

# **A TOOL FOR ASSESSMENT AND CONTROL OF EXPOSURE TO CHEMICALS IN SMEs**

S. TIJSEN, I. LINKS, M. LURVINK AND M. LE FEBER

TNO CHEMISTRY, DEPARTMENT OF CHEMICAL EXPOSURE ASSESSMENT,  
PO BOX 360, 3700 AJ ZEIST, THE NETHERLANDS

## **INTRODUCTION**

It is generally known, also from a study done by TNO and from research in a lot of other countries and by other organisations, that small and medium sized enterprises (SMEs), in general, fail to adequately assess and control exposure. This, in spite of existing legislation. The main causes known from international research were a lack of practical information on risks of chemicals, a lack of suitable control measures, and the absence of useful tools. Existing methods for risk assessment and management are badly defined, especially in suggesting solutions for risk control.

To improve the assessment and control of risks of hazardous substances in SMEs, TNO developed a generic tool for the SME-employer commissioned by the Dutch Ministry of Social Affairs and Employability. An additional goal is that, by using the tool, the awareness of the problem(s) by the SME-employer should be increased and that he is motivated to deal with the problem(s).

## **METHODOLOGY**

For the development of a generic tool, a list of criteria was constructed, based on the characteristics of SMEs (< 50 employees). The tool should be practicable and recognizable. Moreover, the tool should be tuned to the employers' knowledge and should preferably be used as a part of a process (and not as a non-recurring action). The tool should be as simple as possible: raising awareness and offering solutions being more important than a scientific risk evaluation. Next, several risk assessment methods from European countries have been evaluated against these criteria. The basic idea in the study was that there is no need to re-invent the wheel and therefore useful parts of existing instruments should be implemented. The following European instruments were evaluated: COSHH Essentials (Health and Safety Executive, 1999),

TRGS 440 (Rühl e.a., 1999), ASCA Check (Kittel e.a., 1996), BIA safety-check (Kittel e.a., 1996), GISCODE (Rühl and Stamm, 1997), MAL-codes (Andersen and Skjoldager, 1993; Kittel e.a., 1996), MUP (Schmidt e.a., 1994), Support making decision tool (Vincent and Bonthoux, 2000), Strategy on hazardous substances (Riala e.a., 1999), WISP (Andersson, 2000), Method for control in SMEs (Antonsson e.a., 1998), Chemische Arbeitsstoffe (AUVA, date unknown), and Risico-inventarisatie en -evaluatie van Toxische stoffen (Marquart e.a., 1997).

Based on useful parts of these methods, the generic tool was developed. At this stage, we concluded that the tool should be something that would appeal to companies, more than just a set of papers. It became clear that the only way to achieve this, was by starting an interactive process within companies using workshops. Therefore, it was decided to call our instrument a tool, more like being a toolkit than a book.

It was known at the start of the project, and became even more clear during the development of the tool, that not only the contents of a tool are relevant in the development of a successful tool. Just having a good instrument, does not guarantee its use. This is especially true for SMEs, as their time and money is scarce. As a consequence, SME-employers will only focus on relevant issues and will only use a tool, if it is worth the investment.

To stimulate the use of the tool in each company, among other things, a good introduction of the tool and adequate conditions for use in each company are at least as important. This is what is meant by the implementation. In this implementation, a possible role is seen for several actors in and around SMEs, such as suppliers, occupational health services, trade unions, and government.

To gather information on what is necessary for an optimal implementation, two workshops were held with these actors.

The goal of the first workshop, held with mostly occupational hygienists, was to get a first impression of ideas for a plan for implementation. About 2 months later, a second workshop was held with 'SME-experts', especially SME-employers, trade-organizations, and (financial) consultants to verify and deepen the results of the first workshop. The results of both workshops should lead to an action plan, meant for all actors in and around SMEs. In this plan, it would be described what actions should be done and by whom, to have an optimal implementation in the end.

## **RESULTS**

The results can be split up in 2 parts: the actual contents of the developed tool itself and the (plan for) the implementation of the tool in SMEs.

### **The tool itself**

The tool is built from several elements of already existing instruments. As indicated, the heart of the instrument is formed by table 1, that should help to indicate the problems as a starting point for appropriate solutions. The first step is to get an overview of the products used by the company and of the hazardous substances that are in it. This information usually is provided by safety data sheets or labels on the product itself.

The second step is to do a hazard assessment. In this tool, the hazard is based on the risk sentences of the product, which again are usually provided for by the safety data sheet. The result of this hazard assessment is a hazard score (A-E). The basic elements for this step were offered by COSHH Essentials (Health and Safety Executive, 1999), In the third stage, the exposure assessment has to be done. Exposure is ranged per product, activity related on the basis of: used product per day, properties of the product, use of the product, exposure control, and exposure duration. The result of this exposure assessment is an exposure score (1-4). The model for exposure assessment was built, based on aspects of several published methods (Health and Safety Executive, 1999; AUVA, date unknown; Marquart e.a., 1997).

In the last stage, a risk assessment has to be done, by comparing the hazard- and the exposure-score. The end result is a risk-score (I-III). This is presented clearly in a (green, orange, and red) colour scheme, similar to the Austrian 'Chemische Arbeitsstoffe' (AUVA, date unknown). One is able to see the main problems, at a single glance.

