological risks
- Risk assessment including in-depth analysis
- Awareness building, public activities and solution providing

### Introduction

Many European countries including Austria issued in the late 1990s regulations to protect workers against biohazards. These regulations transposed and adopted the European directives on biological agents <sup>(16)</sup>. The framework law, the *ArbeitnehmerInnenschutzgesetz* of 1995 implementing Council Directive 89/391/EEC of 12 June 1989 on the introduction of measures to encourage improvements in the safety and health of workers already defined certain biological agents as dangerous agents (Article 40).

In comparison to other risks the awareness concerning biological risks in certain sectors was seen as too low, the control instruments were not on the whole well developed, and good solutions were sometimes missing or not common practice. To support improvement in these sectors, Austria conducted a systematic national strategy covering: analysis of the status quo, development of good solutions, awareness-raising, and promotion and dissemination of good solutions. The Austrian Social Insurance for Occupational Risks (AUVA) and the Central Labour Inspectorate (Zentral-Arbeitsinspektorat) coordinated the strategy and the public activities.

### Background

The risk of occupational exposure to biological agents or micro-organisms is quite dispersed. Exposure is common and has already been regulated for longer in some highly exposed working areas where these hazards have been

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*In comparison to other risks the awareness concerning biological risks in certain sectors was too low, the control instruments were not well developed, and good solutions were sometimes missing or not common practice. To support improvement in these sectors, Austria conducted a systematic national strategy covering: analysis of the status quo, development of good solutions, awareness-raising, and promotion and dissemination of good solutions*

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*In some highly exposed working areas these hazards have been recognised as major risks. These include hospitals, where the workforce has a high infection risk, or farm work, where specific allergic reactions against, for example, grain dust are a widely known occupational disease*

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<sup>(16)</sup> Council Directive 90/679/EEC of 26 November 1990 on the protection of workers from risks related to exposure to biological agents at work (seventh individual directive within the meaning of Article 16(1) of Directive 89/391/EEC (OJ L 374, p. 1), as amended by Council Directive 93/88/EEC of 12 October 1993 (OJ L 268, p. 71), as amended by Commission Directives 95/30/EC of 30 June 1995 (OJ L 155, p. 41), 97/59/EC of 7 October 1997 (OJ L 282, p. 33) and 97/65/EC of 26 November 1997 (OJ No L 335, p. 17).

*Traditionally, water-based processes in industry — such as work with cutting fluids, in the pulp and paper industry, or in façade cleaning with water, etc. — also carry biological risks. In other sectors, such as work with waste or wastewater or work in archives, the risks were not well recognised. The growing recycling industry put biohazards on the agenda in the waste sector*

*The growing amount of air-conditioning systems causes growing risks of exposure to biohazards for maintenance personnel and for industrial and office workers in air-conditioned rooms*

recognised as major risks. These include hospitals, where the workforce has a high infection risk, or farm work, where specific allergic reactions against, for example, grain dust are a widely known occupational disease.

Traditionally, water-based processes in industry — such as work with cutting fluids, in the pulp and paper industry, or in façade cleaning with water, etc. — also carry biological risks. In other sectors, such as work with waste or wastewater or work in archives, the risks were not well recognised and the regulations were not specific.

In addition, the growing recycling industry put biohazards on the agenda in the waste sector. New risks of infection (e.g. HIV) had to be dealt with and public scandals such as BSE brought biological risks again into the mind of the general public.

Other factors also contributed to a higher awareness. For example, the growing amount of air-conditioning systems causes growing risks of exposure to biohazards for maintenance personnel and for industrial and office workers in air-conditioned rooms.

'Biological agents' refers mainly to three groups of micro-organisms: bacteria, fungi (yeasts, moulds, etc.) and viruses. Biological agents in the sense of Directive 2000/54/EC on the protection of workers from risks related to exposure to biological agents at work also include genetically modified micro-organisms, cell cultures and human endoparasites.

Biological agents shall be classified into four risk groups according to their level of risk or infection emanating from them.

- Risk group 1: Biological agents which are unlikely to cause human disease
- Risk group 2: Biological agents which are unlikely to cause human disease and may be a hazard for workers; they are unlikely to spread to the community; there is usually effective prophylaxis or treatment available
- Risk group 3: Biological agents which may cause severe human disease and are a serious hazard to workers; they may present a risk of spreading to the community but there is usually effective prophylaxis or treatment available
- Risk group 4: Biological agents which cause severe human disease and are a serious hazard to workers; they may present a high risk of spreading to the community; there is usually no effective prophylaxis or treatment available

For example, the classification of some well known viruses shown in the table below.

Organism	Risk group 1	Risk group 2	Risk group 3	Risk group 4
Viruses	Life-attenuated vaccines	Rabies virus	Hepatitis B virus Herpes B virus HIV virus Yellow fever virus	Lassa virus Agent of smallpox

The safety levels of preventive and control measures depend largely on the risk groups.

## Aims of the action

The goal of the activities was to better define the risks, to raise the general awareness of companies, to find appropriate solutions, and to facilitate and support the work of the OSH personnel within the companies and inspectors.

The main target groups were the employers and employees and the OSH personnel in these sectors.

## Scope of the action

### Definition phase

The AUVA and the Central Labour Inspectorate started their focused activities after the new national regulation entered into force in 1998 (*Verordnung biologische Arbeitsstoffe* — VbA). The first step was a better analysis of the status quo of the risks in certain sectors.

The selection of the sectors studied was made according to the following criteria:

- number of employees concerned,
- kind of risks,
- exposure and measurement,
- disease rates,
- minimisation of risk.

According to the regulation, those types of work which can be defined as intentional handling of biological agents are covered by the regulation. This means work with sick persons, sick animals, or continuous work with plants. The regulation can also be applied if there is a certain risk due to unintentional exposure to biohazards. Not covered are certain occupations with regular work in groups (e.g. teachers) or contact with many people (e.g. bus drivers, cashiers, etc.).

The organisers selected seven areas for their campaign:

- food production,
- agriculture,
- laboratories,
- hospitals,
- archives/libraries,
- work with waste and
- wastewater.

The approach was consistent in all these areas. It started with an analysis of the status quo including expert analysis and laboratory measurements of the type and quantity of biohazards such as fungi, bacteria, parasites and viruses in the working environment. The next step was the development and dissemination of good practice solutions.

Three working areas will be described in this case study in more detail: collection and transport of waste from households, working within sewage systems, and work in archives and libraries.

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*The risk of biohazards requires continuous activity because it is a permanent risk for certain sectors and enterprises. The public activities have had a good start*  
(Manfred Hinker, AUVA)

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*The approach was consistent in all these areas. It started with an analysis of the status quo including expert analysis and laboratory measurements of the type and quantity of biohazards such as fungi, bacteria, parasites and viruses in the working environment. The next step was the development and dissemination of good practice solutions*

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### *Solutions and recommendations*

For all working areas, a number of general protection and hygiene measures were recommended:

- technical measures such as avoidance of spraying technologies;
- reducing the number of exposed employees as far as possible;
- yearly instruction;
- no drinking, eating and smoking with contaminated clothes, hands or directly within the workplace, and separate storage of food;
- provision and use of personal protective equipment (PPE);
- immediate cleaning and treatment of small wounds to the skin, skin protection;
- yearly instruction on risks and control measures;
- the employer has to provide a plan for skin protection and hygiene;
- in certain cases, annual medical examinations provided by the employer.

