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No. 95

REPORT OF THE OECD WORKSHOP ON

ORGANISATION FOR ECONOMIC CO-OPERATION AND DEVELOPMENT

Paris 1995

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No. 95

**REPORT OF THE OECD WORKSHOP ON
SMALL AND MEDIUM-SIZED ENTERPRISES
IN RELATION TO CHEMICAL ACCIDENT
PREVENTION, PREPAREDNESS AND RESPONSE**

Environment Directorate

ORGANISATION FOR ECONOMIC CO-OPERATION AND DEVELOPMENT

Paris 1995

Also published in the Environment Monograph series:

Environment Monograph No. 51, *Guiding Principles for Chemical Accident Prevention, Preparedness and Response: Guidance for Public Authorities, Industry, Labour and Others for the Establishment of Programmes and Policies related to Prevention of, Preparedness for, and Response to Accidents Involving Hazardous Substances* (1992)

Environment Monograph No. 93, *Report of the OECD Workshop on Chemical Safety in Port Areas* (1994)

Environment Monograph No. 94, *Report of the OECD Special Session on Chemical Accident Prevention, Preparedness and Response at Transport Interfaces* (1995)

(For a complete list of OECD Environmental Health and Safety publications, please see page 73)

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ENVIRONMENT MONOGRAPHS

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Foreword

This Environment Monograph contains the report of the OECD Workshop on Small and Medium-sized Enterprises in Relation to Chemical Accident Prevention, Preparedness and Response. The Workshop, co-hosted by the Governments of Canada and the United States, took place in Toronto, Canada, on 3-6 May 1994. Included in this publication are the Workshop's Conclusions and Recommendations as well as the Discussion Document, which was revised following the Workshop.

The Joint Meeting of the Chemicals Group and the Management Committee of the Special Programme on the Control of Chemicals recommended that the Workshop report be derestricted. It is being published on the responsibility of the Secretary-General of the OECD.

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Introduction

The OECD Workshop on Small and Medium-sized Enterprises in Relation to Chemical Accident Prevention, Preparedness and Response was held in Toronto, Canada, on 3-6 May 1994. It was co-hosted by the Governments of Canada and the United States. The Workshop provided an opportunity for members of the OECD Expert Group on Chemical Accidents and other interested parties to consider whether small and medium-sized enterprises (SMEs) which produce, use or handle hazardous substances constitute a particular problem with respect to chemical accident prevention, preparedness and response and, if so, to begin discussions on ways of addressing the problem. The Workshop was held due to the recognition that SMEs generally do not have the same access to information, experience and technology as larger enterprises, and that this limitation on resources often limits the actions they can take.

More than 60 participants from 15 countries attended the Workshop, representing the spectrum of parties interested in the issue of chemical safety at SMEs. For example, in addition to representatives from national governmental authorities, there were representatives of local governments and emergency response agencies; industry, including SMEs, larger companies, and industry associations; trade union organisations; financial institutions; and international organisations.

The organisation of the Workshop followed the model of previous Workshops held as part of the OECD Chemical Accidents programme. Consequently, three or four speakers were scheduled for each session, with the majority of the time allocated for discussion among all participants. A Discussion Document was circulated in advance as a basis for discussion.

The products of the Workshop include a set of Conclusions and Recommendations prepared by the rapporteurs, and generally agreed to by all participants, as well a new version of the Discussion Document, revised to take into account the comments made during the Workshop. These documents are included in this report.

It should be kept in mind that the documents in this Environment Monograph have not been endorsed by, and do not necessarily reflect the views of, the OECD or its Member countries.

OECD work on chemical accidents

This is one of a series of Environment Monographs published as part of the OECD Environment Programme's work on improving chemical accident prevention, preparedness and response. OECD work related to chemical accident prevention, preparedness and response began in 1988, following a call by Ministers and other high-level officials at the OECD Conference on Accidents Involving Hazardous Substances. To supervise this work, a group (now called the Expert Group on Chemical Accidents) was established. The Expert Group includes national experts and representatives of relevant international organisations.

Representatives of industry, labour organisations, and other interested groups take part in the work of the Expert Group.

The objectives of the OECD's Chemical Accidents Programme include: the exchange of information and experience; the analysis of specific issues of mutual concern in OECD countries; and the development of guidance materials related to chemical accident prevention, preparedness and response. As a contribution to meeting these objectives, eight Workshops and two special sessions have been held since 1989.¹ Each of them has provided an opportunity for exchange of information and experience among the participants, who have included representatives of public authorities, industry, labour, public interest groups, academia, and other international organisations, including experts from non-OECD countries.

In addition, the output from these meetings has been used as a basis for the development of guidance documents, in particular the OECD *Guiding Principles for Chemical Accident Prevention, Preparedness and Response*.² Supplementary Guiding Principles will be prepared taking into account the outcome of Workshops held since 1991, and of the 1993 Special Session on Chemical Accident Prevention, Preparedness and Response at Transport Interfaces.

The Expert Group on Chemical Accidents decided that this Environment Monograph should be published, in order that the Workshop documents could be widely circulated. The Expert Group welcomes feedback from as many interested parties as possible. Comments received will be taken into account in the development of practical, up-to-date guidance materials.

¹ See Environment Monograph No. 28, *Workshop on Prevention of Accidents Involving Hazardous Substances: Good Management Practice*, hosted by the Federal Republic of Germany (held in Berlin, 1989); Environment Monograph No. 29, *Workshop on the Provision of Information to the Public and on the Role of Workers in Accident Prevention and Response*, hosted by Sweden (held in Stockholm, 1989); Environment Monograph No. 30, *Workshop on the Role of Public Authorities in Preventing Major Accidents and in Major Accident Land Use Planning*, hosted by the United Kingdom and the Netherlands, supported by the Commission of the European Communities (held in London, 1990); Environment Monograph No. 31, *Workshop on Emergency Preparedness and Response and on Research in Accident Prevention, Preparedness and Response*, hosted by the United States and Canada, co-sponsored by the United Nations Environment Programme (held in Boston, 1990); Environment Monograph No. 44, *Workshop on Prevention of Accidents Involving Hazardous Substances: The Role of the Human Factor in Plant Operations*, hosted by Japan (held in Tokyo, 1991); Environment Monograph No. 66, *Report of the OECD Workshop on Strategies for Transporting Dangerous Goods by Road: Safety and Environmental Protection*, hosted by Sweden, sponsored by the OECD Road Transport Research Programme in co-operation with the OECD Environment Directorate (held in Karlstad, Sweden, 1992); Environment Monograph No. 93, *Workshop on Chemical Safety in Port Areas*, hosted by Finland, co-sponsored by the International Maritime Organization and the United Nations Environment Programme (held in Naantali, Finland, 1993); and Environment Monograph No. 94, *Report of the OECD Special Session on Chemical Accident Prevention, Preparedness and Response at Transport Interfaces* (held in Paris, 1993).

² Environment Monograph No. 51, *Guiding Principles for Chemical Accident Prevention, Preparedness and Response: Guidance for Public Authorities, Industry, Labour and Others for the Establishment of Programmes and Policies related to Prevention of, Preparedness for, and Response to Accidents Involving Hazardous Substances* (1992). The Guiding Principles have been translated into French and Russian.

Anyone who wishes to comment on this publication (or one of the other OECD publications relating to chemical accident prevention, preparation and response) should contact their country's representative to the OECD's Expert Group on Chemical Accidents *directly*.

There is a list of Heads of Delegations to the Expert Group on Chemical Accidents beginning on page 67. If you come from a country which is not on that list, please send your comments to:

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Conclusions and Recommendations¹

The following Conclusions and Recommendations have been prepared based on the discussions of a Workshop organised by the OECD's Expert Group on Chemical Accidents in Toronto, Canada, in May 1994. The Workshop considered whether small and medium-sized enterprises (SMEs) which produce, use or handle hazardous substances constitute a particular problem with respect to chemical accident prevention, preparedness and response; and, if so, what SMEs and other interested parties can do to improve the awareness of risks and the use of appropriate accident prevention, preparedness and response practices at SMEs. The Workshop, co-hosted by Canada and the United States, brought together more than 60 experts from 15 countries and several international organisations. Participants included representatives from national governmental authorities, local governments and emergency response agencies, industry, trade union organisations and financial institutions.

The Expert Group recognised that there is very limited statistical information on the extent to which SMEs manufacture, use, handle or store quantities of hazardous substances sufficient to create a risk of significant accidents, and on whether such SMEs have experienced a disproportionate number of accidents. There was recognition, however, that SMEs are less likely to have the same access to information, expertise, and other resources related to chemical safety available to larger companies. Furthermore, it was thought that SMEs might present a particular risk since they are often located in or near populated areas.

SMEs of concern are those that produce, use or handle chemicals in quantities or under conditions that could pose a risk to workers on-site, the surrounding community, property or the environment. Of particular concern are those SMEs located in populated areas where injuries and deaths could result from a chemical accident. For the purposes of this discussion, most SMEs are users of chemicals or producers of specialised products.

The Workshop participants recognised the cultural differences existing among countries. They also recognised that regulatory frameworks, including the degree of control exercised by public authorities, and the balance between regulatory and voluntary programmes promoting safety, vary between countries and regions. It was noted that a regulatory structure containing basic prevention elements helps to maintain a level playing field and to minimize the adverse trade impacts of chemicals control measures.

Those taking part in the Workshop confirmed that the OECD Guiding Principles for Chemical Accident Prevention, Preparedness and Response apply to all enterprises that pose risks of chemical accidents, including SMEs. The Guiding Principles cover safety programmes and the roles and responsibilities of industry, public authorities, employees and other stakeholders with respect to the prevention of accidents involving hazardous substances, as well as preparedness for and response to such accidents. One basic question discussed was

¹ A French translation of these Conclusions and Recommendations is available from the Environmental Health and Safety Division, OECD Environment Directorate, 2 rue André-Pascal, 75775 Paris Cedex 16, France.

how SMEs can be made aware of the Guiding Principles, and what actions can be taken to assist SMEs in implementing them. The participants also acknowledged the importance of co-ordination among regulatory and enforcement authorities, in order to minimize administrative burdens on SMEs to the extent possible.

A. Introduction

1. Industry has an obligation to operate safely. This applies equally to small and medium-sized enterprises (SMEs) as well as to larger enterprises. This needs to be recognised not only by producers of chemicals, but also any enterprise that uses, handles or stores hazardous substances, including private and public entities.
2. Studies, reviews of accidents, and the results of inspections or audits indicate a variety of problems occurring in SMEs that could lead to accidents. These may include: lack of a risk or hazard evaluation; lack of documentation on process design; inadequate operating procedures; antiquated equipment; lack of maintenance; insufficient labelling of chemicals; and understatement of risk. This may indicate that in certain cases regulatory and voluntary programmes may not have been fully effective in reaching all SMEs and conveying to them the importance of taking safety precautions.

B. Characteristics and strengths of small and medium-sized enterprises of concern

3. Small and medium-sized enterprises (SMEs) are a large sector of the world economy. As such, they are key factors in economic development and the creation of jobs.
4. As a general matter, the term "SME" is often defined by the number of its employees. However, size as defined by number of employees is not the most important factor in considering which companies should be targeted for purposes of policies and programmes related to improving chemical safety in SMEs. It is more valuable to look at the structure of the company. SMEs, for this purpose, tend to be those companies that can be managed by less formal business structures (although medium-sized enterprises may have more formal structures), and those where the chief operating officer does not report to any higher management. For SMEs of concern – those that pose the risk of a chemical accident – it may also be useful to categorise them by the level of risk posed and address them accordingly. Methods are available to categorise SMEs in relation to the kinds of activities and the risks (to the public, workers, environment and property) they pose. It would be useful to distribute these methods to all countries.

5. SMEs share certain characteristics and commonalities:

- The operating structure of SMEs tends to be less formal than those of larger enterprises; they do not share the organisational and bureaucratic complexities common to larger enterprises. Often they do not have intermediate supervisors. They may not commit to writing company policies and operating procedures.
- The SME event/impact ratio is higher than for larger enterprises, i.e. they could go out of business as a consequence of a serious accident.
- SMEs are generally known in, and are integral parts of, their local communities, although they are not always recognised as posing risks.
- SMEs often rely upon local authorities, e.g. fire services, to be the major source of their information and guidance regarding safety, although they may be suspicious of some public authorities.
- SMEs often rely in large part upon suppliers and job experience for training and education and other information concerning the hazards of hazardous materials.
- SMEs often employ few engineers. The engineers on staff generally fulfil multiple engineering and other functions. SMEs generally do not have specialised loss prevention staffs. They are less likely to have systematic control procedures or updated technology than larger companies.

