

## **APELL, SAFER PRODUCTION AND CORPORATE SOCIAL RESPONSIBILITY – LINKING THREE INITIATIVES TO IMPROVE CHEMICAL SAFETY IN THE THAI CHEMICAL INDUSTRY**

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### **INTRODUCTION**

The APELL (Awareness and Preparedness of Emergencies at Local Level) Process is an initiative of the United Nations Environment Programme (UNEP) which was initiated in the late 1980s in response to a number of major chemical accidents in industrialised and industrialising countries. The focus of the process is to enable the local community to identify the risks to which it is exposed and provide a mechanism for preparedness in dealing with such risks, coordinated between the relevant industries, local authorities, and the community. Safer Production is a term which is being applied to the tools, guidelines, and management principles implemented at site and local level to ensure the health and safety of the workers at the companies handling hazardous substances as well as preventing releases which may cause harm to the environment or endanger the health of the local community. Corporate Social Responsibility (CSR) is a more recent development. This initiative is a development of the environmental management issues which gained widespread acceptance in the 1990s to take in the interaction with other stakeholders, particularly local communities and other trading partners.

One of the aims of the project described in this paper is to use the resources and structures developed within these existing initiatives and apply them to the chemical industry in Thailand with the aim of improving chemical safety throughout the supply chain. This 2-year project started in October 2006 and is being run from within the UNEP Division of Technology, Industry and Economics (DTIE), based in Paris. Project activities in Thailand are being coordinated in conjunction with the local UNEP Regional Office for Asia and the Pacific, in Bangkok. At the national and local levels, the project is benefiting from cooperation and support by the Department of Industrial Works of the Thai Ministry of Industry, Mahidol University, the Thai Environment Institute, and by key stakeholders in the Thai chemical industry, such as the Responsible Care Management Committee of Thailand, and the Chemical Industry Club of the Federation of Thai Industries.

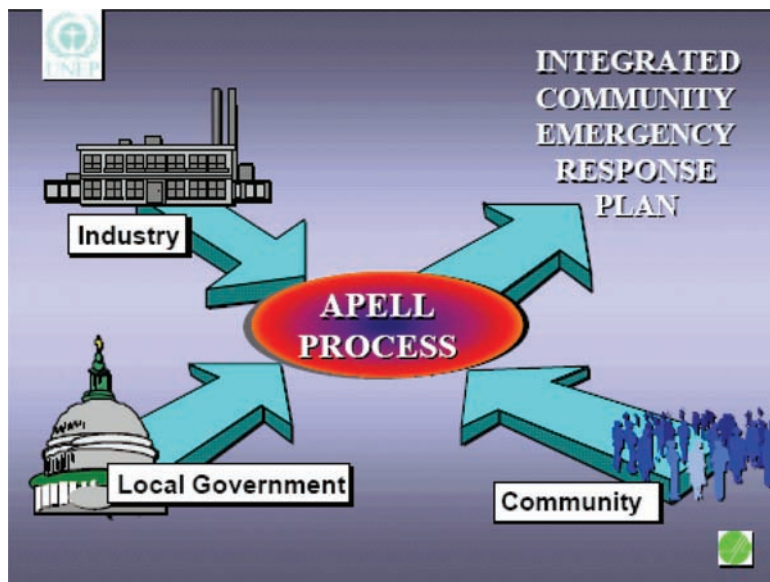
### **THE CHEMICAL INDUSTRY IN THAILAND**

The chemical industry in Thailand is characterised by import, export and formulation activities. Most of the imports are made by traders, which play a key role in the chemical industry value-chain in the country. There is, according to the needs assessment report

written in preparation for this project, little heavy chemical industry producing primary chemicals. In addition to reformulation and repackaging there is a large section of chemicals handling activities being carried out by the electroplating and electronics industry. The formulated chemicals cover the whole range of industrial chemicals, household chemicals, toiletries, cleaning agents and additives. According to the National Statistical Office there are 2241 registered chemical industries in Thailand. These industries have an official permit to operate issued by the Department of Industrial Works of the Thai Ministry of Industry, allowing the use and formulation of chemical products.

A number of multi-national (European and North American) chemical companies have subsidiaries in Thailand and the Thai government has developed a number of large industrial estates with central infrastructure.

This does however leave a large number of mainly indigenous Thai companies, mainly of the Small and Medium Enterprise (SME) scale, who handle a wide range of chemicals with a wide range of risks and hazards. In addition, if considering all the industries that use chemicals extensively in their manufacturing processes, the number of companies will be in the range of 10,000–12,000. These chemical industries are located all over Thailand.