### *Organisation*

The whole initiative consisted of a number of focused projects under the umbrella 'biohazards'. It resulted in a number of detailed information leaflets for the enterprises. The results of all studies were presented at a conference. Practical sheets were produced to inform the workers and employers.

### **Problems encountered**

The term 'biological hazards' is very broad. A better definition could perhaps help to raise the awareness of risks. One suggestion is to use the definition 'exposure to biological agents'.

### **Results and evaluation of the action**

A systematic evaluation of improvements is difficult. The focused activities only began three years ago. A reduction of diseases due to biological hazards cannot be measured in such a short time.

The results were presented at a workshop ('Biological agents in Austria — A major risk?').

Leaflets for certain working areas were developed.

Many changes have been made; for example, companies have introduced better ventilation systems. In general, the knowledge on biological agents and the risks connected with certain occupations has been broadened. Many results have also been sector specific.

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*Working area: collection and transport of waste from households*

The main risk from biohazards in this occupation was due to the oral uptake of fungi and micro-organisms. The bacteria and fungi detected in the laboratory studies belonged mainly to risk groups 1, and in a few cases to group 2.

The main risk is due to the exposure to fungi in the air when loading and unloading the waste containers. The amount of fungi depended mainly on the number of days between the disposal days. Rhythms of two weeks caused higher amounts of micro-organisms than seven-day rhythms. Naturally, the number of fungi was much higher in the summertime.

The proposals for protective measures were:

- daily cleansing of the cabin;
- high pressure cleaning of the loading area of the refuse collection vehicle (breathing protection);
- possibility to avoid contamination of the cabin (closed windows, also in the summer period, i.e. air conditioning), filtering of the air;
- vaccination against Diphtheria, Tetanus, Poliomyelitis and Hepatitis A and B.

*Working area: sewage*

Untreated or raw sewage is mainly water containing excrement, industrial effluence and debris (i.e. sanitary towels, condoms, plastic, etc.). Excrement is the major source of harmful micro-organisms, including bacteria, viruses and parasites.

The risk groups found by the Austrian scientific institute for bacteria and viruses were mainly 2 and in a few cases 3. Bacteria and viruses of risk group 3 such as Anthrax or Hepatitis C were found in wastewater. For fungi, group 1 (and in a few cases group 2) was the dominating risk group.

The risk stems mainly from contact via small wounds or accidental ingestion. The number and type of micro-organisms and the hazards are serious. Risk through inhalation was measured but seen as negligible.

Proposals for protective measures include:

- very good hygiene including all the necessary equipment. This includes separation of contaminated and clean areas;
- effective personal protective equipment;
- no working with small wounds;
- technical improvements such as better ventilation, automatisisation of cleaning process, no turbulences during work.

*Working area: archives and libraries*

Archives have until now not been the focus of prevention against biohazards. However, it seems comprehensible that in archives with high moisture levels and documents with a long storage time, the number of fungi can be very high. This was precisely the case in the studied archive. Fungi such as *Aspergillus* and *Penicillium* were found in high amounts.

Protection measures recommended included:

- disinfection of surfaces;
- special clothing, such as caps;
- protection of the skin;
- breathing protection in very contaminated rooms;

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*Issuing of regulations concerning biological hazards was one step in a risk-reduction process and apparently not enough to make better workers' protection a reality. The enterprises or sectors addressed needed clarification on whether they were concerned or not and how high the risk might be. The risk assessment, including the measurements in the first phase, provided such a clarification*

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- no potted plants in the working rooms;
- regular cleaning of reusable clothing;
- strict separation of working and eating areas;
- monitoring;
- one-way paper towels for cleaning purposes.

As long-term preventive measures, better control of the moisture, regular cleaning and cooling in summer were recommended.

### Identified success criteria

Issuing of regulations concerning biological hazards was one step in a risk-reduction process and apparently not enough to make better workers' protection a reality. There seemed to be a certain level of discontent with the low awareness and the absence of practically applied regulations in some sectors. The activities of the State authorities obviously met certain needs in these sectors.

The enterprises or sectors addressed needed clarification on whether they were concerned or not and how high the risk might be. The risk assessment, including the measurements in the first phase, provided such a clarification.

The public activities contributed to a higher awareness in all enterprises concerned. This showed to the public that the general approach was more than just regulatory.

The developed flyers and practical solutions completed the picture. Information and practical support were combined in the strategy.

Some of the results were also presented at the enterprise level with an opportunity to reflect upon necessary control measures and the aim to provide direct feedback to the workers and employers concerned.

### Transferability

The strategic approach and the results can be transferred to other countries. The risks of biohazards and the work environment in certain occupations will be very similar in all EU Member States.

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*The strategic approach and the results can be transferred to other countries. The risks of biohazards and the work environment in certain occupations will be very similar in all EU Member States*

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## COSHH Essentials and e-COSHH (United Kingdom)



### Key points

- Easy-to-understand tool to help companies assess and manage the risks from harmful chemicals
- Individual risk assessment combined with practical solutions
- Very successful — High interest from other Member States
- Electronic version even more successful

### Introduction

There are approximately 1.3 million firms in the United Kingdom using chemicals. Compliance with fairly complex duties and regulations concerning chemicals is a common problem for enterprises. In the UK the 'Control of substances hazardous to health regulations' (COSHH) requires that wherever there is potential for exposure to hazardous substances during work, a suitable and sufficient assessment of the risks is completed and the necessary precautions are taken before the work is carried out.

COSHH Essentials is a tool — essentially a guide — developed by the UK Health and Safety Executive (HSE). In 1999, HSE provided a paper-based support tool ('COSHH Essentials') and a web-based tool in 2002 ('Electronic COSHH Essentials') to help firms comply with the COSHH Regulations.

### Background

COSHH regulations governing the use of hazardous chemicals came into force in October 1989. The COSHH regulations were revised in 1994 and most recently in 2002 to implement Directive 98/24/EC on the 'Protection of the health and safety of workers from the risks related to chemical agents at work'. The requirements of the regulations are to:

- assess the risks;
- decide which precautions are needed;
- prevent or adequately control exposure;
- ensure that control measures are used and maintained;

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*Research has also shown that small firms see the distinctions the government makes between health, safety and environment as irrelevant to them. They want to know how to control chemicals so as to meet all regulatory requirements. To address this need, work has started on developing chemical essentials.<sup>(17)</sup>*  
 (Michael Topping, HSE)

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<sup>(17)</sup> Topping, M., HSE Health Directorate, UK: 'The use of electronic media to communicate risk' in: *Expert seminar: Substances in the workplace — Minimising the risks*, INRS, Paris, 15 October 2002, book of abstracts.

- monitor exposure;
- carry out appropriate health surveillance;
- ensure employees are properly informed, trained and supervised.

The aim of these regulations is not to carry out complex risk analyses but to make decisions on the risks and what needs to be done about them on the basis of informed judgment. Simple risks can usually be dealt with quickly. However, more complex and dangerous situations require more time and thought. For the control of substances hazardous to health, it is necessary to consider the risk from a task in relation to the probability of worker or public exposure to substances and the seriousness of such exposure.

### Aims of the action

COSHH Essentials was developed to meet a need among small businesses for practical guidance on carrying out the risk assessment element of COSHH. The aim is to help SMEs protect themselves and their employees from the harmful effects of chemicals.

### Scope of the action

The COSHH Essentials guide contains a step-by-step process to help those with little or no expertise to identify the correct method of control for the chemical being used and the task in hand. These steps are described below.