6. In general, SMEs have many strengths that can be used to enhance and promote chemical safety management:

- SMEs want to be good corporate citizens. They are members of the community and as such want to do what is necessary to ensure the safety of their workers, their families, the community at large, their property, and the environment.
- They have personal relationships with peers and they value their reputation among them.
- If management in an SME is committed to a course of action, e.g. safety improvements, they can influence and motivate the whole company. This is particularly true if the direction comes from the top, i.e. from the owner/CEO of the company.
- Their size allows for an in-depth knowledge of the facility by management and workers.
- SMEs are more likely to have open communication channels (e.g. direct communication of all employees with the owner/manager of the facility).
- When something goes wrong, accountability is identified rapidly.
- Because of their size and less formal structure, SMEs can implement change quickly.

7. SMEs may be prevented from achieving the goal of safety for several reasons:
- SMEs may not be aware of the fact that they are handling chemicals which pose a risk of an accident that could harm health or the environment. Major accidents which harm an individual enterprise or the community do not occur frequently. This in itself may contribute to a false trust that an accident will not happen in their facility. This may contribute to a casual attitude about handling chemicals.
 - They may not know that they need to make changes to their operation in order to ensure safety. They may lack knowledge of chemical process safety management and other technical information on emergency preparedness, prevention and response. They also are not always aware of applicable laws, regulations and policies. They may not know where to go to get information. Rarely is there only one source of information for all needs, and information received may not be easily utilized or may be unreliable.
 - SMEs often need financial or other assistance to implement safety programmes. They usually do not have a large reserve of cash available if needed, nor do they have other technical and informational resources that are available to larger facilities. Furthermore, they may not understand the full costs associated with operating in an unsafe manner, i.e. without appropriate safety systems. They could incur costs of lost work time, damages to equipment and the enterprise's property, and clean-up, as well as harm to the community and the environment.
 - Cost of compliance with regulations can be significant for SMEs. Also, they may have little time to keep up with paperwork requirements and learn about the latest regulatory developments. Many are overburdened with regulatory and paperwork requirements.
8. The characteristics of SMEs described above are also at least partly applicable to larger enterprises that are being created or reorganised in countries with economies in transition, enterprises in developing countries, and smaller installations of large corporations anywhere in the world.

C. Benefits of good safety practices: learning from good examples

9. Experience has shown that there are clearly both tangible and intangible benefits to the application of chemical process safety management approaches by SMEs. There is a high return on investment in safety. Preventing accidents saves money, allowing for higher profits and improved efficiency of operations. The environment is protected. An added value is an improved relationship with the public, and maintenance of a good reputation and image in the community and within the industry.

10. SMEs with successful safety programmes recognise these benefits and the importance of integrating safety considerations into their whole operation. They increasingly recognise that safety makes good business sense and is often a consideration of potential customers and suppliers. They are aware of the causes of accidents and their consequences for the facility and the community. They understand the implications of safe operating practices for employee morale. They not only make the effort to comply with government regulations and policies, but they understand the value of and need for a continuous safety improvement process.
11. A number of elements contribute to successful chemical safety programmes. The importance of *attitude* was stressed, recognising that there must be management commitment to safety and that safety requires a constant effort integrated into the overall management of an enterprise. In addition, safety requires *co-operation* among all relevant parties, with policies and programmes involving all employees. There should be a *company policy* on safe operations with the establishment of safety objectives, and there should be appropriate *education and training* programmes. A number of additional elements were described as contributing to a successful approach to safety, including:
- dedicated teamwork, camaraderie;
 - a philosophy of looking to the future;
 - safety committees composed of representatives of employees and management;
 - seeking of information and assistance from a variety of reliable sources which could include suppliers, government authorities, trade associations, trade unions, and publications;
 - networking with other representatives from other facilities, and pooling of resources to produce useful tools and provide a means of sharing the burden of lobbying and communicating with those outside the industry;
 - becoming members of trade associations and working with them and/or in industry-government partnerships;
 - audits (self-audits or audits by outside experts);
 - integration of safety with (process) quality assurance systems;
 - an award system, providing positive feedback for safety;
 - hiring of people who have had experience with larger enterprises;
 - incident investigation, taking advantage of lessons learned; and
 - a good relationship and proactive work with the local community.

12. It was recognised that there is a variety of information and tools available to assist SMEs in learning the importance of safety considerations. For example, numerous industry, professional, government and other organisations have developed guiding principles and operating criteria, process and storage safety checklists, chemical dispersion charts, risk assessment guidelines, and chemical process safety training materials. Pooling of information and expertise is an effective and efficient way to develop needed information and "how-to" tools.
13. Recognising the limited time and resources available to SMEs, to be effective information and guidance materials should be simple, limited to that information which is really important, and focused on actions which should be taken. Therefore, the providers of this information and these guidance materials should simplify them to the extent possible, and present them in a succinct, clear and easy-to-read manner. It is also most effective to provide this information and these services on a local level. Which party is best placed to provide this information and guidance should be taken into account based on the competence of, and resources available to, the providers.
14. When workshops, seminars, and informational meetings are part of technical assistance provided to SMEs, the provider should take into account the limited time available to managers of SMEs and plan them at times that accommodate their schedules, e.g. evenings. Providers of such information and services should constantly evaluate their effectiveness and usefulness for SMEs.

D. Actions which can be taken by stakeholders

15. Providing assistance to SMEs should be a collective effort. A variety of entities can provide incentives, information, and technical tools. They include: other enterprises, including suppliers, public authorities, trade/industry associations, multi-stakeholder groups, industry self-help organisations, industry-government partnerships, safety commissions, professional organisations, labour unions, educational facilities, and the media. A multi-faceted approach is needed in which a variety of entities and programmes may be necessary in order to address the various concerns and limitations of SMEs. In this regard, it should be recognised that peer groups are considered to be important sources of information.
16. The establishment of partnerships among enterprises in a region or within a particular sector is particularly valuable in finding ways to obtain information to improve safety systems and in influencing decision-makers. Each party should contribute fully to these endeavours. Networking is extremely valuable in sharing information.
17. Providers of information should determine the best ways of packaging the information (based on target audiences) and the best channels for disseminating the information. For example, these decisions may be product-based or customer-based.

Creative means of reaching SMEs which are outside the normal network should be found. Examples described included the use of local (city) business licensing offices or tax rolls. It should be recognised that SMEs are more likely to join locally-based organisations or groups, where their customers are likely to be found. SMEs are often unable to travel long distances to participate in relevant activities. Therefore the importance of local networking was stressed, and the use of new technologies such as tele-conferencing and electronic bulletin boards was suggested.

18. Efforts should also be made to increase awareness of the profit-related advantages of improved safety practices, and to increase demand for products and services from responsible companies.

Public authorities at various levels

19. Governments should establish legislation as needed, and public authorities should provide a regulatory framework and objectives regarding accident preparedness, prevention and response where this has not already been done. These frameworks should allow flexibility for companies to determine the best means of achieving these objectives, to benchmark best management practices, and to come into compliance with the law. Further, they should provide clear, easy-to-understand guidance on how these regulatory objectives can be met by SMEs.
 - Public authorities should consider tiering requirements for SMEs in proportion to level of risk. In order to accomplish this, public authorities may have to gather information about and from SMEs.
 - A continuous dialogue between public authorities and SMEs is necessary to ensure that regulations promulgated will be applied and ultimately will improve safety.
20. Public authorities should develop and maintain a simple and consistent regulatory system. They should harmonize regulations among various national and local authorities, to the extent possible, and eliminate duplicative requirements. They should make an effort to ensure that interested enterprises receive notification of any changes in legislation or reporting requirements. In this respect, establishment of partnerships is helpful.
21. Public authorities should guarantee equal treatment of all industry, establishing a level playing field. Safety regulations and guidelines should not be different for SMEs than for larger enterprises. However, regulations and guidelines should be implemented by an informal organisational structure. Concern was raised that existing legislation and regulations, as well as government programmes, are biased towards larger organisations. This obviously should be avoided. The criteria for SMEs and larger enterprises should be the same, but the means of implementation may vary for different sized enterprises.

22. Public authorities should co-ordinate among themselves to ensure that regulations, guidance, and technical information provided to SMEs is complementary, not duplicative or contradictory. They should be careful to ensure that facility visits, inspections and audits are co-ordinated to minimise the burden on the SME.
23. Public authorities should limit paperwork/reporting requirements applicable to SMEs, focusing on those which are valuable for identifying risks and the means for dealing with them, or which are necessary for government functions. Paperwork is a particular burden for SMEs. It is recognised, however, that in the process of creating prevention and emergency plans a business can learn the most, and that written information is particularly important when interactions are necessary among employees. It can be particularly dangerous to rely on personal knowledge during the stress of emergency situations, which may occur during non-working hours. It was also recognised that there must be some consistency in information provided by all enterprises that pose safety risks, which can be used by public authorities and citizens. Like SMEs, public authorities also have limited resources.
24. Public authorities can contribute significantly to the improvement of safety programmes in SMEs in other ways. They should increase activities which promote assistance to SMEs without threat of prosecution. In this regard, they can:
- provide mechanisms for SMEs to voice their concerns about regulations and suggest alternative or tiered approaches, e.g. using ombudsmen, advisory committees and/or local information-sharing forums;
 - provide one-stop shopping for relevant information and technical assistance, i.e. through information centres and toll-free telephone lines;
 - provide guidance and technical tools such as certified audit programmes and checklists, including information on total quality management and on the use/availability of qualified consultants. They can finance assistance activities or promote volunteer service for use by SMEs;
 - assist SMEs in promoting safety by providing feedback based on experience, and databases, and publishing technical issue papers, e.g. on risk analysis and preventive measures;
 - promote the use of voluntary safety improvement activities which go beyond the regulatory requirements;
 - provide information, education and training for SMEs; and
 - provide information to the public.

It should be noted that, in order to be successful in these outreach efforts, public authorities should ensure confidentiality to the SME in search of assistance within the limits of the law.

25. Public authorities can sometimes provide SMEs with financial incentives, e.g. tax savings or guaranteed loans for improving safety and for installation of safety systems. Direct financial support may be provided by public authorities to install safety equipment and establish safety programmes, including the creation of infrastructures. This may be especially useful in areas of industrial depression. Public authorities can encourage innovative approaches, such as establishing loan programmes with a percentage of fines collected from non-compliance. Financial incentives should be kept under careful control to maintain a level playing field.
26. Public authorities should consider, if possible, the establishment of "Good Samaritan" laws where needed, to encourage industry and other stakeholders to provide assistance to SMEs in order to promote safety without fear of liability.
27. Public authorities also can play an important role in physical land use planning and relocation decisions regarding both the location of industrial activities and community residences with respect to the risk of chemical accidents.
28. Local government authorities are particularly well-placed to establish partnerships with industry, with the aim *inter alia* of improving overall chemical safety.

Larger enterprises

29. Larger enterprises can provide significant assistance to SMEs, sharing their experience and providing guidance and assistance to suppliers, customers, contractors and others with whom they have business relationships. They can also reach out to other SMEs through regional activities or indirectly through industry/trade associations, professional organisations, etc.
 - Larger enterprises should act as "stewards" for SMEs, consistent with the Product Stewardship principles adopted by many chemical industry associations.
 - Such enterprises (and more sophisticated SMEs) can act as mentors to local SMEs.
 - They can work with subcontractors to ensure loss management control capability, creating long-term, mutually beneficial relationships if possible.
 - They should provide information on chemical safety to appropriate contractors, customers and suppliers, without waiting for requests.
 - They should devote their time and expertise to the development of useful technical tools, working through industry-government partnerships and trade associations.
 - They should participate in industry-led safety initiatives such as Responsible Care.
 - They should work with governments to ensure sound, implementable regulations.

30. Suppliers and distributors of chemicals (irrespective of size) are key components in the information channel to SMEs. They should be encouraged to provide education, training, information, and other services related to risks and safe handling of chemicals to their customers voluntarily.