Based on these risk-scores, priorities can be set in controlling risks due to exposure to hazardous substances. In addition, it is encouraged to use the tool and discuss the results in an appropriate team, as is done in the Finish 'Strategy on hazardous substances' (Riala e.a., 1999).

### **(Plan for) the implementation**

It is concluded, both by the researchers as well as by the workshop attendants that instruments, like the one that is described, are successful when they are used by SMEs in practice and result in control measures taken if necessary.

One major result of the workshops was that, in general, there is a big threshold to interest SMEs that are not using this kind of instruments yet. It was concluded that it is possible to motivate a large number of these companies, but not all of them. Some companies just stay far away from considering improvement of working conditions. It is very difficult and maybe even impossible to reach such a group. In addition, an important role in motivating companies that are not improving their work climate yet, is allotted to trade-organisations. Their job is to filter all information that reaches an employer and pass the relevant part on to SMEs in an understandable format. Trade-organisations are seen as the mediator between the experts of (for example) research institutes and health consultancy agencies on the one hand, and the SME-employer and –employees on the other hand. Therefore, it was concluded in the workshops that it is seen as an important task for this trade-organisations to specify the generic tool to one that is specific for a branch and offer for example specific control measures instead of giving generic advises.

Another, maybe not so innovating, conclusion of the meetings was the fact that the SME-employer himself is seen as the major actor in the implementation process. He is the person with money and means to implement instruments. If he is not convinced that something is worth the investment, he will invest nothing. In addition, it was suggested to use generally known risks as an example. Motivation seems a keyword.

A, maybe somewhat astonishing, conclusion of the meetings was the fact that health consultancy agencies in general, at least in the Netherlands, do not focus on SMEs because they are, as they admit themselves, not profitable enough.

Furthermore, it was concluded in the workshops that in the Netherlands the labour-inspectorate has no role in the implementation process. The only task they should fulfill is to agree with instruments that are used, and to enforce legislation.

The last conclusion was that financial experts, that have contact with SME-employers on a regular basis, could help in the implementation process by motivating employers. A detailed plan for the implementation of the TNO tool and comparable instruments, based on the results of the workshops is not available yet but is under development.

## **CONCLUSIONS AND DISCUSSION**

The generic tool is almost ready, as far as the contents are concerned. A generic approach for selecting risk management measures should be added. After that, the tool can be introduced and tested in SMEs. An important part of this test is to check whether the result of the exposure assessment is in compliance with results of available exposure measurements.

With respect to the implementation, a detailed plan is under construction. This plan will describe what should be done and by whom to have a successful implementation.

*Acknowledgements* - This work was financially supported by the Dutch Ministry of Social Affairs and Employment.

## REFERENCES

Andersen E and Skjoldager Ch. Executive order on the determination of code numbers. Executive order no. 301, Danish Working Environment Service, May 1993, Denmark.

Andersson I-M, National Institute for Working Life, Zweden. Mondelinge mededeling, 2000.

Antonsson A-B, Nilsson M, Hansén O. Systematic working environment work in small companies. Presentatie op het internationale symposium: From protection to promotion. Occupational health and safety in small-scale enterprises, 4-6 May 1998, Helsinki, Finland.

AUVA. Chemische Arbeitsstoffe. Gefahren ermitteln und beseitigen. Allgemeine Unfallversicherungsanstalt, Wien, Austria, date unknown.

Health and Safety Executive, COSHH Essentials. Easy steps to control chemicals. Control of substances hazardous to health regulations. HSE books, Suffolk, 1999.

Kittel G, Elsigan G, Kummerer S. and Geyer A. Gefahrstoff- und Sicherheitsmanagement in Europa. Forschungsbericht im Auftrag der Allgemeinen Unfallversicherungsanstalt (AUVA), PPM, 1996.

Marquart J, Geuskens RBM, Lansink CJM, De Raat WK, De Weger D, Van 't Veld BFP, Knoll B. Risico-inventarisatie en -evaluatie van toxische stoffen. TNO rapport V97.186, 1997.

Riala R, Degerth R, Rantala K, Silvo K, Pylkkö T, Kultamaa A, Häkkinen P, Lameranta J and Lindroos L. Assessment and management of chemical risks at small-scale enterprises 1996-99. Presentatie op het internationale symposium: From protection to promotion. Occupational health and safety in small-scale enterprises, 4-6 May 1998, Helsinki, Finland.

Rühl R, Smola Th, Lechtenberg-Auffarth E, Musanke U, Hamm G, Vater U, Wehde J, 1999. Gefahrstoffe ermitteln und ersetzen. Überarbeitete Fassung nach Änderung der TRGS 440. BIA-Report 6/99. HVBG (Sankt Augustin), 1999.

Rühl R and Stamm R. Produkt-Code für die Anwender. Ein vielversprechender Weg. In: Gefahrstoffe in Klein- und Mittelunternehmen. Vorträge der Informationstagung am 7. und 8. Mai 1996 in Dortmund. Tb75, Bundesanstalt für Arbeitsschutz und Arbeitsmedizin, Dortmund/Berlin, 1997.

Schmidt A, Drabaek I, Midtgaard U, 1994. Integrated environmental and occupational assessment of new materials - The Danish Materials Technology Programme (MUP). National Institute of Occupational Health, Copenhagen, Denmark.

Vincent R. and Bonthoux F. Evaluation du risque chimique. Hiérarchisation des 'risques potentiels', Cahier de notes documentaires-Hygiène et sécurité du travail, N° 178, 2000.