- Step 1: Getting started — Company data, etc.
- Step 2: Factors that decide your control approach
  - What is the health hazard?
  - How much is being used?
  - How dusty or volatile is the chemical?
- Step 3: Find the control approach
- Step 4: Find the task-specific control guidance sheet
- Step 5: Implement action and review
  - Assess other chemicals and tasks
  - Plan implementation
  - Consider safety and environmental hazards
  - Consider other aspects of COSHH
  - Implement action
  - Review your assessment

The starting point for the COSHH Essentials assessment is the indication of the human health hazard given by the 'R-phrase' allocated by the supplier under the 'Chemicals hazard information and packaging for supply' (CHIP) regulations. These R-phrases can be used in the same way as R-phrases applied to individual substances and, where appropriate, COSHH Essentials automatically applies those rules to arrive at correct control solutions for preparations and mixtures.

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*There is nowhere to hide from chemicals at work. Machinists use them, hairdressers use them, printers use them and farmers use them. But they must use them safely. Unions welcome anything that makes it simpler to work safely and COSHH Essentials is certainly that. <sup>(18)</sup>*  
*(John Monks, General Secretary of the TUC)*

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<sup>(18)</sup> Monks, J., General Secretary, Trade Union Congress: extract from his speech at the launch of electronic COSHH Essentials, April 2002.

Hazard groups according to COSHH Essentials

A	B	C	D	E
R36 R36/38 R38"	R20 R20/21 R20/21/22 R20/22"	R23 R23/24 R23/24/25 R23/25"	R26 R26/27 R26/27/28 R26/28	Muta cat R40
R65 R66 R67	R21 R21/22	R24 R24/25	R27 R27/28	R42 R42/43
And all substances that do not have R-Phrases in groups B-E	R22	R 25	R28	R45
		R34	Carc cat3 R40	R46
		R35	R48/23 R48/23/24 R48/23/24/25 R48/23/25 R48/24 R48/24/25 R48/25	R49
		R36/37 R 36/37/38	R60	Muta cat3 R68
		R37 R37/38	R61	
		R41	R62	
		R43	R63	
		R48/20 R48/20/21 R48/20/21/22 R48/20/22 R48/21 R48/21/22 R48/22	R64	

There are two main factors that affect whether chemicals in the workplace are likely to harm health:

- (1) the type of damage the chemical causes and the amount needed to cause that damage;
- (2) how much is likely to get into the air and be breathed in or come into contact with the skin or eyes.

This in turn depends upon its dustiness or volatility.

COSHH Essentials uses this information to select one of four control approaches:

**Control approach 1: General ventilation**

A good standard of general ventilation and good working practices.

**Control approach 2: Engineering control**

Typically, local exhaust ventilation ranging from a single point extract close to the source of hazards, to a ventilated partial enclosure. It includes other

engineering methods of control, e.g. cooling coils for vapours, but not complete containment.

**Control approach 3: Containment**

The hazard is contained or enclosed but small scale breaches of containment may be acceptable. Often used where a substance is very hazardous or a lot of it is likely to go in the air.

**Control approach 4: Special measures**

Expert advice is needed in selecting control measures and you should seek further help.

The user can find the specific control approach for his firm by reading an easy table ‘Find the control approach’ (see below). Depending on the hazard group of the substance, the amounts used, and the volatility and/or dustiness of the chemical, the control approach can be chosen. In the electronic version, this selection is made automatically via the programming.

**Find the control approach**

The number in the box represents the control approach.

Amount used	STEP 2C			
	Low dustiness or volatility	Medium dustiness	Medium dustiness	High dustiness or volatility
<b>Hazard group A</b>				
Small	2	3	1	1
Medium	3	3	1	3
Large	3	1	2	2
<b>Hazard group B</b>				
Small	3	3	1	3
Medium	2	2	2	2
Large	2	2	2	2
<b>Hazard group C</b>				
Small	1	2	1	2
Medium	2	2	2	2
Large	2	4	4	4
<b>Hazard group D</b>				
Small	2	2	2	2
Medium	2	4	4	4
Large	2	4	4	4
<b>Hazard group E</b>				
For all hazard group E substances, choose control approach 4				

*Most of the COSHH Essentials manual consists of practical solutions. It contains more than 60 control guidance sheets giving specific advice for common industrial tasks such as weighing, mixing and filling*

Most of the COSHH Essentials manual consists of practical solutions. It contains more than 60 control guidance sheets giving specific advice for common industrial tasks such as weighing, mixing and filling.

To date, COSHH Essentials has covered liquid and solid chemicals. It did not cover process fumes, process dust — wood dust, quarry dust — pesticides and veterinary medicines, lead, asbestos or gases. HSE intends to include some of these dangerous substances or processes in the future with a number of extra sheets expected in October 2003.

## Stakeholders

In developing COSHH Essentials, HSE worked with the Confederation of British Industries (CBI) and the Trade Union Congress (TUC). Both employers and trade unions agreed that the legislation is very complex for small firms and have supported this new innovative guidance.

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## Problems encountered

In a survey (see next subsection) only one of 10 respondents had experienced any problems with the guidance. Two kinds of problems were mentioned: firstly, those who feel the manual is not sufficiently specific for the work they do and, secondly, those who require more general, simpler guidance on the legislation.

HSE itself sees the need to include more substances and risks from processes such as process fumes or dusts. These risks will be increasingly covered in future.

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The use of chemicals leads in many cases to waste, wastewater and emissions into the air, which also demands knowledge of and compliance with environmental regulations. Environmental information is not included at present.

## Results and evaluation of the action

### *Systematic evaluation by a survey*

HSE commissioned a consultant to undertake a survey among employers and organisations that purchased a copy of the COSHH Essentials guidance document. Five hundred interviews were undertaken over the telephone during February and March 2001.

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*HSE commissioned a consultant to undertake a survey among employers and organisations that purchased a copy*

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The key aim in carrying out the survey was to assess if COSHH Essentials was really helping to improve chemical control among SMEs. The target sample for the survey was SMEs, defined as establishments with up to 249 employees at the site of interview.

### *Purchase of COSHH Essentials*

Three quarters of respondents to the survey became aware of COSHH Essentials via HSE leaflets. Leaflets are the most important source of awareness. There are a number of other sources, the most important being adverts and the HSE Infoline enquiry service. Approximately one in eight survey respondents has attended a seminar or workshop on COSHH Essentials.

### *Profile of respondents*

Very small firms make up a smaller proportion of purchasers of COSHH Essentials than the overall population of firms in the United Kingdom. The guidance may therefore not be hitting the smallest firms. A reason might be that these smaller firms may not have an employee with dedicated responsibility for health and safety.

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Just over half of the respondents feel they were moderately familiar and more than two-fifths feel they were very familiar with the regulations. More than half of the micro-firms (with up to 10 employees) and larger firms (with between 200 and 249 employees) in the sample say they are very familiar with the regulations. Only a third of firms with between 50 and 99 employees on site are as confident of their knowledge.

### *Use of COSHH Essentials*

According to the survey, more than three quarters of the SMEs have actually used the information package. Just over a fifth of the sample have not used COSHH Essentials since receiving it.

Three fifths of those firms that have used COSHH Essentials started by following the assessment system. Just over a third went straight to the task-specific guidance sheets. Only a few enterprises using the COSHH Essentials system experienced any problems while using the assessment system. Problems with the assessment system were reported with the use of step 4 of the process (selecting the appropriate task-specific control guidance sheet). Step 2C (deciding how volatile liquids are) also appears to have caused many of these problems.

The majority of firms that have used COSHH Essentials stated that they were able to select the right control guidance sheet for their needs. A sizeable proportion of respondents have consulted the sheets for information on ventilation, storage, personal protective equipment, dust extraction and containment.