Workers and their representatives

31. Labour unions at all levels are important providers of information and education and training programmes directed to improvement of chemical safety. These services are provided to members and non-members alike, both in developed and developing countries.
32. Workers and their representatives are important partners with management in promoting chemical safety. They should participate fully in safety committees and other safety organisations. In this regard, it was noted that safety considerations would be better served by their elevation above the narrow bargaining process of the social partners.

Trade associations and professional/standards organisations

33. Trade associations and professional/standards organisations are a critical source of guidance, consultant services, and other technical tools, providing a mechanism for channelling the collective experience of their members towards the development of practical materials which can be made available to both members and non-members.
34. Such associations and organisations should make a special effort to reach out to SMEs in order to raise awareness and understanding of safety-related issues and encourage participation of SMEs in their efforts. In this regard, they should make information and other resources available to companies in other industries (e.g. to distributors and users of chemicals).
35. Associations and organisations should focus on sorting through the extensive materials available to identify those that are particularly helpful, and to simplify information using practical examples. Trade associations and professional organisations can be particularly effective in developing "how-to" generic approaches for specific industrial sectors.
36. Activities should be planned at regional levels to promote wider participation by SMEs.
37. Professionals who are not safety-related such as accountants and attorneys, and their associations, can also be helpful in communicating with SMEs.

Financial and insurance institutions

38. Financial institutions can provide business improvement loans that stress the integration of safety concerns into the business operation. Although banks are concerned with repayment of loans on agreed-upon terms and with minimised liability, they can assist SMEs by utilising special programmes, e.g. where the government provides some guarantee to the loans, considering a policy of no personal guarantee. Consistent with their business needs, banks can provide direct customer services in these areas, e.g. through the establishment of ombudsmen. Banks can also provide a unique perspective on SME concerns to regulators as regulations are developed.

39. It was recognised that the insurance industry is limited in the assistance it can provide to promote chemical safety in SMEs. Many SMEs are unable to obtain environmental liability insurance and, in any event, SMEs do not generate sufficient premium for insurers to encourage them to conduct detailed inspections by specialists. However, insurance pools have recently been formed to ensure against environmental risk, which may be of use in the future. Insurance companies also may have information on accidents and their causes which could be shared with other stakeholders for use in the development of guidance and "how-to" tools.

Consultants

40. External consultants and volunteer services can provide valuable assistance to SMEs, providing expertise which is not available from within the company. In this regard, they can provide multidisciplinary and specialised expertise. Independent organisations, as well as independent consultants, often are seen as neutral parties and their advice may be taken more readily. No-fee volunteer services may be particularly useful to SMEs. It should be noted, however, that it is important that any knowledge about safety processes and programmes provided by consultants be inculcated into and accepted fully by the company and its employees where appropriate. Safety is ultimately the enterprise's responsibility, not the consultant's.

Academia

41. Universities and educational facilities can provide information and training on safety for SMEs, and can do research that benefits them.

Multi-stakeholder groups

42. Multi-stakeholder groups have proven to be an effective means for developing and disseminating practical, consensus-based approaches which are easily accepted by all parties. They can provide an important source of information, from a variety of sources, and a means of keeping current with new information on safety. These groups can be organised at a local, as well as at regional and national levels. Health professionals, hospitals, and poison information centres can be key components of these groups.

43. Such stakeholder groups have been successful in identifying areas/installations of concern. Because of their broad-based membership, they are well-placed to raise awareness of safety issues and to educate and advise on how to improve safety programmes.

Press and telecommunications industry

44. SMEs receive information from the news services. The press and television can promote safety considerations and recognise contributions of SMEs. Often local news services are looking for newsworthy items. Cases where public authorities and SMEs are in partnership can be newsworthy given the often rigid, bureaucratic view of government.

SMEs

45. SMEs themselves have certain obligations. Several actions which should be considered by SMEs were identified in Part C above. These considerations should take into account the advantages and strengths of SMEs mentioned in Part B, national expectations, and the degree of hazard involved. It should be emphasised that SMEs need to:
- recognise the importance of safety as an integral part of their business operation and commit themselves to safe operations. In this regard, they should be proactive in planning for safety and setting objectives rather than solely being responsive to perceived problems;
 - evaluate risks of their operations and maintain continuous reviews. If necessary, they should consider conducting risk or hazard analyses to identify problems;
 - actively seek information on safety;
 - establish safety committees or some other mechanism composed of management and workers or their representatives to promote dialogue within the business on safety;
 - enter into partnerships with public authorities and other enterprises to work towards safety improvements in their communities and obtain the information and training needed to improve safety;
 - enter into partnerships with other enterprises to form "mutual aid" response groups so that limited resources can be pooled and shared when chemical accidents occur. SMEs should seek the assistance of public authorities to assist in the establishment of such "mutual aid" groups;
 - enter into mutually beneficial relationships with suppliers and customers and welcome offers of assistance and audits from them; and
 - join professional organisations.

E. Future work

46. The OECD should mount a strong effort to gain representative ideas and guidance from SMEs and to validate the conclusions and recommendations from this Workshop with them. Recognising that the concerns raised at this Workshop are continuing ones, the problems and issues of SMEs should be addressed in future OECD Workshops that are topical in nature. One example could be linking quality management to safety promotion at SMEs. Representatives from SMEs and other stakeholders should be identified and invited as participants. This should include representatives from both developed and developing countries.

47. All interested parties should continue to review activities in this field and, in particular, to seek to determine whether information/services are actually reaching the target audiences in OECD and non-OECD countries and whether they are being effectively utilized by the SMEs. If they are not, all parties should identify steps that could be taken to improve communication with SMEs and to assist them in the use of information on safety.

REVISED DISCUSSION DOCUMENT

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1.0 Introduction

The intention of this (revised) Discussion Document is to provide a framework to deal with the complexities of interacting with small and medium-sized enterprises in the domain of chemical accident prevention, preparedness and response. This framework was originally intended to help in setting the stage for possible discussions during the OECD Workshop. It does not claim to be definitive or all-encompassing, and it may be necessary to add to it or modify it as a consequence of Workshop discussions. This document does not necessarily reflect the views of the OECD or its Member countries.

1.1 Background and content

The OECD *Guiding Principles for Chemical Accident Prevention, Preparedness and Response*, published in 1992, is a guidance document intended for public authorities, industry, labour, and other relevant parties. Its purpose is to assist these "stakeholders" in establishing programmes and policies related to the prevention of, preparedness for, and response to accidents involving hazardous substances. The Guiding Principles document grows out of recommendations made in a series of OECD Workshops held between 1989 and 1991. These Workshops addressed a range of issues associated with hazardous materials accidents and considered the roles and responsibilities of such relevant stakeholder groups as government authorities at all levels, management and employees at hazardous installations, and the potentially affected public. The Workshops were sponsored by the OECD entity now known as the Expert Group on Chemical Accidents.

In general, the objective of the Guiding Principles is "to set out general guidance for the safe planning, construction, management, operation, and review of safety performance of hazardous installations in order to prevent accidents involving hazardous substances and, recognising that such accidents may nonetheless occur, to mitigate adverse effects through effective land-use planning and emergency preparedness and response."

The introduction to the Guiding Principles further states that within the context of the document, "the word 'safety' embraces health, safety and environmental protection, including protection of property, to the extent that they relate to the prevention of, preparedness for, and response to accidents involving hazardous substances."

The Guiding Principles are written in a broad way to provide objectives in prevention, preparedness and response, rather than specific means for achieving those objectives. They are intended for application worldwide, irrespective of location or size of facility, and their focus is on fixed facilities of all types that produce, process, use, handle, store, or dispose of hazardous substances.

One important subset of these facilities is the SME group, or small and medium-sized enterprises. In the Guiding Principles, explicit reference is made to concerns and interests of SMEs in regard to nearly a dozen particular issues. The specific recommendations that refer to SMEs, however, are only a first step in identifying and addressing SME issues. While the Guiding Principles acknowledge that SMEs that produce or use hazardous substances may pose special problems or may need special considerations, the document leaves the question of guidance for implementation to future OECD efforts such as this SME Workshop.

The intent of this paper, and of this Workshop, is to take the next steps in directly addressing SME issues and, more specifically, determining techniques and methods to help SMEs improve their chemical safety practices and disseminating the information to them for practical application.

1.2 The ultimate goal

The Guiding Principles make it clear that small, medium-sized, and larger enterprises that use hazardous substances in any way should operate to the same safety standards for similar risks. Among the ultimate goals is that the elements of good safety practice become so widely known that all owners and managers of hazardous installations are informed of these practices, understand them, and apply them in the safe operation of their facilities. This includes SMEs.

1.3 The current situation

A study by the United States Environmental Protection Agency (US EPA) described the situation of SMEs in the chemical industry in that country. Entitled "Review of Emergency Systems" and published in 1988, the document was prepared as a requirement of the Emergency Planning and Community Right-to-Know Act. One of the findings in its text states: "In general, the larger chemical producers appear to have a better awareness of hazards and risk management and implement more release prevention techniques and technologies than do the smaller producers, users, handlers, and distributors." The text of the report continues: "This does not mean that some smaller companies do not have adequate systems for preventing releases, but rather, that they appear less aware of the potential for significant releases and the associated prevention methodologies available. It is generally accepted that the smaller companies may not have adequate resources to install the latest prevention technologies; some may consider their inventories insufficient to warrant using the technologies. Many of these companies appear to lack an understanding of formal hazard evaluation techniques. The management commitment of the smaller companies, as demonstrated by participation in industry and community programmes, also appears to be lower than that of the larger producers."

The US EPA's study reflects only one government agency's viewpoint in examining safety practices at SMEs. Concerning the measurement of management commitment to safety, for example, external activities are only an indirect indicator. For instance, if SMEs do not participate in industry or community programmes, it may not mean that a given SME's management is not committed to safety. It may indicate that management is committed to safety but is not aware of industry and community activities. Or that management, with its limited resources, is participating in other activities elsewhere, such as local colleges and professional societies.

While there may not be a wealth of information available describing the SME situation in other countries, it is probably safe to imagine that the situation in other industrialized democracies is not very different from that in the US.

In industrialized countries a reasonably proficient information network is already in place that ensures exchanges of information among government, large chemical manufacturers, and other key stakeholders, usually through the medium of active trade associations as well as through professional societies. Results of research can also be communicated through these societies – at annual meetings and in journals. Most of the participants in this information exchange network are easily identifiable, and the necessary communications infrastructure of distribution lists, fax lists and so on is well worked out and up to date. Large chemical manufacturers are often not only current with the latest developments in government regulations, but are occasionally ahead of the "curve," implementing government programmes before they become requirements. By the same token, large manufacturers can often be initiators of safety information that leads to codes and standards.

Many smaller chemical manufacturers can also be reached with safety information to varying degrees by trade associations, government authorities, professional societies, and other entities. On the other hand, the users of hazardous chemicals, whether small, medium-sized or large, as opposed to manufacturers, are often less well informed. The management of many such enterprises often has minimal understanding of process safety. It is especially this audience that should be reached and convinced of the benefits of operating more safely.

For responsible stakeholders in chemical accident prevention, preparedness and response, the task is to ensure that all SMEs are "in the safety loop" to the degree appropriate for each SME's hazards and risks.

1.4 Purposes of the OECD Workshop

The purposes of this OECD Workshop were to examine SMEs that manufacture, store, process or distribute hazardous chemicals, or use them in any other ways, and through this process to:

- determine whether SMEs constitute a special prevention, preparedness and response problem in terms of the level of risk they may pose of an accident with potential adverse effects on public health and the environment;
- define the parameters of the problem by examining strengths and limitations of SMEs;
- identify realistic ways of addressing the problem(s) by recommending roles and responsibilities for all involved parties and proposing actions appropriate for each group.

The ultimate goal of this activity is to bring SMEs into the process of improved prevention, preparedness and response; that is, to:

- improve their awareness and understanding of appropriate safety practices;
- ensure that safety management is an integral part of their operating perspective;
- improve the actual safety of their operations.