Ninety per cent of firms that used the guidance were content with the general control guidance and the task-specific guidance sheets. They felt that the sheets contained the information they needed. Where additional information was required, firms stated that they required more specialised or specific information. However, some firms felt they required more general information.

### *Practical steps taken*

More than three quarters of the firms that have used COSHH Essentials since they received it have taken some action as a result of using the guidance. The most frequent action was to check that existing control measures are sufficient. COSHH Essentials is often used as a reference document to check existing measures.

Close to half of the respondents have provided training or information to workers. Approximately half feel that COSHH Essentials has helped them to train people in the workplace. Only a minority feel that they need more help to control chemical risks in their workplace after having used COSHH Essentials.

Respondents that have not taken any action as a result of using COSHH Essentials argued that this is because they have decided that their existing measures are sufficient.

### *Future development of COSHH Essentials*

The majority of respondents would recommend COSHH Essentials to other businesses. Respondents were invited to make suggestions for ways in which COSHH Essentials could be improved. Many feel that the pack is insufficiently specific or specialised for their needs, although, in contrast, a number of respondents feel that a simplified version of COSHH Essentials would be useful.

Approximately half of the sample would be interested in using a computerised COSHH Essentials training package, on disk or CD-ROM. Two thirds of the firms with Internet access expressed interest in an Internet version. There is an even higher level of support for an 'extended' online version of COSHH Essentials, including environmental and chemical safety advice as well as health matters.

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*More than three quarters of the firms that have used COSHH Essentials since they received it have taken some action as a result of using the guidance. The most frequent action was to check that existing control measures are sufficient. Close to half of the respondents have provided training or information to workers*

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*Having a background in chemical and process engineering moving into site management with multinational companies, this package is the most useful and practical tool that I have seen produced by the HSE. The best thing that they can do with it is to promote it more throughout business. <sup>(19)</sup> (Gerry Martin, Operations Manager, Hayman Ltd, Essex)*

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<sup>(19)</sup> Martin. G, Operations Manager, Hayman Ltd, Witham, Essex: extract from his presentation at the launch of electronic COSHH Essentials, April 2002.

Additionally, HSE recognises the need to include more substances and risks from processes such as process fumes or dusts. These risks will possibly be covered in future, starting with a few process dusts, in October 2003.

In many cases, the use of chemicals leads to waste, wastewater and emissions into the air, which requires knowledge of and compliance with environmental regulations. Environmental information is not included at present, but HSE is looking into the feasibility of integrating health, safety and environmental assessments.

#### *From COSHH Essentials to e-COSHH*

The success of the paper version of COSHH Essentials motivated HSE to consider how to improve COSHH Essentials and make it more accessible to business. In April 2002, electronic COSHH Essentials — 'e-COSHH' — was launched. e-COSHH Essentials is now available free as part of 'hsedirect', a database of all British health and safety legislation.

e-COSHH Essentials is interactive and much faster. It carries out an online risk assessment to give businesses practical solutions for their workplaces. It simply asks users to input readily available information about the chemicals they use and the way that they use them. The system then automatically identifies the correct control solutions and produces easy to follow instructions on how to put the guidance into practice and carry out other duties required by COSHH. The web-based system has hypertext links throughout so the user can get to other guidance documentation.

In the first 11 months from April 2002 to March 2003, over 52 000 online anonymous assessments were completed; more than 113 000 visits to the e-COSHH site were logged, which equals well over 1 000 000 hits.

Phase 2 of e-COSHH, due for launch in October 2003, will cover a few process-generated emissions (foundry fumes and dust, rubber fumes and dust, and wood dust in woodworking) and three leading causes of occupational asthma (isocyanates in motor vehicle repair, flour dust and wood dust). It also plans to cover common tasks involving chemicals in commercial and retail premises that are typically enforced by local authority environmental health officers.

#### **Identified success criteria**

Guidance seems to be a highly appreciated tool when dealing with chemicals. Looking at the large number of existing guidance documents from authorities, COSHH Essentials was extraordinarily successful. All guidance documents aim to reduce the complexity of legislative requirements but in the case of COSHH Essentials the approach seems to have met the needs of companies in many ways, with regard to the general approach, the style of presentation and the approach of 'simplification'.

Two main reasons for success seem to be evident.

(1) The guidance is not simply an explanation of existing regulations or an awareness-creating 'eye-opener'. It allows an individual risk assessment. In this sense it is interactive. e-COSHH offers even easier and better possibilities for such interactivity.

(2) The guidance control sheets offer practical solutions for standard situations. The variety of options offered is a big help for all lay people.

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HSE has put a lot of effort into making e-COSHH the well-known tool it is today. HSE uses all kinds of channels such as building links to and from OSH web sites, mailings to 60 000 businesses, presentation at fairs and exhibitions, articles, workshops, use of employers' and trade union networks, etc.

### **Transferability**

A great deal of interest in e-COSHH has been shown, both by other EU Member States and internationally.

BAUA — the Federal Institute for Occupational Safety and Health in Germany — has been helping HSE with the technical validation of e-COSHH Essentials.

The International Labour Organisation (ILO) in conjunction with the International Occupational Hygiene Association (IOHA) have been using COSHH Essentials as the structural basis for advice on chemical risk management for developing countries.

### **Contact information**

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COSHH information on the Internet  
<http://www.hse.gov.uk/hthdir/noframes/coshh/coshh10.htm>

e-COSHH  
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## PIMEX — Picture mixed exposure (Austria)



### Key points

- Combined visualisation of work and exposure
- High motivational impact for companies and workers
- Successful intervention to reduce risks
- Effective transfer between European countries

### Introduction

Measurements of chemical exposures in workplaces require complex chemical and engineering knowledge. The measurements are performed by specialists and the results are presented to the company some weeks later in the form of measurement documents.

PIMEX is a method which combines video filming and simultaneous measurements of different workplace exposures using fast response real-time reading instruments. Videos give better insight into the variation of exposure during the manual handling of chemicals.

The AUVA (Austrian Social Insurance for Occupational Risks) headquarters in Vienna have been using the system for more than 10 years with successful results in many companies. Since then, some hundred PIMEX measurements have been performed. PIMEX was first developed in Sweden. PIMEX-based techniques are in use in Sweden, Finland and the United Kingdom. However, the most frequent and regular use is in Austria.

### Background

New strategies and tools that can help to increase motivation/identification and implement effective control measures are needed. Visualisation methods seem to be very suitable for this purpose. These methods should be sophisticated,

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*The PIMEX method is very well suited to measure the toxic concentrations in workplaces (ÖGB, Austrian Trade Union Federation, Arbeitnehmerschutz-Reformgesetz 2002 booklet)*

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*The AUVA have been using the system for more than 10 years with successful results in many companies. Since then, some hundred PIMEX measurements have been performed. PIMEX-based techniques are in use in Sweden, Finland and the United Kingdom. In the Austrian version it is possible to measure up to six exposure parameters simultaneously*

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scientifically and technically acceptable, and at the same time understandable and simple to handle.

The measurement of factors which can affect the health of workers is normally done with standardised measuring equipment. Typical factors measured are chemical exposures (vapour, gas and dust), physical exposures (noise, vibration and electromagnetic fields), ergonomic conditions (muscle stress, temperature, humidity and light) and biological reactions (pulse and respiration).