Most of the large, serious chemical accidents that have created fear on the part of the public have been associated with large organisations – some private, some public. Examples include Bhopal, Seveso, Flixborough, Phillips, EXXON Valdez, and many others. SMEs have, of course, also had accidents, but they have generally been of a smaller scale with smaller effects. It has sometimes been alleged that since some small operations may be less informed, they are thus more likely to present a threat than large operations; however, this is a debatable premise that is not borne out by weight of evidence. What is important to consider is that the number of SMEs in operation is vastly greater than the number of large chemical manufacturers, and the cumulative risk of many smaller installations cannot be ignored. At this stage, there is simply not enough information available to assess realistically the level of risk represented by SMEs.

It is perhaps more useful to start from the premise that a hazard of a given size and nature should be managed safely regardless of the size of the enterprise. Then, by focusing on the strengths and weaknesses of various types of enterprises, it is possible to consider ways to help all types of enterprises operate safely. In other words, for best results, the safety strategy should suit both the nature of the risk and the nature of the enterprise.

The initial premise of the OECD Workshop was that SMEs do present a problem of some kind. One challenge was to define the nature of that problem. The consensus of the Workshop at its conclusion was that SMEs individually do not pose a special safety problem. However, because of the large number of SMEs in operation, they should not be overlooked since they may not be well informed about good safety practices. The "problem", then, was seen to include many subsets of problems:

- information and access to information;
- attitude or mindset;
- hazard identification;
- management of change;
- hazard reduction;
- training;
- preventive maintenance;
- standard operating procedures;
- accident investigation;
- emergency planning;
- community relations.

The more fundamental question then became, how do stakeholders such as public authorities, larger enterprises, trade associations, labour organisations, public interest groups, and so on relate to SMEs? And what can they do to help SMEs operate more safely?

1.5 Products/outcomes of this Workshop

The objective of this Workshop was to develop practical guidance to deal with SME issues in chemical safety. One method may be to use the conclusions of the Workshop to develop a guidance document for stakeholders that shows *how* they could apply the Guiding Principles to SMEs and "reach" SMEs effectively. Another method may be to develop a supplement to the Guiding Principles. Workshop participants advised first validating conclusions through some direct contacts with a cross-section of SMEs before proceeding.

1.6 Initial recommendations

The Workshop considered a broad spectrum of questions relating to SMEs and chemical safety. These questions may be summarized as follows:

- What are the differences between smaller and large enterprises?
- What are the differences between manufacturers and users/handlers of hazardous chemicals?
- What advantages do SMEs have?
- What constraints in resources and other areas must they overcome?
- What can SMEs do to strengthen their safety programmes?
- What can large enterprises learn from SMEs?
- What can SMEs learn from large enterprises?
- What can public authorities do to help SMEs improve safety?

Many of the questions grow out of recommendations made initially in the OECD Guiding Principles with explicit reference to SMEs. These are discussed below, with commentary resulting from the Workshop.

- The Guiding Principles state that larger enterprises, trade associations, insurance firms, suppliers, customers, public authorities, and others should help SMEs meet safety objectives. Incentives should be explored to motivate stakeholders to take an interest in the problem. This issue should be discussed in more depth to generate additional ideas.
- The Guiding Principles state that the control framework used by public authorities "should allow flexibility in methods" SMEs use "to meet safety objectives and requirements." Some areas where this flexibility may be exercised are screening of risks, tiering of risks, simplification of regulations, consultation programmes (separate from enforcement), and the use of enforcement only as a fall-back.

- The Guiding Principles recommend simplifying regulation/reporting requirements. During the Workshop, participants agreed that regulations and reporting requirements need to be simplified; however, additional discussion should be held on possibilities of implementation.
- The Guiding Principles note that, to assist industry in improving safety at hazardous installations, public authorities should consider whether to undertake such additional activities as:
 - provision of technical assistance, considering any specific needs of SMEs;
 - promotion of training programmes;
 - encouragement of research;
 - fostering of public awareness.

While there was consensus on these recommendations during the Workshop, concepts for development and implementation must first be generated.

- According to the Guiding Principles, "SMEs with limited resources should examine the need for assistance on safety matters from external consultants, professional/trade associations, and public authorities as well as from suppliers. Suppliers of hazardous substances should be supportive by ensuring that people are available to provide advice in order to achieve an appropriate level of safety." Workshop participants agreed that suppliers should be more assertive in providing help to SMEs. The issue of liability for suppliers of information, however, was not addressed.
- For larger operations, the Guiding Principles recommend that management should... utilise auditors independent of local management and employees to monitor hazardous installations... Using... expert consultants or the enterprise's central safety services can be a valuable means... of raising safety performance by providing another, more independent, viewpoint." The Guiding Principles then go on to recommend that insurance companies may provide a useful service in this respect, especially for SMEs. The consensus of the Workshop was that insurance companies realistically can play only a very limited role. Two other means for SMEs to obtain audit services at low cost and without fear of penalty were identified: through an ombudsman's office, and through confidential consultation services.
- The Guiding Principles recommend that "public authorities should use monitoring as a means of providing support to management of hazardous installations... Monitoring provides an opportunity for public authorities to help management identify weaknesses in their organisation and in their safety arrangements, as well as to provide advice on details on where further information and assistance should be sought. This may be particularly important for SMEs." Several ideas were proposed at the Workshop: "windows of opportunity" or amnesty windows, use of an ombudsman's office, and confidential consultation services.

A broad theme throughout the Workshop was forming new partnerships as a way to achieve better results than the partners could achieve on their own.

2.0 Who are we trying to reach?

In order to address SME issues effectively, SMEs must first be defined. This section of the paper examines the definition of SMEs, first statistically, showing how SMEs figure in the work force and economy of several countries. The text then looks at characteristics many SMEs have in common and describes typical strengths and limitations.

2.1 Who are these SMEs?

First of all, what is a small enterprise? There are many definitions in use, and these definitions vary depending on the country, the culture, legal and regulatory frameworks, economic situations, and other factors. What is "small" in one country may be "medium-sized" or even "large" in another. It is important to note immediately, however, that it is not the intent of this paper – or of the Workshop itself – to consider any precise size of installation, but rather to examine enterprises that share certain characteristics relevant to safety. On the other hand, there was a consensus during the Workshop that the characteristics and needs of small SMEs (fewer than ten or 20 employees) are different from those of medium-sized SMEs (up to 500 employees).

Size

For most manufacturing industries in the United States, for example, the US Small Business Administration defines a small business as having fewer than 500 employees. On the other hand, the US Occupational Safety and Health Administration uses a definition of fewer than ten employees. Within the US synthetic organic chemical industry, 85 per cent of the companies employ fewer than 50 workers. This is not much different than the overall US economy, in which about 95 per cent of the businesses employ fewer than 50 employees and 99 per cent employ fewer than 250 employees. Again in the United States, small businesses employ two-thirds of all entry level workers, according to the Small Business Administration.

Small, technically oriented companies make quantifiable contributions to their local communities, to technology, and to the economy as a whole (see Table I). In the US, new job creation has occurred primarily in small business over the past decade. In addition, studies have repeatedly shown that the rate of technological innovation is higher in small technical enterprises than in large organisations. Sometimes a lack of resources may contribute to innovation.

Looking at Canada as another example, SMEs in that country employ 36.7 per cent of the labour force and account for approximately 40 per cent of the gross domestic product. In 1990, Canada had 934,533 firms with paid employees. 97.3 per cent of those firms employed fewer than 50 people, and 74 per cent employed fewer than five. Over the ten-year period from 1979 to 1989, SMEs in Canada created 85 per cent of new jobs.

An examination of SME figures in a country of a much different size, Finland, shows that, as of 1991, the country had 126,777 firms with paid employees. In that workforce, 63 per cent were employed by SMEs with fewer than 500 people. Further, 38 per cent of firms in Finland employ fewer than 50 people and 12 per cent employ fewer than five people. These figures represent a country with a total population of approximately 5.1 million.

The United Kingdom, with a total population of about 54.1 million, presents another perspective. At the end of 1991, the UK had approximately 2.7 million firms; of these, an estimated 1.18 million were sole traders, but the number of partnerships without employees is not known. With a work force of 28,234,000 (in 1991), 98.6 per cent of these people were employed by firms with fewer than 50 people and 85.3 per cent by firms with fewer than five people. Concerning the contribution to the UK economy made by SMEs, a series of studies shows that from 1982 to 1991 SMEs continued to generate new jobs and registered less effect from changes in the economic cycle than large firms.

Throughout the Workshop, participants agreed that SMEs are the backbone of most economies.

Shared characteristics

The number of employees is only one way to characterize a small business. One could also examine the number or volume of chemicals handled or annual sales figures. Or one could begin by listing a set of characteristics shared by SMEs, such as the fact that many SMEs are not members of a trade association network that would address issues of chemical safety. Or the fact that many SMEs would not be considered part of a list of facilities subject to inspection for chemical process safety. The OECD Workshop would have benefitted considerably from a larger representation of SMEs. Too few were in attendance to confirm broadly the apparent SME self-perception that they do not represent the risk of a significant chemical accident.

Diversity

In terms of the operating sectors, private and public, represented by SMEs that use hazardous chemicals, including downstream users of any size, they constitute an immensely broad spectrum:

- batch processors;
- formulators of paints/inks/adhesives/cosmetics and toiletries;
- printing plants;
- photography labs;
- furniture manufacturers;
- cold storage facilities;
- textile manufacturers;
- electronics firms;

- automotive repair shops and filling stations;
- commercial laundry or cleaning companies;
- plastics manufacturers;
- funeral parlours;
- metal plating and finishing operations;
- battery reclamation sites;
- fertilizer manufacturers;
- paint supplies warehouses;
- food processors and distributors;
- laboratories;
- agricultural co-ops;
- natural science museums

and scores more. These SMEs are not limited to the private sector. They can be publicly owned as well, and should be treated equally. Examples are:

- municipal or regional water treatment systems;
- public swimming pools or skating rinks;
- rail yards and bus maintenance facilities;
- public utilities;
- hospitals.

2.2 Strengths and limitations of SMEs

In contemplating safety and issues related to prevention, preparedness and response, it is important to consider the inherent advantages and disadvantages that stem from the size of an operation. This issue surfaced throughout the Workshop as a fundamental consideration whenever one examines SME questions.

It is equally important to keep in mind that there is tremendous variety among types of SMEs. Every facility is different; every facility is unique. This means that the approaches stakeholders use in dealing with these enterprises must also be varied and flexible. There can be no "one-size-fits-all" solution. To bring this into sharper focus, consider all the combinations

of the following characteristics that could describe a facility, though they may be oversimplified and certainly do not represent all the possibilities:

Size: small, medium, large

Ownership: privately owned, shares publicly traded, government owned

Activity with chemicals: manufacturing, processing, distributing, storage, other use

Storage/process pressure of chemicals: low, medium, high

Physical state of chemicals: gas, liquid

Storage temperature: ambient, cooled

Industry groups: many different sectors

Workforce: independent, unionized

Life-cycle stages: start-up, mature, declining

If one considers all the permutations and combinations of these characteristics, there are many thousands of possible SME profiles. Each combination of SME characteristics has a different point of view, and there are different interactions among different characteristics. In addition, each facility has many unique characteristics with which only the people in that facility are familiar. However, there is one thing that all SMEs (even small operations of large corporations) have in common – a shortage of one or more of the following resources essential to any enterprise:

- information;
- people (both numbers and skills);
- capital (equipment and funds; land).

The other key economic resource, entrepreneurship, is one that many SMEs have in above-average amounts. Perhaps this is a clue to keep in mind in examining the strengths and limitations of SMEs.

2.2.1 Strengths of SMEs

SMEs already possess specific strengths that can help in safety management. These were acknowledged throughout the Workshop discussions, though every company and facility is different and these generalizations are not universally applicable (see Table II). Devising activities for stakeholders to support these strengths now requires further discussion. SME strengths are presented below.

Lower potential for major accidents

Most types of smaller facilities usually have much lower inventories of hazardous substances. They also have smaller sized equipment and fewer units of equipment. Consequently, an accident is likely to have lower potential to become a disaster; within the plant, there is less chance of a domino effect after one mishap. In addition, firefighting and other types of emergency response are much easier to carry out on a smaller scale.

Smaller facilities tend to be specialised. This aids in safety planning because fewer abnormal condition scenarios must be considered, especially if the installation has materials that all present similar hazards.