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*PIMEX is a method which combines video filming and simultaneous measurements of different workplace exposures using fast response real-time reading instruments. Videos give better insight into the variation of exposure during the manual handling of chemicals*

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Using PIMEX allows a combination of measuring results with video pictures. The situation in a workplace is filmed with a video camera and presented on a computer monitor. At the same time, real-time instruments and sensors are attached to the worker being video-monitored. The exposure data, workloads and the corresponding medical data are recorded with direct reading instruments and inserted simultaneously into the video pictures. Video pictures and measured data are stored on the computer's hard disk and are available for further evaluation. All measurement results can be presented as moving bars, digital values or a time diagram. This gives the possibility of showing the exposure in the workplace, defining measures against peak values and recognising relations between loads and changes in medical data.

The method was originally developed in Sweden by Prof. Gunnar Rosén at the Swedish Institute of Working Life in Stockholm. It was based on a video-mixer to combine the film and the data of the real-time reading instrument. After three years of development, the new PIMEX version was successfully used in Austria. In the Austrian version it is possible to measure up to six exposure parameters simultaneously.

The videos of different working situations can be used for the on-site training of employees and to motivate employers to invest in the improvement of safety and health. Showing on screen a combination of picture and measurement has a much higher impact on the people concerned inside the company.

### Aims of the action

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*The videos of different working situations can be used for the on-site training of employees and to motivate employers to invest in the improvement of safety and health. The results should help all companies to make analyses of workplaces easier, less expensive and with a higher motivational impact*

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The PIMEX method has a very large field of application. PIMEX has been used, first of all, as a tool for evaluation of measures in workplaces aimed to reduce exposure to air pollutants. It has also been used to find reasons for high exposure. The goal of the use of PIMEX is to improve working conditions through a better visualisation of measurements/monitoring combined with pictures. The results should help all companies to make analyses of workplaces easier, less expensive and with a higher motivational impact.

A barrier for improvements at workplace level is the complexity of the matter, the interpretation of results, and the identification and practicability of solutions. PIMEX is a tool for reducing the difficulties connected with these factors.

Another well-known barrier for the improvement of working conditions is that some of the workers keep to an acquired conventional and risky working style. The combination of video and measurement opens up the possibility to visualise risks combined as video, picture and measurement data. By watching the film the worker recognises the connections between exposure and the working situation and is able to optimise his working style. This will help to motivate workers to adopt changes in work procedures.

It also helps to fulfil the duties outlined in Council Directive 89/391/EEC. This directive obliges all European employers to evaluate the risk in a risk assessment procedure and adopt appropriate measures.

## Scope of the action

### *Technology*

The innovative idea behind PIMEX is not to invent new instruments but to combine existing measurement technologies and conventional computer and video technology via software applications. The system can be used to visually combine on the computer screen the measurement results with a real-time video record of the work. Such an approach gives a much better orientation regarding the working situations which lead, for example, to unnecessarily high peak loads, etc.

The current software program allows the operator to select the display format. For the digital display format, icons are used, e.g. a heart symbol represents heart rate data. Time plots and bar graphs can be appropriately titled, for example 'CO' for carbon monoxide.

### *Practical activities*

A PIMEX measurement in its current version requires two persons, one for filming and one for measuring. The signals can be transmitted by cable or telemetric means. In terms of equipment, a good notebook, a video camera, and mixing software are needed.

Every year, in 10 courses, AUYA trains OSH specialists from companies or labour inspectors in the use of PIMEX.

AUYA has promoted PIMEX in videos and seminars where a number of examples of measurements are recorded. After recording the data and the video, the results are immediately shown to workers and other people concerned within the company.

Among the most prominent examples, PIMEX has been used to reduce exposure to chemicals in small companies with a high level of manual handling of chemicals. These are for example companies dealing with plastic reinforcement including styrene (ski and snowboard production) or screen printing shops (using alcohols and other solvents). In addition, large companies with process-generated chemicals, such as foundries or steel production, have used PIMEX.

### *Extension of uses*

In recent years, PIMEX technology has been gradually improved and its functionality extended. The improvements include better sensors and data loggers, better presentation (e.g. PIMEX Grid), and greater convenience for workers due to better sensors embedded into helmets or clothing. All these improvements contribute to a better usability and easier application.

PIMEX videos can effectively be used for training purposes. They fit into the formation programmes of OSH personnel as well as into training units in the vocational training of apprentices.

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*This method affords very good documentation and understanding of the appropriate procedure and organisation for lamination work, so as to minimise the laminator's exposure (Harald Frostling, investigator for the Swedish Work Environment Authority)*

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*PIMEX has been used to reduce exposure to chemicals in small companies with a high level of manual handling of chemicals*

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## Problems encountered

Technical problems have been overcome in recent years. There have been some problems with the interface to certain measuring instruments and with the reliability of the telemetric transmissions in industrial workplaces. The usability and reliability must be of a certain level to see PIMEX as a support that makes assessment easier.

In a few cases, workers did not want to be filmed or have their biological reactions monitored. As PIMEX is an approach to improve their situation, the number of such cases is very limited.

## Results and evaluation

A systematic evaluation has not yet been done. AUVA states that in all companies measures were taken to improve the weak points identified.

In a European project called WISP ('Workplace improvement strategy by PIMEX'), partners from Austria, Sweden, Finland and the UK tested the effect of PIMEX. Examples showed that it was possible to reduce the exposure by more than 90 % merely via a more effective use of necessary prerequisites that already existed in the workplace.

## Identified success criteria

Success depends on four factors in comparison with traditional measurements:

- visualisation;
- real-time documentation;
- impact of the immediate presentation of results;
- possibilities for identifying technical details such as peak exposures or the quality of the ventilation, etc.

The visualisation tools contribute significantly to motivating workers and other actors to improve the working conditions. They provide the necessary knowledge to actively participate in searching for solutions. All the staff concerned — managers, supervisors, or other persons responsible for working conditions — are much more able to identify the relationship between work, exposure and control measures.

## Transferability

The use of PIMEX in Austria is already an example of a successful transfer. PIMEX was originally created in Sweden at the Institute for Labour Science. The technology is in use in Sweden, Finland, the UK, and most frequently in Austria.

It is now used not only for workplace improvement but also for technical purposes, e.g. to test ventilation. PIMEX is also used to identify ergonomic overload of workers in certain working conditions, such as construction work.

The price of a PIMEX system excluding the measuring equipment is today approximately EUR 15 000. This comparatively low price offers the chance for smaller OSH units or institutions to use the system too.

## Contact information

### Austria

Hubert Novak

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*PIMEX has a great impact on the motivation of the workers and the people dealing with OSH issues inside companies (Hubert Novak, AUVA)*

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*The use of PIMEX in Austria is already an example of a successful transfer. PIMEX was originally created in Sweden at the Institute for Labour Science. The technology is in use in Sweden, Finland, the UK, and most frequently in Austria*

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## International chemical safety cards



### Key points

- International cooperation of chemical safety experts and industry representatives
- Well-formulated organisation and criteria guide to ensure consistent quality
- Education and dissemination of information on hazards related to chemicals

### Introduction

'International chemical safety cards' (ICSC) is an information dissemination project created by the International Programme for Chemical Safety (IPCS) in cooperation with the European Union. The aim of ICSC is to provide essential information on chemicals, their properties and appropriate safety measures in a concise format to be used at 'shop-floor' level by workers and employers, and as a reference when preparing safety data sheets (SDSs). The original cards are available on the Internet free of charge. They are translated into several languages, and versions in 16 languages are available on the Internet. The ICSC cards are peer-reviewed in an expert meeting where toxicologists, occupational hygienists, chemists, medical doctors, and industry representatives discuss and evaluate the cards.