Within the chemical industry, most smaller facilities are batch handlers and/or processors rather than continuous processors. This helps in limiting the scope of damage should an accident occur.

Personal involvement of management

Since management and technical personnel in the chemical industry are intimately involved in plant operations, they may, if properly informed, be able to monitor safety more closely even without the support of full-time safety specialists. They can thus help transmit safety attitudes effectively.

Corporate management is not at a distant location. It is very difficult to sit at a central corporate headquarters office and wonder whether plants located far away are keeping their people motivated to achieve safety and adhere to numerous complex policies, practices and regulations. This, in fact, is one of the problems facing smaller regional operations within large corporations.

Smaller companies are characterized by a sense of the personal and individual not found in a large corporation. This closeness is a powerful motivator for safety. It leads to a strong sense of personal ownership that colours decisions in every area of the firm's operation. Along with this goes pride, which can not only animate workers and keep morale high, but can also help create a leadership presence for the firm in the business and civic community. Questions of liability can also be dynamic forces for plant safety; the personal liability for the owner of a small firm is far more immediate than the corporate liability for a big business executive.

Direct lines of communication

In a smaller firm, the lines of communication are more direct. Workers on the plant floor often suggest to management constructive ways to improve safety, and management in turn receives feedback on whether safety procedures and policies are being followed. In a smaller operation, a worker is more likely to communicate with other workers in other parts of the facility and to be familiar with and understand the overall operation. With fewer people to co-ordinate, small organisations can adapt quickly to changes in circumstances. If a plant manager sees a hazard, he can respond to it immediately.

Motivated, dedicated employees

The "institutional memory" at smaller enterprises is often strongly maintained by a core of knowledgeable people not subject to transfer away from the operations they know.

The most important success factor in safety is the individual worker, if training programmes are current. His motivation to follow established procedures and to use his training are the keys to success. One of the frustrations in safety supervision is that workers (who would have the greatest risk if they make a mistake) are often over-confident that "it can't happen to me."

2.2.2 Resource constraints and other limitations

The characteristics discussed above point out a number of strengths particular to SMEs; however, SMEs also have inherent resource constraints that must be managed in order to have successful long-term safety programmes (see Table III).

Financial

One obvious major constraint is financial. Cash is usually tight. Even success in the form of growth creates needs for more cash. It is generally recognised that small enterprises are typically short of cash. If they are a relatively recent start-up, they often have barely enough cash to meet payrolls. If they are in economic decline or struggling to meet competition, they are equally short on cash. If they are growing rapidly, they need a great deal of cash to finance inventories, accounts receivable, and new equipment.

The current economic era puts strains on even the largest enterprises, many of which have smaller chemical-using units that share many of the needs of SMEs. There is a stubborn worldwide recession, which has increased unemployment levels in most countries. Simultaneously, there is a dramatic globalization of competition, necessitating that all enterprises concentrate resources on improving the quality of their goods and services, while at the same time lowering costs. Implementing sound safety practices can help improve overall performance in any enterprise, but one must recognise the many demands competing with expenditures on improved chemical safety. For example, if a smaller firm cannot afford insurance, it may operate without it or it may go out of business. Or if a situation of risk develops and there are no available funds to remedy it, the company may simply continue to operate without optimally reducing the risk.

Personnel

One key resource often limited for SMEs is people. In a given SME, there are only a small number of managerial and technical people, each of whom has many responsibilities that must all be handled on a part-time basis. One individual can be overwhelmed at times with multiple responsibilities normally borne by several committees or departments in larger organisations. The same people concerned with safety are often involved in other areas such as production, warehousing, customer service, sales, research, record-keeping, and so on. Operating people must handle what would be staff work in larger organisations. Full-time specialists in all the various areas clearly cannot be afforded.

This can be a problem at times, although at other times it is a benefit. Operating people may be more sensitive to actual conditions and may find more practical ways to prevent problems. Having fewer resources does not have to mean having less safety; it can mean different ways of achieving it, as long as information is available on the range of alternative approaches to improving safety and management is committed to applying that information.

Another resource constraint is the hiring and training of personnel. Even where labour is not in short supply, available job candidates may not have relevant experience or training. Or they may come from a different culture. Or speak a different language. Personnel who have to interview, hire and train such candidates for SMEs must combine this with various other duties. A serious training problem for SMEs is that in a small operation it may not be possible to assemble a group of people to be trained together. This can occur because there are too few workers in a given job category, and also if there are no backup personnel available during training. There can also be a problem for trainers to find sufficient blocks of time away from their other duties to do formal training. A smaller operation is usually run tightly enough that its management cannot afford to take extra time to provide special training.

Management's time can be channelled away from the plant's operation as time is increasingly spent on related voluntary programmes such as pollution prevention, waste minimization, and community outreach activities.

Efforts can also be diverted from direct safety supervision because of the large and increasing number of regulatory compliance programmes and record-keeping requirements, at least in the United States. These functions often occupy the time of the same supervisory personnel.

Technical information

Information is another basic resource lacking in many SMEs. There is often an on-site shortage of any technical information that could be used frequently. Libraries are small and informal. Further, in terms of plant-specific information, many SMEs do not have formal, codified standard operating procedures. In SMEs that have not yet established good safety practices, information concerning chemicals on site may not be available for local fire and emergency services – a critical point since SMEs are not likely to have on-site access to specialised response equipment in the event of an accident.

SMEs can become isolated and insular in their knowledge, particularly if there are no nearby sister plants with which to share resources and experiences. Isolation can be compounded in a small chemical batch processing facility, since each facility tends to be unique in design, product mix, operation, and so on.

3.0 Why are we trying to reach them?

At a fundamental level, any problem can be divided into two questions: What's wrong? And how can it be fixed? This section of the Discussion Document addresses that first question. The text first establishes a basis for defining "the SME problem," then breaks the problem down into principal components of information and resource allocation. During the Workshop,

participants agreed that the sheer number of SMEs in operation is a reason to ensure that they have the same safety information and knowledge that larger companies have.

3.1 Basis for defining the problem

In examining SMEs from the standpoint of safety and the way they relate to prevention, preparedness and response, *the number of employees or amount of chemicals handled or annual revenues are not the primary consideration. What must be examined first is the hazard at the facility and the potential for an accident that could have adverse effect on public health, workers, property, and the environment.* Once the hazard and risk are characterized, it is most appropriate to take into account the nature of the enterprise as it affects the operation's ability to manage the hazards and the risks.

While safety is the fundamental element in prevention, preparedness and response that must be examined in addressing "the SME problem", a body of valid statistical data has not yet been compiled on this issue. Stakeholders must decide how critical it is to determine the inherent level of risk posed by SMEs in order to devise ways to help them improve safety practices. SMEs need to be open about giving non-proprietary information to the community so the risks they pose can be understood by the whole range of stakeholders. During the Workshop, participants broadly recognised that screening and tiering of risks can reduce the burdens on all concerned.

3.2 Examination of components of the problem

3.2.1 Information and access to information

There is no question that lack of information, insufficient access to information, and underdeveloped communications are essential components of the SME problem.

In the United States, a government-sponsored Workshop in 1989 for private and public prevention stakeholders began examining SME issues, centring around communications and information. The purpose of the Workshop was to draw on the expertise of industry, trade associations, professional societies, labour, state and local groups, as well as the federal government, in identifying the best approaches for "getting the message out" to SMEs on prevention. Workshop members also discussed safety practices at SMEs and incentives to improve these practices.

The principal conclusions that the Workshop's participants reached include:

- The size of the facility or the number of employees does not determine a facility's awareness of, and commitment to, chemical accident prevention. Two factors particularly influence the degree of management commitment to safety: management's awareness of potential hazards and its understanding of the benefits of improved safety practices. The facilities most likely to be at risk were chemical users, who frequently lack information and personnel trained in chemical safety, and facilities whose primary focus is on "bottom line" concerns.

- Local groups can reach these facilities most directly and personally. Local groups can include voluntary or mandated emergency planning entities, mutual aid organisations, chapters of business or professional associations, and so on.

The conclusions of the US Workshop in 1989 were reached among a limited number of stakeholders. Discussions during the OECD Workshop indicated that a comparable perspective is valid in other countries.

3.2.2 Resource allocation

The second fundamental component linked to the SME problem is a lack of resources. In terms of safety, this deficiency is closely tied to insufficient information. There are many practices that can be instituted in a facility to improve safety that are not costly, but rather, cost-effective.

A primary characteristic of SMEs is that they are resource-limited. Historically, a given level of resource allocation to chemical safety has applied in each industry or government activity. But safety cannot be simply an add-on, an overhead expense. Plant safety is now seen as a necessary component of an overall, integrated approach to running an operation – a component that can have a marked benefit on an enterprise's bottom line. For a new facility, planning and design from the beginning with safety in mind may not require much additional resource allocation. Retrofitting existing operations, however, requires capital in terms of new processes, new equipment, new training programmes, and other areas. Retrofitting for safety may often have a quick pay-back, as when an installation reduces its inventory of hazardous substances or encloses a process so as to recycle hazardous substances instead of having to deal with waste disposal. Other actions have longer pay-back periods, but, certainly, establishing safety practices is ultimately less costly than dealing with an accident.

If society as a whole is willing to pay more for more safety, enterprises will have to pass the costs on to the public. For the most part, SMEs are willing to meet safety goals but are understandably reluctant to get too far ahead of the cost trends for fear of becoming non-competitive. The challenge is to assist them to compete safely.

The most effective motivator for greater SME participation in safety is "push-through" demand on the part of the SMEs themselves because they feel it is in their own interests (economic growth, survival, stability, or pride). They will participate by pushing themselves through the safety improvement system.

Public concern can also lead to a "pull-through" demand for greater SME emphasis on safety. Companies and government-owned entities are concerned about their public image. They will tend to be responsive to input from the public, which will pull the desired participants through the system.

However, there are practical limits to the amount of scarce resources that will be allocated by SMEs solely to improve public image. This is especially true if concerns are only being expressed by a small percentage of the public.

In examining the economics of improved safety, means of applying risk reduction are now more available and are more cost-effective; i.e. a company now gets more risk reduction for the same amount of resources as, say, ten years ago. Because of advances in technology

and economies of scale, some of the costs of safety equipment have been dropping. "Soft costs" such as engineering, consulting and training have also been coming down due to computerization and economies of scale.

Enterprises can be expected to make rational decisions about using their resources. They cannot be expected to invest in any business function (such as quality, research, advertising, safety, and so on) beyond the "point of diminishing returns." This point is determined both by the marginal costs of further investment and the marginal benefits of further investment. It is important to reach SMEs with the message that modern technology transfer now makes it economically justifiable to set higher safety goals than has traditionally been the case and that the marginal cost of safety improvements is declining.

Most firms, once they are informed and convinced of the benefits – economic and otherwise – of improving the safety of their operation, will seek out the requisite information and allocate resources for safety.

In some ways, one can see a convergence of the approaches to safety taken by large and small organisations. Small companies are seeking access to the same specialised resources available to large companies, and some are doing it in creative ways. At the same time, the large companies are seeking the direct, personal, locally involved communication style of some small companies. Some large companies are running into motivational limits to further safety improvement. Consequently, they are decentralizing responsibility for safety communications. This applies to company communications with both their workers and their communities. They are designating their plant managers as the front line leaders, supported by staff experts from headquarters. Many companies in the United States are also spinning off smaller divisions as separate companies to improve overall business unit performance – as well as to reduce liability.

With large corporations, one can currently see what may be characterized as a dual trend: a move towards centralization where overall corporate policy on environmental management, health, and safety is concerned, and a move towards decentralization to allow flexibility in implementation at various facilities. In such cases, the decentralized facilities often have to report back up to corporate management and are monitored or audited by their headquarters.

4.0 Are SMEs the only entities in this situation?

This portion of the Discussion Document begins to look at the question of analogies between SMEs and other groups of hazardous installations.

4.1 Identifying other groups with analogous problems

If defining SMEs centres around a set of shared characteristics, the next step is to examine other entities beyond SMEs that may face (or pose) the same problems. An understanding of SME conditions and problems could be applied to these groups of facilities,

and solutions to SME problems adapted for broader application. Other groups should be informed about chemical process safety:

- large downstream users of hazardous chemicals;
- subsidiaries of large corporations or multinationals;
- decentralized operations of large corporations;
- privatizing entities in eastern Europe;
- installations in industrializing countries.