The IPCS is a collaboration programme of the International Labour Organisation (ILO), the World Health Organisation (WHO), and United Nations Environment Programme (UNEP). It was established by the memorandum of understanding in 1980 between the executive heads of UNEP, the ILO and the WHO. The main objectives of the IPCS programme are to carry out the assessment of the hazards posed by chemicals to human health and the environment, and to disseminate relevant information for warning and prevention against these hazards. The ICSC project is funded by these organisations and the EU.

### Background

In 1972, the United Nations Conference on the Human Environment in Stockholm, Sweden, recommended that the WHO should respond to the threats that the increasing exposure to harmful chemicals posed to human health and the environment by creating a programme for the early warning and prevention of these harmful effects, and assessment of the potential risks to human health.

The project of the ICSCs was set up to meet the basic information needs of workplaces regarding the management of chemicals. Currently, the project also contributes to the implementation of the recommendations made by the 1992 United Nations Conference on Environment and Development (UNCED) for environmentally sound management of toxic chemicals. SMEs and workplaces in less developed areas of the world particularly need concise information for the training and guidance of workers, and risk management by the employer. The cards may be used as the source of information. The ICSCs have no legal status and they should be seen rather as an international peer-reviewed reference material to complement information of the chemical manufacturers' SDSs of the International Council of Chemical Associations.

### Aims of the action

The task of the international chemical safety cards is to provide clear and accurate information on chemicals and their safe use concerning the relevant chemicals. The project disseminates the information internationally and keeps the information up to date both in terms of the relevance of the coverage of substances as well as in the details presented.

In 2002, there were 1 305 ICSCs and the project plans to prepare up to 2 000 validated cards in the coming years.

### Scope of the action

The ICSCs are prepared in a continuous process by scientists from specialised institutes around the world. The IPCS member states designate the institutes in their countries. The participating institutes draft and peer-review each other's cards to ensure integrity and validity according to the guidelines of the compiler's guide in the twice-yearly IPCS meetings for peer-reviewing the international safety cards.

Chemicals are chosen for the ICSCs project in three separate ways. Firstly, the member states of the IPCS may propose new chemicals to be included in the peer-review process. Secondly, the peer-review group follows the worldwide discussion on chemical hazards and may select chemicals that are already or will be a priority of chemical safety programmes of bodies such as the Organisation for Economic Cooperation and Development (OECD) and the European Commission, or chemicals that may not be used so widely in developed countries but for which the request for information is high in these countries. Additionally, external expert institutes such as poison control centres may also propose substances to be included in the project.

The process of drafting and peer-reviewing proceeds according to the following flow-charts.

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*The task of the international chemical safety cards is to provide clear and accurate information on chemicals and their safe use*

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*The ICSCs are prepared in a continuous process by scientists from specialised institutes around the world. The IPCS member states designate the institutes in their countries. The participating institutes draft and peer-review each other's cards to ensure integrity and validity according to the guidelines*

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*The cards are created using a computer program, which includes a library of safety phrases, data entry modules, an online guide for selection criteria and use of standard phrases, and a module for translation of the ICSCs from English to a language into which standard phrases have been translated. The new and updated cards are circulated for comments to over 250 contacts*

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*The project has been productive but due to the peer review and translation process somewhat slow. The peer-reviewing process is effective in finding accurate and relevant information but is consequently also slow to answer demand for information on new, urgent risks*

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*The updated cards are available on the web site of the International Labour Organisation: <http://www.ilo.org/public/english/protection/safework/cis/products/icsc/index.htm>. In 1998, the web site was visited 20 000 times and the number of visits has recently increased to 500 000 visits per month*

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The 'Pis' are partner institutes appointed by the IPCS member states.

The ICSCs are updated regularly following the peer-review procedure. The cards are created using a computer program, which includes a library of safety phrases, data entry modules, an online guide for selection criteria and use of standard phrases, and a module for translation of the ICSCs from English to a language into which standard phrases have been translated. The new and updated cards are circulated for comments to over 250 contacts.

The first page of an ICSC summarises the basic information on the acute hazards and symptoms related to the chemical, appropriate measures to prevent accidents and exposure, packaging and labelling, and instructions for storage, first aid, fire extinction and spillage disposal. The second page gives more advanced information on the physico-chemical characteristics and dangers of the chemical, important exposure routes, effects of short- and long-term or repeated exposure, and occupational exposure limits.

In addition to the cards in English, the member states of the IPCS have translated the cards into 26 languages including French, Japanese, Russian and Spanish. National collections of the cards, such as the Finnish and US versions, also contain the national regulations with regard to packing, labelling and occupational limit values.

### Problems encountered

The project has been productive but due to the peer review and translation process somewhat slow. The transfer to Internet too, in spite of the computer-based program, takes time. The original, updated database available on the ILO's web site is dated 2002 (as of 9 June 2003). In a large consortium, the compiler's guide has ensured constant quality and consistency between the cards provided by several authors but the scientific editor still has plenty of editorial work.

As the ICSCs are intended to be used worldwide, they should be translated into all major languages. The resources for the translation work have been rather scarce and as the cards are also continuously being updated, the updating of translations for languages has a delay of between a few weeks to a few years.

### Results

The ICSCs in paperback were available for purchase from the former Directorate-General of Employment, Industrial Relations and Social Affairs of the European Commission. The latest edition is from the year 1993 and the cards are currently sold out. The updated cards have been published on the Internet since 1998. They are available on the web site of the International Labour Organisation: <http://www.ilo.org/public/english/protection/safework/cis/products/icsc/index.htm>. In 1998, the web site was visited 20 000 times and the number of visits has recently increased to 500 000 visits per month.

The cards have been successfully used for teaching chemical safety by the United Nations' projects in developing countries. The cards have been also tested in courses on chemical safety. Their structure has been considered clear and easy to understand although the target group may not always know the terms related to specific sciences and medicine.

## General evaluation

The ICSC project has been very effective in pulling together reliable and concise presentations on basic features and measures related to chemical substances hazards. It has provided easily distributable material on dangerous substances widely used in workplaces across the world. The cards can be understood in a wide variety of workplaces.

The ICSCs present information that the manufacturer could use in the workplace to compile safety information or SDSs. As the quality of data sheets could be improved, the ICSC could have an important role in providing the basic information on certain dangerous substances, although they deal only with pure substances, which are seldom used as such in workplaces. On the other hand, the information provided in the ICSCs is very basic and the employers and safety representatives may need to look for further information from other resources. Although ICSCs have a simple structure, the full comprehension of the ICSCs, as with any other data sheets on the use and protection against chemicals hazards, requires some knowledge in several areas of science, and can be used as a training tool.

The ICSCs are a tool that could basically be used in all of the countries and workplaces of the world, wherever chemical substances are present. However, this kind of material should be translated into as many languages as possible, as the workplaces should receive this material in the language they know best, preferably in their mother tongue. The current system for translation is slow, however, even with regard to so-called international languages.

The peer-reviewing process is effective in finding accurate and relevant information but is consequently also slow to answer demand for information on new, urgent risks. The Internet could be used to convey messages on these sorts of priority risks but it does not yet reach the less developed countries of the world well enough. Therefore, a new edition on paper has been requested.

## Identified success criteria

The ICSC project has been successful because it uses a well-formulated and competent organisation structure to collect, review and present information on various topics of chemical safety. It has contact persons, who cover several areas of expertise throughout the world, as well as commonly agreed criteria and facilitating tools to ensure consistent and constant quality of the products.