All these facilities may use or handle hazardous chemicals as part of their operations. Many may be lacking in information about good safety practices. Many may have a problem of allocating resources for safety, or they may have a shortage of capital.

As one example, the strengths and limitations of larger downstream users of hazardous chemicals are in many ways comparable to those of smaller chemical companies. Larger downstream users may have lower inventories of hazardous substances, and they may need only a limited number of them for their operations. On the other hand, they also have resource limitations for process safety, rather than the more straightforward financial limitations of SMEs. Larger downstream users are also limited in terms of the information and technical skills available at the site. A critical difference between such an organisation and, for example, a small batch processor, is that the downstream user's personnel are inherently trained in fields other than the chemical industry.

As another example, small plants within large corporations or multinationals face many of the same issues as do SMEs. They may have a small staff, no full-time safety and training personnel on-site, limited budgets, severe price competition from other companies, and all the other limitations that small enterprises have. Sometimes the burden of reporting frequently to a remote headquarters can occupy management attention, and there may be time delays and uncertainties about approvals of requests for decisions and funds.

4.2 Using SME approaches/solutions for similar problems

The OECD Workshop concentrated on issues relating directly to small and medium-sized enterprises. Further discussion would be necessary to address ways in which SME solutions might be transferred to safety considerations for these other groups of hazardous installations.

5.0 What could SMEs do to improve their safety?

Reaching SMEs and convincing them to take action for improved safety means creating incentives and overcoming barriers. This section of the Discussion Document deals with these

two issues, then begins to explore the kinds of actions SMEs can initiate by themselves to move towards safer operation.

5.1 How can we increase incentives and reduce barriers?

Essentially the goal, in the broadest sense, is for SMEs to follow the OECD Guiding Principles on issues relating to chemical accident prevention, preparedness and response. The question is how the Guiding Principles could be applied to the needs and nature of SMEs without lowering the standard of safety.

From earlier work that has been carried out, as well as from common sense, a good deal is already understood about the incentives and barriers concerning SMEs and their safety practices. For example, at a US government-sponsored Workshop on smaller operations in 1989, a principal finding was that a critical tool in persuading facilities to improve safety practices is to help them recognise the economic benefits of good safety practices. Without the economic incentive, many facilities may not be interested in improving these practices.

Later, focus groups called together by public and private prevention stakeholders in the US found that incentives for safety could be financial (e.g. savings from reduced inventories) or legal and tax-related. Other incentives could include safety certification, free training, regulation "amnesty," and restructuring of insurance.

The same focus groups also articulated barriers: The principal barriers to prevention are cost and a high degree of effort. Other barriers are overlapping requirements in similar areas from different government agencies, convoluted regulations, and unclear or unstandardized chemical information from suppliers.

During the course of the OECD Workshop, discussion covered a number of incentives that were proposed as seed ideas to help encourage plant safety among SMEs:

Public authorities

- tax incentives for risk and pollution reduction expenditures;
- reduced permit fees for SMEs;
- longer phase-in periods for regulatory requirements;
- audit/inspection "amnesty";
- on-site technical assistance at no cost, with no penalty;
- low-cost training programmes.

Industry

- expanded product stewardship programmes;
- on-site technical assistance to suppliers and customers;
- invitations to training programmes at larger enterprises.

Trade associations/professional societies

- reduced membership fees;
- tuition assistance or reduced tuition to training programmes;
- reduced costs for texts and printed materials.

Insurance/finance

- lower insurance premiums for safer operations;
- penalty-free safety auditing services;
- more accessible safety improvement loans.

Note: This is a high-leverage idea that could benefit from government financial support through guarantees, development loans, and so on.

Labour organisations

- no-cost or low-cost training programmes

Business community

- invitation to join business or civic associations to increase the network of contacts

For SMEs to respond to incentives for safer operations, they must clearly understand what the benefits are. In the broadest perspective, improved safety can help:

- integrate safety and environmental performance into the mainstream of business operation;
- comply with future health and safety and other environmental requirements;
- avoid inflexible regulation;

- respond to current and future public awareness;
- manage environmental compliance costs;
- improve understanding of safety liabilities and risks;
- reduce safety/environmental liability;
- increase profitability;
- improve operating efficiency;
- increase employee morale;
- improve community relationships.

5.2 Actions SMEs can take to improve safety

While there is a certain percentage of SMEs who are well informed about safety and who actively carry out good safety practices, there is a much larger percentage that are still uninformed. Workshop participants generally felt that this large body of SMEs would be receptive to safety messages and willing to adapt their operations to safer practices if this could be done easily and cheaply and with obvious benefits.

Establishing channels for information

The average SME, even if it is not a member of a trade association, is already familiar with a number of entities that could serve as information channels for safety: chambers of commerce, business or industrial or civic associations, suppliers and customers, state or federal government agencies, competitors and peers. A well structured communications strategy could also help SMEs get assistance/information from: technical libraries, professional societies, research institutions, community colleges, commercial or trade publications, commercial training services, and many others. More enterprising SMEs could establish their own trade associations or mutual aid councils if none already exists to serve them. They can also establish informal networks. For example, in many areas of the US, local plant managers keep in touch with each other without actually organising a formal association. These networks may be a means of reaching out to SMEs and especially to downstream users of chemicals.

Augmenting resources

There are many ways resource-limited organisations can augment their expertise, especially from external sources (see Table IV). The challenge is to select a cost-effective combination and to integrate the external resources intimately into the company's internal programmes. These outside resources can include trade associations to share ideas, experience and costs, technical consultants for up-to-date expertise, supplier firms, government publications, and other SMEs having similar needs and resources.

Involvement with local planning officials

It is also desirable that SMEs become involved with the local officials through such groups as the Local Emergency Planning Committees in the United States, APELL (Awareness and Preparedness for Emergencies at the Local Level) groups under the United Nations Environment Programme, or LAMP (Local Accident Mitigation Plan) groups set up by the World Environment Center. Despite their smaller size and limited resources, certain types of SMEs in some communities may actually represent the greatest local source of expertise. For example, small fire departments often rely on local industries for advice, assistance and expertise that it and other local government entities are lacking. This type of co-operation should be encouraged.

SMEs should co-operate actively with government agencies who share responsibility for emergency prevention and response, providing information about the identity, amount and location of hazardous substances they have on site. At the local level, emergency response officials need to have a dialogue with each facility – small, medium-sized or large – that has the potential for a serious chemical release in order to be mutually prepared to deal with emergencies. Many SMEs who are users, not producers, of chemicals are not easily identified by emergency response officials because their primary activity is not clearly chemically-related. For this reason, it is desirable that the facilities themselves be concerned and informed about safety issues, and that they reach out to their communities.

Activity in trade associations

SMEs should become as active as possible and affordable in trade association activities. They should "pay their dues" with a proportionate share of the hard work ("sweat equity") as well as the financial costs. If trade associations are not available, they should join forces and encourage formation of associations or affiliates of already established associations.

SME managers, in their involvement with safety, must be knowledgeable enough to balance internal resources with an affordable amount of outside expertise – affordable because the costs of technical specialists, association participation, and so on can be a heavy burden on a small enterprise. To achieve this balance, they must possess an increasing breadth and depth of knowledge.

6.0 What actions can stakeholders take and what roles can stakeholders play to facilitate safety improvement in SMEs?

The preceding section of this paper examined some actions SMEs can take to improve their own plant safety. This portion of the paper covers actions that other stakeholders can take to help SMEs achieve that safety goal. The text deals briefly with a range of stakeholders: public authorities, larger enterprises, trade associations and professional societies, labour organisations, public interest groups, and SME peer groups.

The Guiding Principles state that larger enterprises, trade associations, insurance firms, customers, public authorities, and others should help SMEs meet safety objectives. However, these diverse stakeholder groups need to be motivated to take an interest in improving safety for SMEs.

The ability of stakeholders in prevention, preparedness and response to work together in the past has occasionally been impeded by a lack of mutual trust and partnership. As a result, each has often pursued its own agenda, and each has often hoped that someone else would bear the greatest burden. The result has often been "command and control" (highly detailed and burdensome) government mandates running in parallel with broad private-sector voluntary improvement programmes. Unfortunately, neither of these approaches may be perceived as much help to SMEs in meeting their own site-specific goals.

Perhaps the key to moving into a new era of effectiveness is to establish more partnerships of stakeholders who agree to work together on improving chemical safety separate from regulatory mandates. Precedents do exist for this type of partnership (for example, local hazardous materials advisory councils). While not practical or feasible for all SMEs, these partnerships could nonetheless benefit a large number of smaller operations.

In some countries, legal liability can be a major impediment to stakeholder assistance to SMEs. A stakeholder in the United States (whether it be a company, an association, a labour union, or any other group) could, in some circumstances, be found legally liable for negligence, with large financial consequences. This liability risk could be reduced through laws providing protection from "good-faith" actions; however, such laws could be construed as infringing on the rights of injured parties unless they are written very carefully. One means of minimizing liability is providing information through organisations that have a peer review process to minimize chances of erroneous information being furnished.

6.1 Public authorities

Scaling regulatory requirements to actual hazard levels

One method government agencies should consider whenever possible is scaling regulatory requirements to the actual hazard levels. The way this can be accomplished is by using *de minimis* threshold levels for quantities of chemicals handled, along with reduced paperwork for intermediate levels of chemicals handled. Very often, there are only two levels (exempt or subject to the full impact of the regulations), causing SMEs with quantities barely above the regulatory thresholds to bear the burden of requirements that are equally imposed on the largest hazard sites. In fact, sometimes there is a tremendous cumulative effect of this on small batch facilities that process or formulate a large number of chemicals in relatively modest quantities. There are even instances in which a large continuous process plant may have less paperwork and other requirements due to the smaller number of chemicals handled, despite much larger quantities that actually contribute to higher hazards.

Reduction of paperwork burden

Government authorities should avoid requiring excessive, time-consuming administrative paperwork, which can actually detract from direct safety supervision in SMEs. For example, municipal fire departments can collect much of the information for emergency planning better through on-site inspections than through requiring a great deal of paperwork. One way enterprises could show that they meet safety objectives without the major paperwork requirements imposed by government is development of non-mandatory best management practices documents.

It is important for public authorities to promote economic prosperity by finding ways to enhance the plant safety of SMEs without inhibiting growth, for example because of excessive or overlapping regulations. Like some industry standards, regulations can be helpful in promoting safety in SMEs; however, such requirements should not be so complex and bureaucratic that they actually impair an enterprise's ability to concentrate its energies and funds on achieving real, on-site results. One idea that found support at the Workshop was "one-stop shops" covering various safety and environmental areas, as long as the information is correct.

One further means of support that public authorities can offer SMEs is constructive, appropriate guidance materials explaining statutory and regulatory requirements in clear, easily understandable language.

Penalty-exempt, no-cost site consultations

One method that government agencies can employ to inform and motivate SMEs is to provide voluntary penalty-exempt site consultation/assessment services at no cost. If an SME is truly assured that consultation personnel and the enforcement personnel are separate, it is in an SME's interests to request such a consultation. However, if such a level of trust cannot be established, the programme will not work. An example of this type of programme is one carried out by the US Occupational Safety and Health Administration, which has attracted a high level of requests for voluntary consultative assessments.

"Good Samaritan" laws

In the United States, where liability problems are considerable, "good Samaritan" laws can make it easier for facilities to plan on obtaining assistance from other parties in the event of emergencies without exposing the assisting parties to unreasonable liabilities. These types of laws provide an enhanced level of safety to the public because they enable parties who want to help out in emergencies to do so.

Small business information and technical assistance centres

Government authorities could set up regional, state or provincial, or even local information centres to help SMEs with general compliance with environmental regulations. As one example, in the United States the amended Clean Air Act requires states to establish a small business assistance programme. Initially, these centres were to help small enterprises with compliance issues relating to the Clean Air Act. Now, however, some states are considering expanding the scope of the centres to cover all environmental media and one, Maryland, is piloting a multi-media small business assistance programme initially targeted to a single industry sector.