For dissemination of the cards, the IPCS has been able to utilise its large and well-known networks and the Internet. The Internet is a very suitable tool for dissemination of information on chemicals in database format as it allows the cards to be produced and indexed in several user-friendly forms. The form itself reflects the titles of the safety data sheets and is therefore perhaps easier to adapt and read by the users.

## Transferability

The ICSCs are prepared by a large consortium of research organisations with several hundred contact persons worldwide. As such, this IPCS project cannot be transferred without large resources to other settings but contains several success factors that could be adapted to any information dissemination project.

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*The participating experts are devoted to contributing to this information dissemination project as they know that their work will be beneficial to the workplaces of the world (Stina Takala, Assessment of Risk and Methodologies, WHO International Programme on Chemical Safety)*

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## CONCLUSIONS

The cases above show that effective and successful communication regarding dangerous substances can be very diverse in approach. Nonetheless, there are some recurrent features in the cases. Although there was no real clear-cut correlation between the nature of the case and the communication methods used on the one hand, and the level (company, supplier, international, national, regional) at which the information was dealt with on the other, the cases indicate that some methods work better than others. The possibilities and the nature of the communication change according to a combination of variable elements such as the target group, the support from the partners, and the available means.

## 6.1. QUALITY OF THE INFORMATION

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Ensuring the success and effectiveness of the communication is only possible if quality information can be provided. Building up quality information is not a process that can be done overnight. Most of the cases reflected hard on the method of gathering and disseminating this information before setting up and carrying out the action.

What kind of information is quality information depends largely on whether the source of the information is reliable and if the information is suited to the level of the target group. Workers handling dangerous substances on a daily basis need a different kind of information than policy-makers creating new legislation.

### Prior risk assessment

All the cases value good sources of information. In some of the cases, for example Würth Oy and the two biohazards cases, it was based on a prior risk assessment to establish what the current situation was. A comprehensive view of the problems present was felt to be a necessary first step most of the time. Sometimes the cause and extent of the problem had already been established previously, as was the case for the asbestos network. In the SDS checklists case, assessment of the actual situation was complemented by a debate on solutions, involving the experts.

The conclusions based on this risk assessment determined the kind of action that had to be undertaken and the method for informing the workers. Institutes or individuals with expertise on the issues were often consulted during the projects, at company level and in a wider context.

### Partners

Expert partners were involved in almost every case. The amount of expert input depended on the scope, the degree of complexity, and the level of the information.

At company level, it was mostly the OSH/environmental department, sometimes in cooperation with external experts or the company management, who coordinated and followed up the actions, and informed the workers. Experts were more frequently and more deeply involved in this process if the scope of the

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project went beyond company level. With sector initiatives at regional, national or even international level, the actions were in most cases initiated by insurance companies, federations or social partners. The industry but also government departments, regional committees and research institutes specialised in different fields were often involved in the communication and consultation process.

Projects at regional, national and international level also involved research institutes, occupational safety and health institutes, institutes promoting health and safety, ministries, and information centres.

## Legislation and safety data sheets

Legislation helped to establish the information but was in most cases too comprehensive and too complicated to reach or raise awareness among the target audience. In cases where imposed legislative measures were an important part of the information, the organisers of the action translated the legislation to the specific context and needs of the target group.

### *Safety data sheets (SDSs)*

An important element mentioned in more than one of the case studies (e.g. checklists on the art of writing and reading SDSs, SOMS case, international chemical safety cards), is that the most available and most utilised source of information on chemicals are the safety data sheets. SDSs are valued as an important information source for the creation of databases, instruction cards for workers, safety manuals, and other guidance on dangerous substances because they provide rather concise information on the nature of risks and the protective measures and equipment. However, the often insufficient and sometimes even incorrect information provided by these sheets gives rise to a number of problems.

The urgent need to redefine the safety data sheets was mentioned, for example, in the SOMS (Netherlands) case and the checklist case. An interesting remark put forward in the case of the checklists on the art of writing SDSs was the fact that the needs for guidance in writing SDSs vary among the different manufacturers or suppliers and that — as mentioned in the preliminary conclusions on the SOMS case — the information the end user needs also varies according to the sector and the user.

Furthermore, according to policy documents such as the European Commission White Paper, there is a general lack of knowledge on the use and features of several existing substances, hindering the provision of information on dangerous substances all along the product chain.

It is often recommended to search for additional information sources to complement the safety data sheets.

However, an initial conclusion drawn from the SOMS case is that this kind of information is sometimes harder to obtain. One of the problems is the confidentiality and availability of the information. Although companies are obliged to provide information on their products, they are in general often reluctant to give more information.

Nevertheless, a great deal of communication between supplier/producer and user or official health and environmental organisation occurs where the composition is forwarded confidentially for specific purposes like emission permits.

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*Complementing the information with other available sources and translating the safety data sheet to the specific needs of the target group, the conditions of the workplace and the context of the company is essential*

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*Suppliers will provide technical information and information on related hazards but for commercial reasons are not very keen to present information on the composition of the product. It was crucial to explain why the information is needed and how the information will be used. Drafting a privacy policy statement can be useful in this respect*

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*Consultation of the target group before and during the communication process is very useful to get and keep a realistic view of what is happening and needed*

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Complementing the information with other available sources and translating the safety data sheet to the specific needs of the target group, the conditions of the workplace and the context of the company is therefore essential.

Another question that was brought to the fore during the debates in the framework of the SOMS case was: if complementary information is needed because the SDSs are not complete, who should take the initiative? Is it the manufacturer or supplier, or the end user? This poses another problem, considering that many end users do not know what information is available and how the information can be obtained.

Which specific problems can arise in the acquisition of information?

- The head offices and/or the R & D departments of many of the multinational companies are based abroad and are only willing to provide additional information if legally obliged.
- The manufacturers are concerned that there will be improper use of the information on the composition of the product.
- Mentioning the hazards can cause unnecessary concern to the users. As far as exchange of information on health hazards is concerned, suppliers do restrict themselves in giving this. The hazards can be considerable, while the risk is small.
- Another problem is the (lack of) availability of environmental and toxicity data. In other words, to estimate the environmental and health risks of a product you may have to rely on insufficient scientific data.
- Suppliers will provide technical information and information on related hazards but for commercial reasons are not very keen to present information on the composition of the product.

In cases where information from the target group was needed as part of the action, enterprises were not always eager to provide this information. For this reason, it is important that the organiser of an action takes into account the potential sensitivities of the target audience and the collaborators.

For instance in the Würth Oy case, the organisers had to clarify the goals of the audits and the collection of information because some of the enterprises did not understand the aim of the action. Other enterprises refused to collaborate because they feared that essential company information would leak out. This is also an element that has been mentioned in the SOMS case, where sometimes the enterprise has found valuable information thanks to expensive research and wants to avoid competitors using it.

It was crucial to explain why the information is needed and how the information will be used. Drafting a privacy policy statement can be useful in this respect.

### Consultation of the target group

Consultation of the target group before and during the communication process is very useful to get and keep a realistic view of what is happening and needed at the level of the target group. A bottom-up approach has proven particularly successful at company level, e.g. in the case of GIPSM at Lilly Development Centre and of Glanbia Ingredients, and at the sector level, e.g. the SOMS case where the experimental plots at company and sector level were used to gather experiences and advice on ways to adapt the national legislation, and was used to fine-tune the organisers' information.

Actions to obtain feedback from the workers at company level are easier and can even be informal. Beyond company level, other techniques for collecting feedback are necessary.