Typically, the small business assistance centres have a telephone hotline, a programme for identifying small businesses in their area and distributing materials to them, and some are able to provide on-site technical assistance. Such centres might be enlarged from existing services under a board of trade or commerce department, or they might be created within an environmental management programme. One way to fund them could be through fees generated by environmental permits. Some of these centres have quality management programmes, to which chemical process safety management could be added.

Recognition for good safety practices

Public authorities could help SMEs and encourage improved safety practices by taking a positive, co-operative attitude towards those SMEs which are doing a good job. One approach might be to establish an annual national award for safety excellence, perhaps like the Malcolm Baldrige award for management excellence in the US, which sets a comprehensive gamut of criteria for excellence towards which all companies may strive.

Make available results of international activity

International guidelines may also be helpful in supplying SMEs with safety information. It is the responsibility of government authorities to make this information available and to serve as a conduit for information to and from international organisations, such as the OECD or the UN Environment Programme (UNEP).

6.2 Larger enterprises

It would be in the interest of larger enterprises in the chemical industry to encourage and support SME safety initiatives from the standpoint of public relations, among other reasons. Large manufacturers have expressed concern about the image of chemicals and of their industry. Good safety records among distributors, processors, storers, small manufacturers, and other users can only enhance the reputation of the entire industry.

Large manufacturers of chemicals can assist their smaller customers and suppliers as well as distributors and transporters through such voluntary programmes as product stewardship, including training and assessment activities. The Responsible Care [TM] programme, active in Canada through the Canadian Chemical Producers Association, in the US through the Chemical Manufacturers Association, and in other countries through comparable organisations, has encouraged more efforts along these lines. Workshop participants gave many positive reports on the progress of the Responsible Care programme. Though it is generally acknowledged as a good programme, it does not yet reach many SMEs.

Direct outreach to SMEs

Much communication can be carried out by direct company-to-company information programmes on safety issues, by supporting trade association information programmes, by issuing detailed technical guidance on products, by in-person contacts, and so on. Currently, there are larger enterprises that provide audit and assessment services to their smaller customers or suppliers, to ensure that they are dealing with companies that have a responsible attitude towards safety. One option open to larger firms is the choice of simply not doing business with SMEs which are obviously not safe or have shown no desire or interest in regard to improving their safety practices. Or conversely, selecting small suppliers or customers because they have shown unusual initiative in improving safety.

Public education programmes

Larger firms can also indirectly affect SMEs by educating the public about the many health, economic and lifestyle benefits of their products, about industry efforts to handle hazardous materials more responsibly, and about risk analysis to insure that costs and benefits are properly analysed when allocating scarce resources. There are many ways to accomplish this, such as active participation in business and civic groups beyond the chemical industry and publication of articles in business and news media.

Other possible actions

There are many, many other questions one could ask concerning the ways larger enterprises could help SMEs meet safety objectives. For example, how can suppliers of equipment or hardware assist SMEs through some form of training? How can large industry pass on to SMEs the results of safety-related research? How can large industry assist SMEs through monitoring activities? How can large industry work with SMEs in exercises and drills for emergency preparedness and response?

Since large companies have many advantages over SMEs (see Table V), they should do more to support their small customers and suppliers by offering as much help as possible.

6.3 Financial institutions

Participation of financial institutions could include loans, consultative services, and waiving requirements for personal guarantees of loans to owners of responsible SMEs. Government co-operation would be needed to motivate lenders, but this could be a very high-leverage approach since most SMEs require lender financing.

6.4 Trade associations and professional societies

Trade associations can assist their members in improving chemical safety; however, not all SME sectors are being reached since not all trade associations are heavily involved in this field. Trade associations could provide assistance to SMEs through:

Two-way communication

They can serve as listening posts for emerging trends. They can be a cost-effective means of collecting information. They can disseminate information in forms most useful to their members. They can filter out the more important information and see that it is passed on to members. They can co-ordinate with other stakeholder groups.

Activities in conjunction with other stakeholders

These activities are carried out very well by some existing associations. These groups should be willing to advise and assist other associations that are new to chemical issues or that are newly formed. There may also be ways for trade associations to reach out beyond their traditional member base to provide information and assistance to SMEs. This could be done in concert with business or civic organisations such as chambers of commerce.

Outreach through educational institutions

Professional societies, such as engineering organisations, may cover some of the same ground as trade associations, though they also have other distinct functions. For example, they may have a link to colleges, universities, and technical institutes and may be able to make information available to SMEs through continuing education programmes at local institutions.

6.5 Labour organisations

Working with employees and employers

Labour organisations can educate their local leaders, who in turn educate members about chemical safety issues. They can also work co-operatively with employers to promote safety. In doing so, they should avoid entangling safety with adversarial bargaining issues that could distract from or impede safety.

Recognition of non-unionized workers

It should be recognised that in many areas, at least in the United States, the majority of workers are not unionized. Safety regulations should not interfere with safety enhancement in any workplace, unionized or non-union.

Alternatives to safety committees

Safety committees exist both in facilities that are unionized and that are non-union. However, due to the small number of employees in many SMEs, it is often not practical to have safety committees.

6.6 Public interest groups

Informing the public

Public interest groups can assist in informing the public objectively about safety issues. This information should reach both SME management personnel and SME workers. At the same

time, local officials and the general public will be better informed, especially if SMEs come forward to provide information that could be used for emergency planning and response.

6.7 Media

Communicating to the general public

The media, both print and broadcast, can provide information to the public at large. As part of a community's right to know what chemicals it harbours and what risks they pose, it is the news media's obligation to seek this information and convey it objectively to the public. This responsibility is magnified during an emergency.

Communicating to the trade

Commercial trade publications already print and distribute a large portion of the information that is available to SMEs.

7.0 How do we want to communicate with SMEs?

Clearly, the question of communication is one that lies at the core of "the SME problem." In this segment of the paper, the text discusses fundamental questions about the techniques, methods, and tools for communicating with SMEs, then looks at a successful example from one country for alerting SMEs to issues of plant safety.

Stakeholders committed to helping improve safety at SMEs need to determine what are the most effective ways of delivering information to SMEs – and what are the most appropriate ways for SMEs to communicate with stakeholders so that they have a voice in shaping policies and programmes that affect them. To be effective for SMEs, communications products must be presented in ways and on schedules that are familiar to SMEs. Workshop participants expressed consensus that a better understanding of practices, methods, and channels of information is the key to reaching SMEs. How SMEs communicate back to stakeholders is a subject that needs to be addressed further.

Discussion during the Workshop session on communications addressed a diversity of questions. These may be summarized as follows:

- What are the best ways to get information to SMEs?
- What type of communication strategy would be most appropriate for each stakeholder group?
- How can stakeholders pool information that would constitute effective messages?
- What are the best formats for that information?

- Which formats/vehicles have proven effective?
- Who are the most credible message-bearers?
- How can those message-bearers be convinced of the importance of communicating this information to SMEs – and then actually doing it?
- Where can SMEs go for help?
- What practices, methods, channels of information now exist that can be transformed/adapted for reaching SMEs? And on which of these can information for SMEs be "piggybacked"?
- How can SMEs communicate back to stakeholder groups to have input on the way policies and programmes that affect them are formulated?

In 1990, a group of public and private American prevention stakeholders held a series of focus groups with owners and managers of SMEs. Their purpose was to learn the perspective of SMEs on basic prevention messages, to hear first-hand about the level of awareness and practice of prevention in these companies, and to examine barriers to prevention and incentives for process safety. In the course of the focus groups, SME participants generally agreed that:

- The primary target audiences within SMEs should be owners and/or managers of plants that use or manufacture hazardous chemicals. The very important second target audience is workers.
- Trade associations are excellent ways to identify some members of the target audience, especially owners or managers of somewhat larger, mid-size firms. Smaller firms could be reached through specialty trade groups, distributors, suppliers, business licenses, and telephone directories.
- Message concepts should stress economic incentives and also the repercussions of non-compliance with regulations.
- Effective message senders could be trade associations, business organisations, but probably not the federal government.
- Effective materials for communicating the safety message could include many formats – booklets, videos, guidance documents, fact sheets, flyers inserted in pay checks, free seminars, articles in trade magazines. They suggested cartoons and readily identifiable and attractive graphics.

Though the views expressed in the focus groups represent only a small sample of American SMEs, they may not be too dissimilar from SME views in other countries. Several of these views warrant further consideration. In dealing with SMEs, as in any communication programme, it is necessary to understand the psychological mindset of the target audience.

Undoubtedly, the most credible source of information for SMEs is their peers. The peers are perceived to be familiar with the problems and limitations an SME must overcome. They also have direct experience in dealing with similar issues. Therefore, it is logical to

consider partnerships with SME peer groups as a prime way to communicate information effectively to SMEs. Such partnerships also provide a good way to get feedback from SMEs, who may find it difficult to provide feedback otherwise due to time and confidentiality constraints.

One example of a communications initiative that combines messages from SME peers with those from a variety of other stakeholder groups is a publication produced in the US by an informal group of private and public stakeholders. Using information gathered at focus groups with SME representatives, the stakeholders prepared a general brochure for SMEs that introduced the concepts of chemical process safety management, explained how it could benefit a smaller company, suggested ways to begin implementing the approach, and recommended resources for more information. Entitled *Managing Chemicals Safely*, the publication has been widely distributed in the US and has been enthusiastically received by trade associations, local emergency planning organisations, and SMEs.

An earlier segment of this paper stated that economics and resource allocation are critical elements of "the SME problem." In communicating with SMEs, one must stress the primary as well as ancillary benefits that can accompany expanded efforts on chemical emergency prevention, preparedness and response. Experience has shown that many times (but certainly not always) safety studies point out opportunities for cost savings or quality improvements. This information should be effectively "packaged" for SMEs.

8.0 Beyond plant safety

A holistic approach to safety is a primary goal of bringing SMEs into the process of improved prevention, preparedness and response. While the emphasis in these efforts is primarily on process safety (including storage and handling) and the safe management of hazardous chemicals at fixed facilities, worker safety and environmental protection are also critically linked, as well as the safeguarding of public health from chemical accidents. Though it is beyond the purview of this Workshop, hazardous installations of all sizes, and certainly SMEs, must consider a multitude of environmental issues – issues on which they are under increasing pressure to act. It is not enough just to deal with accident prevention, preparedness and response. Ultimately, these facilities need to address the entire gamut of environmental issues and consider all of them in an integrated, holistic way:

- energy management, savings, and choice;
- raw material and water management, savings, choice and transportation;
- process air/water discharges and effluent limits;
- waste reduction, recycling, re-use, transportation, disposal;
- selection of production processes;
- product design, packaging, transportation, use, disposal;
- life-cycle management of hazardous chemicals;
- personnel information and training;

- external information and participation of the public;
- integration of environmental protection, worker safety, and process safety.

This array of environmental issues can seem daunting. No one should think it is easy to respond to them. However, the perspective an enterprise develops in addressing one of these issues can often be applied to many others. When the owners or managers of a facility adopt a holistic, integrated view of chemical safety management, this philosophy can carry over into every other aspect of that facility's operation.

While some may say that integration of environmental management is not happening fast enough or widely enough, it is still true that all aspects of environmental management are merging with the mainstream of business operations. Industry has been challenged to manage environmental costs and risks as an integral part of basic business and manufacturing operations. When environmental performance is effective, it can link environmental risks, compliance with regulations and voluntary codes and standards, and costs to units of production or a percentage of sales. In other words, sound management of environmental performance in the large perspective, and sound management of chemical safety in the immediate context of this Workshop, must become a central focus of doing business.

Annexes: Tables I through V

Table I

Unique Contributions of Small Technical Companies

- **Specialised services and products that larger entities could not produce economically**
- **Technological innovation**
- **Intense motivation to succeed**
- **Job creation**
- **Entry point for new workers entering labour force**
- **Higher paid jobs than most industries (such as service industries)**
- **Close community relations due to local nature of business and employees**

Table II

Advantages of Small Entities

Communications:

- There are fewer people to co-ordinate in the overall enterprise.
- Management is not hundreds or thousands of miles away.
- Lines of communication are shorter.
- The closeness of top management to all employees can help transmit safety attitudes effectively.
- One or more members of senior management are on the operations floor every day.
- Employees can communicate more easily with management.
- Feedback is more direct on whether safety policies and procedures are being followed.
- There is greater ability to adapt and change quickly.

Specialisation:

- Management and technical personnel often know their operations in greater detail.
- Detailed knowledge can enable tighter controls.

Size of risk exposures:

- Inventories and equipment tend to be smaller.
- Batch operations help to limit scope of damage from an accident.

Table III
Resource Constraints of SMEs

- **Financial limitations are common.**
- **Safety responsibilities must be part-time for most managerial and technical people.**
- **Specialised expertise may not be required often enough to justify in-house specialist(s).**
- **Operating people must handle what would be staff activities in larger organisations.**
- **There is a shortage of on-site reference information.**
- **The large and growing number of regulatory compliance programmes divert effort from direct safety supervision.**
- **SMEs are often located in rural areas without sophisticated municipal emergency response capabilities.**
- **SMEs cannot share resources and experiences with other plants in the same enterprise.**

Table IV
External Resources Available to SMEs

- Trade associations
- Technical consultants
- Other SMEs
- Engineering companies
- Suppliers (for information on raw materials, equipment, etc.)
- Industry standard-setting groups
- Technical associations
- Fire departments and emergency management personnel
- Clean-up contractors
- Contract laboratories
- Transportation companies
- Attorneys
- Insurance companies
- Publications
- Commercial seminars
- Industry/government joint forums
- Government publications and regulations
- International organisations

Table V
Advantages of Large Entities

- **Economies of scale in production costs**
- **Economies of scale in staff support (engineering, packaging, medical, etc.)**
- **Exposure to wide ranges of markets, technologies, other industries, etc.**
- **Ability to share costs and experiences among facilities**
- **More extensive documentation of policies and procedures**
- **Libraries of reference information**
- **In-house analytical laboratories**
- **Insurance purchasing power**
- **In-house transportation departments and equipment**
- **In-house emergency response brigades**

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PUBLICATIONS LIST

ENVIRONMENTAL HEALTH AND SAFETY DIVISION, OECD ENVIRONMENT DIRECTORATE

NOTE: ^F following a title indicates that the entire publication is available from the OECD in a separate French translation. The other publications listed are available in English only, but they often contain a French summary.

^{GLP} following a title indicates that the publication is part of the OECD Series on Principles of Good Laboratory Practice and Compliance Monitoring. Translations of this series into Russian, Polish, Czech, Slovak, Hebrew, Spanish and Italian either exist or are planned. For more information, please contact the Environmental Health and Safety Division.

OECD Publications on Sale:

OECD Guidelines for Testing of Chemicals (December 1993)^F
(OECD No. 97 93 50 1) ISBN 92-64-14018-2 992 pages
Price in France: FF 800
Price in other countries: FF 1040 US\$ 178.00 DM 300

*Safety Evaluation of Foods Derived by Modern Biotechnology:
Concepts and Principles* (April 1993)^F
(OECD No. 93 04 1) ISBN 92-64-13859-5 80 pages
Price in France: FF 80
Price in other countries: FF 100 US\$ 19.00 DM 33

[Prepared in collaboration with the OECD Directorate for Science,
Technology and Industry.]

Aquatic Biotechnology and Food Safety (January 1994)
(OECD No. 97 94 05 1) ISBN 92-64-14063-8 100 pages
Price in France: FF 80
Price in other countries: FF 100 US\$ 18.00 DM 30

[Prepared in collaboration with the OECD Directorate for Science,
Technology and Industry.]

Environmental Impacts of Aquatic Biotechnology (in press)

[Prepared in collaboration with the OECD Directorate for Science,
Technology and Industry.]

*The publications above may be ordered directly from: OECD
Publications Service, 2 rue André-Pascal, 75775 Paris Cedex 16,
France. Telex: 640 048. Fax: (33-1) 49 10 42 76.*

OECD Environment Monographs:

*Environment Monographs are available at no charge, in limited
quantities, from the Environmental Health and Safety Division,
OECD Environment Directorate, 2 rue André-Pascal, 75775 Paris
Cedex 16, France. Fax: (33) (1) 45 24 16 75.*

No. 14, *Final Report of the Expert Group on Model Forms of
Agreement for the Exchange of Confidential Data on Chemicals
(1988)*^F

No. 15, *Final Report of the Working Group on Mutual Recognition
of Compliance with Good Laboratory Practice (1988)*^F

No. 17, *The Use of Industry Category Documents in Source
Assessment of Chemicals (1989)*^F

No. 24, *Accidents Involving Hazardous Substances (1989)*^F

No. 25, *A Survey of Information Systems in OECD Member Countries Covering Accidents Involving Hazardous Substances* (1989)^F

[superseded by the *Users Guide to Information Systems Useful to Emergency Planners and Responders Available in OECD Member Countries* (1991)]

No. 26, *Report of the OECD Workshop on Ecological Effects Assessment* (1989)^F

No. 27, *Compendium of Environmental Exposure Assessment Methods for Chemicals* (1989)^F

No. 28, *Workshop on Prevention of Accidents Involving Hazardous Substances: Good Management Practice* (1990)^F

No. 29, *Workshop on the Provision of Information to the Public and on the Role of Workers in Accident Prevention and Response* (1990)^F

No. 30, *Workshop on the Role of Public Authorities in Preventing Major Accidents and in Major Accident Land-Use Planning* (1990)^F

No. 31, *Workshop on Emergency Preparedness and Response and on Research in Accident Prevention, Preparedness and Response* (1990)^F

No. 35, *A Survey of New Chemicals Notification Procedures in OECD Member Countries* (1990)^F

No. 36, *Scientific Criteria for Validation of In Vitro Toxicity Tests* (1990)^F

No. 39, *International Survey on Biotechnology Use and Regulations* (1990)^F

Users Guide to Hazardous Substance Data Banks Available in OECD Member Countries, OCDE/GD(91)102 (1991)^F

[Also translated into Spanish by the United Nations Environment Programme's Industry and Environment Office (UNEP IE).]

Users Guide to Information Systems Useful to Emergency Planners and Responders Available in OECD Member Countries, OCDE/GD(91)103 (1991)^F

[Also translated into Spanish by UNEP IE.]

No. 43, *International Directory of Emergency Response Centres (1992)^F*

[The International Directory is a co-operative project of OECD and UNEP IE. Emergency response centres listed in this Directory are located in both OECD and non-OECD countries.]

No. 44, *Workshop on Prevention of Accidents Involving Hazardous Substances: The Role of the Human Factor in Plant Operations (1992)*

No. 45, *The OECD Principles of Good Laboratory Practice (1992)^{F, GLP}*

No. 46, *Guides for Compliance Monitoring Procedures for Good Laboratory Practice (1992)^{F, GLP}*

[superseded by Environment Monograph No. 110, *Revised Guides for Compliance Monitoring Procedures for Good Laboratory Practice (1995)*]

No. 47, *Guidance for the Conduct of Laboratory Inspections and Study Audits (1992)^{F, GLP}*

[superseded by Environment Monograph No. 111, *Revised Guidance for the Conduct of Laboratory Inspections and Study Audits (1995)*]

No. 48, *Quality Assurance and GLP (1992)^{F, GLP}*

No. 49, *Compliance of Laboratory Suppliers with GLP Principles (1992)^{F, GLP}*

No. 50, *The Application of the GLP Principles to Field Studies* (1992)^{F, GLP}

No. 51, *Guiding Principles for Chemical Accident Prevention, Preparedness and Response: Guidance for Public Authorities, Industry, Labour and Others for the Establishment of Programmes and Policies related to Prevention of, Preparedness for, and Response to Accidents Involving Hazardous Substances* (1992)^F

[The Guiding Principles are **also available in Russian**. They are being translated into Spanish, and may also be translated into other languages. For more information, please contact the Environmental Health and Safety Division.]

No. 52, *Report of the OECD Workshop on Monitoring of Organisms Introduced into the Environment* (1992)

No. 58, *Report of the OECD Workshop on Quantitative Structure Activity Relationships (QSARS) in Aquatic Effects Assessment* (1992)

No. 59, *Report of the OECD Workshop on the Extrapolation of Laboratory Aquatic Toxicity Data to the Real Environment* (1992)

No. 60, *Report of the OECD Workshop on Effects Assessment of Chemicals in Sediment* (1992)

No. 65, *Risk Reduction Monograph No. 1: Lead* (1993)

No. 66, *Report of the OECD Workshop on Strategies for Transporting Dangerous Goods by Road: Safety and Environmental Protection* (1993)

[The OECD's Chemical Accidents Programme and Road Transport Research Programme co-operated in organising this workshop.]

No. 67, *Application of Structure-Activity Relationships to the Estimation of Properties Important in Exposure Assessment* (1993)

No. 68, *Structure-Activity Relationships for Biodegradation* (1993)

No. 69, *Report of the OECD Workshop on the Application of Simple Models for Exposure Assessment* (1993)

No. 70, *Occupational and Consumer Exposure Assessments* (1993)

No. 73, *The Application of the GLP Principles to Short-term Studies* (1993)^{F, GLP}

No. 74, *The Role and Responsibilities of the Study Director in GLP Studies* (1993)^{F, GLP}

No. 76, *OECD Series on the Test Guidelines Programme No. 1: Guidance Document for the Development of OECD Guidelines for Testing of Chemicals* (1993; reformatted 1995)^F

No. 77, *Data Requirements for Pesticide Registration in OECD Member Countries: Survey Results* (1993)

No. 81, *Health Aspects of Chemical Accidents: Guidance on Chemical Accident Awareness, Preparedness and Response for Health Professionals and Emergency Responders* (1994)^F

[Four international organisations collaborated in the preparation of this publication: the International Programme on Chemical Safety (IPCS), OECD, UNEP IE, and the World Health Organization – European Centre for Environment and Health (WHO-ECEH).]

No. 88, *US EPA/EC Joint Project on the Evaluation of (Quantitative) Structure Activity Relationships* (1994)

No. 90: *Ottawa '92: The OECD Workshop on Methods for Monitoring Organisms in the Environment* (1994)*

No. 91: *Compendium of Methods for Monitoring Organisms in the Environment* (1994)*

[*Monographs No. 90 and 91 are companion documents.]

No. 92, *Guidance Document for Aquatic Effects Assessment* (1995)

No. 93, *Report of the OECD Workshop on Chemical Safety in Port Areas* (1994)

[This Workshop was co-sponsored by OECD, the International Maritime Organization (IMO) and UNEP.]

No. 94, *Report of the OECD Special Session on Chemical Accident Prevention, Preparedness and Response at Transport Interfaces* (1995)

No. 95, *Report of the OECD Workshop on Small and Medium-sized Enterprises in Relation to Chemical Accident Prevention, Preparedness and Response* (1995)

No. 98, *OECD Series on the Test Guidelines Programme No. 2: Detailed Review Paper on Biodegradability Testing* (1995)

No. 99, *Commercialisation of Agricultural Products Derived through Modern Biotechnology: Survey Results* (1995)

No. 100, *Comparative Analysis of Data Elements Used in the Assessment of Certain Products of Modern Biotechnology* (1995)

No. 101, *Risk Reduction Monograph No. 2: Methylene Chloride* (1994)

No. 102, *Risk Reduction Monograph No. 3: Selected Brominated Flame Retardants* (1994)

No. 103, *Risk Reduction Monograph No. 4: Mercury* (1994)

No. 104, *Risk Reduction Monograph No. 5: Cadmium* (1994)

No. 105, *Report of the OECD Workshop on Environmental Hazard/Risk Assessment* (1995)

No. 106, *Data Requirements for Biological Pesticides* (1995)

No. 107, *Report of the OECD Workshop on the Commercialisation of Agricultural Products Derived through Modern Biotechnology* (1995)

No. 108, *Final Report on the OECD Pilot Project to Compare Pesticide Data Reviews* (1995)

No. 110, *Revised Guides for Compliance Monitoring Procedures for Good Laboratory Practice* (1995)^{F, GLP}

No. 111, *Revised Guidance for the Conduct of Laboratory Inspections and Study Audits* (1995)^{F, GLP}

No. 115, *Guidance for the Preparation of GLP Inspection Reports* (1995)^{F, GLP}

No. 116, *The Application of the Principles of GLP to Computerised Systems* (1995)^{F, GLP}

No. 117, *Industrial Products of Modern Biotechnology Intended for Release to the Environment: The Proceedings of the Fribourg Workshop* (1995)