In the case of Glanbia Ingredients, a case at company level, the feedback was informal. In the case of the asbestos centres, executed at sector level, this collection was accomplished using questionnaires sent out to every participant. However, in other cases, e.g. in the case of the meat processing industry, feedback was obtained through regular company visits.

#### *Comprehensive and up-to-date information*

The comprehensiveness of the information was one of the factors that contributed to the quality of the information provided to the target group. Different experts mostly ensured they guaranteed comprehensiveness (e.g. the case of the meat processing industry, low-cost interventions).

Most organisations considered up-to-date, comprehensive and assessed information fundamental to the communication process. Permanent monitoring, evaluation and improvement of the information are therefore important elements in the projects described, especially in projects where the focus was on the development or improvement of data, the follow-up and keeping up to date of the information proved to be of great importance.

Unfortunately, comprehensiveness of data is not always a realistic option, even if it would be preferable. As stated by the International Programme on Chemical Safety project <sup>(20)</sup>, it is possible most of the time to assess the intrinsic hazards posed by a certain chemical but the downstream risks, the risks that emerge during the use of a product, including all the precise details needed when using a specific substance, can often not be calculated.

The Dutch case of the experimental plots and the Swedish checklist case on the art of writing and reading SDSs proved that it can be useful to reflect upon the method used to gather the information before disseminating existing information to a target group. Is the information we want to use valuable, correct and comprehensive? How was the information collected or generated? Where are the knowledge gaps and how can we solve this? Does the information respond to the needs of all the parties in the information process?

#### *Information adapted to the target group*

Every case had a well-defined target group and adapted the information according to the needs of this group. Personal experiences or demonstrations from colleagues to illustrate the information and to involve the target audience were used to inform smaller groups of people.

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<sup>(20)</sup> *International chemical safety cards (ICSCs)*, descriptive note, International Labour Organisation, 1999, <http://www.ilo.org/public/english/protection/safework/cis/products/icsc/dtasht/intro.htm>

## 6.2. DISTRIBUTION OF INFORMATION

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Several conditions can help to ensure the best possible distribution of information and determine if the information reaches the target public in an optimal way. Although the case studies provide rather concise information on the reason why organisers choose the instruments that they use to disseminate their message, it can be derived from the case studies that they have reflected on the way of informing the public. Some of the case studies combine different instruments and methods to attain the predetermined goals of the action.

### Means

Brochures, flyers and posters are particularly useful for informing a wide audience about concise and to-the-point information. If the target group needs to be informed more thoroughly, a guide or manual can be helpful, especially when it is complemented with guidance via a 'toolbox meeting', a training session, workshop or information session.

The actions set up by third parties often made use of the Internet as a quick and reliable channel to spread a message and give guidance. A disadvantage of this medium, however, is that the target group has to have easy access to the medium and has to take the initiative to search for the information, a condition that is less present when using posters or brochures to raise awareness among the target audience.

For cases at company level, smaller tools and internal channels such as the intranet can be used. This proves to be very practical for providing workers or visitors immediately with up-to-date information but is again only fully effective if they have easy access to the tool and are motivated to make use of it. The same holds true for information provided via the Internet and CD-ROMs. It is also very important that the knowledge support is user-friendly and quick.

A lot of the success of a training session, workshop, etc. depends on the method, the available instruments, and of course the audience that will be addressed. The choice has to be considered case per case. Training and the provision of face-to-face information seem adequate at every level. It can range from simply informing workers to training 'on the job' or interactive sessions where interaction with the public plays the key role. Material to demonstrate and illustrate the message such as videos, posters, slides, demonstrations, etc. can be very useful. A condition for success is to find a good balance between the visual and the knowledge part. Too much focus on practical examples can distract the public from the real message.

Working with dangerous substances calls for responsible behaviour. Therefore, an erroneous understanding of the information provided can have a serious impact. Testing out the understanding of the information provided during the training and information sessions is therefore necessary.

The effect of training sessions, information sessions and publications can be improved by ensuring that the information is not without commitment. This can go from a simple oral verification to evaluations with a test the participants have to pass before receiving a certificate and the right to apply the information.

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## Large partner network

Using a broad partner network facilitated reaching the target group. A well-chosen partner network ensured that the right channels were used to transfer the message and gave more credibility to the information. First of all, broad support for the communication is important to disseminate the message. A large partner network usually possesses more possibilities for distributing the information: the larger the partner network, the more people that can be reached and the higher the response. The broader the scope of the project, the broader the partner network that was set up. This works especially well in projects initiated at the international, national or regional level.

## Characteristics of the target group

To get the message across, awareness of the specific nature and psychosociological context of the target group is necessary but poses problems if the group is heterogeneous. What level of schooling does the target public have? Do they need theoretical or practical information or both? Are cultural or sociological features significant? What level of education did they reach? These are questions that can help to determine the right tone and complexity of the message.

Adequate and consistent behaviour from management is certainly a must when it comes to raising awareness or implementing a change in the working processes. Especially on a smaller scale such as the company level, it is important to set a good example and to follow the actions through. If workers feel that the hierarchy and the OSH department support and manifestly follow the new rules that have been established, they will identify themselves more easily with the innovations.

This is more difficult when the target public is located away from the informing body, e.g. at national, regional and international level. However, this can be solved if there is support from a level closer to the target audience.

## Convincing and stimulating

Convincing arguments for the target group concerning the reason for the action, and the necessity of following the recommendations, help to successfully transfer the information and stimulates the audience to listen, learn and remember the message afterwards. Raising awareness and informing a target public works a lot better if the meaning and the reason for a new policy, strategy or measures are clear. Explaining the benefits for them and for their environment if they apply the information helps to motivate the audience.

Most of the projects at company level understood this, and included information sessions and gave workers a chance to comment before and during the changes. In the case of the Lilly Development Centre, it was mentioned that future fundamental changes will always be presented to the workforce before they are implemented. Good communication is the basis for confidence in the company. It helps workers to assume more responsibility and to consider themselves as jointly responsible for the company.

Whereas the communication direction in the cases at sector, national and international level is more often one way, at company level the workplace level is consulted more often in the communication process. An important element in the participation and involvement of the workers that may not be overlooked

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is the fact that the workers have to get enough background information about the issues they are consulted on. Another necessary element is for them to be kept informed during the whole process.

### *Evaluation of the effects*

Although most of the cases state that the actions were successful, few of them mention an actual evaluation by the organisers afterwards. Results were often measured by the number of companies that were willing to collaborate and the (informal) feedback received from the collaborating experts, companies, or workers, or — if the case involved distributing written material such as brochures, leaflets, and Internet manuals — the number of downloads or the copies of a product sent.

At Polimeri Europa, the production line and technical staff mentioned for instance a better awareness about the risks of the chemical substances. Employees also indicated that an increasing number of them used the Internet tool on a daily basis.

The case study of GISBAU mentions that 30 000 to 40 000 copies of the Wings CD-ROM are distributed every year, covering theoretically 20 % of the 200 000 construction industries in Germany.

HSE has contracted out the assessment of COSHH Essentials in the form of a user survey and is measuring the number of paper copies distributed and downloads of the electronic version.

The nature of the actions sometimes makes it difficult to assess the outcomes. This is especially true in the case of actions on a broader level, where a clear view regarding the results can be difficult owing to the scope of the action.

The projects that detected specific serious and unexpected problems during implementation or afterwards were more inclined to investigate thoroughly why the problem(s) had arisen. This sometimes resulted in very valuable information, as was the case for the SOMS project, where the unexpected problems in obtaining information from the supplier companies exposed some significant obstacles in the provision of information on dangerous substances along the product chain.

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