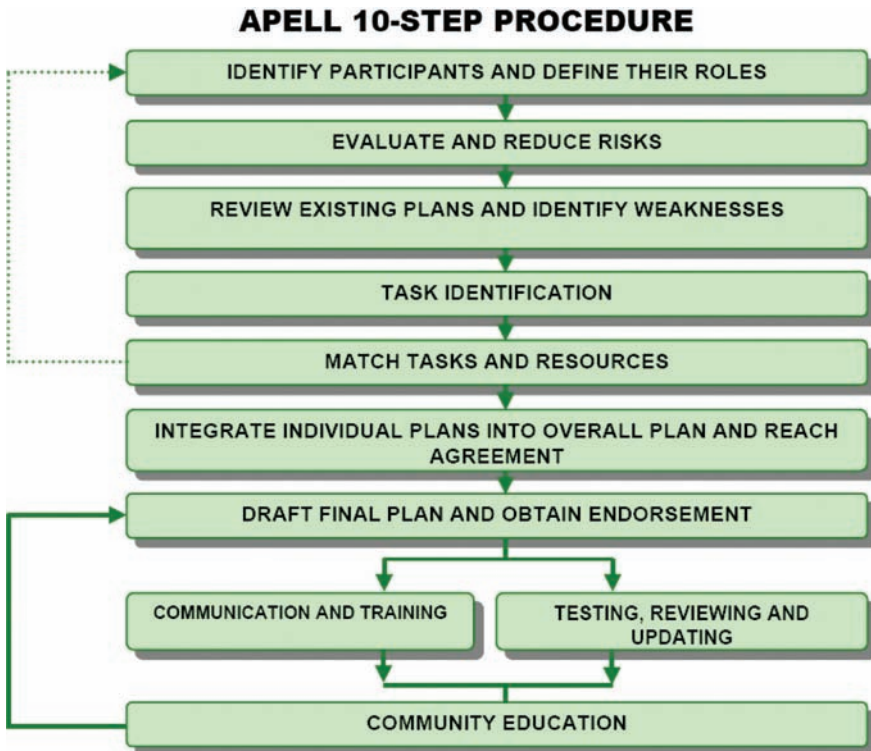


**Figure 1.** The integration of industry, local authorities and community leaders in the APELL Process (Source: UNEP – DTIE)

**THE APELL PROCESS**

As the name “Awareness and Preparedness of Emergencies at Local Level” suggests the implementation of this process achieves a better level of preparedness by industry and local emergency services, and an understanding by local people of how to react to an emergency. This is attained by developing a meaningful dialogue between industry, local authorities and the local community leaders. The process is managed by a local co-ordinating group which includes representatives from all important stakeholders and is responsible for reviewing the hazard situation and then supervising some of the measures needed to address these hazards, towards the development of an integrated community emergency response plan .

The establishment of such a group can be initiated by anyone, however it has been found useful to request either industry or the local authorities to do this. Community groups can also convene a co-ordinating group if they are concerned that there are significant risks which have not been adequately addressed by official activities.



**Figure 2.** The APELL Process (Source: UNEP – DTIE)

The APELL Process is a ten step programme to identify hazards and assess their risks, whilst involving all necessary participants throughout [Balkau 2002].

### **SAFER PRODUCTION**

Safer Production is a concept which comprises the tools guidelines and management principles which are implemented by a facility handling hazardous chemicals to ensure the health and safety of its workers and to minimise the risks of a release of hazardous chemicals which may harm the environment or endanger the local community. Within Europe it would be recognised that these aims fall within the scope of the Seveso II Directive (COMAH Regulations in the UK) for larger scale activities and other regulations on hazardous chemicals and machinery for those sites with smaller chemical inventories. Safer Production is based strongly on the approach of:

- identifying hazards
- assessing risk
- defining risk reduction measures
- setting out the safe modes of operation and the necessary competency
- defining inspection and control measures
- defining management structures and responsibilities

In addition to there being legal frameworks in which these aspects are regulated there are industry initiatives such as Responsible Care, which share many of the same elements. With the launch of the Responsible Care framework in Canada in 1985, the chemicals industry publicly declared a voluntary commitment to go beyond legal requirements. Under this framework, companies work together through their national associations in a continuous search to improve their health, safety and environmental performance, promoting communication with their stakeholders about products and processes.

In May 2003, the International Council of Chemical Associations (ICCA) announced it was undertaking a global review of the Responsible Care framework, which resulted in the new Responsible Care Global Charter, launched to the public at UNEP's International Conference on Chemicals Management in Dubai in February 2006, alongside with the industry's Global Product Strategy initiative (GPS). One of the important aspects linked to Responsible Care and the new GPS is Product Stewardship which moves the issue of product safety along the value chain from only involving the manufacturing unit to include customers and other users.

### **CORPORATE SOCIAL RESPONSIBILITY**

Corporate Social Responsibility has been variously defined as:

*“Corporate Social Responsibility (CSR) is the continuing commitment by business to behave ethically and contribute to economic development while improving the quality of life of the workforce and their families as well as of the local community and society at large.”*

### The World Business Council for Sustainable Development

*“... a concept whereby companies integrate social and environmental concerns in their business operations and in their interaction with their stake holders on a voluntary basis.”*

### The European Commission

*“A values-based way of conducting business in a manner that advances sustainable development, seeking positive impact between business operations and society, aware of the close interrelation between business and society as well as of companies, like citizens, having basic rights and duties wherever they operate. Some, for example the negotiating texts of the World Summit on Sustainable Development, speak of corporate Environmental and Social Responsibility (CESR).”*

### UNEP Global Compact Environment Principles Training Package

Those used to working with or inside the chemical industry will recognise the high degree of congruence between the Responsible Care initiative and CSR. Responsible Care is one of a wide range of CSR frameworks and some companies and corporations assess their achievement in this area using more than one tool.

There are a number of reasons for implementing CSR measures within a company. However CSR has been shown to include the following benefits:

- it addresses economic, social and environmental considerations in an integrated manner
- it addresses ethical considerations
- it facilitates innovation and learning
- it provides employee motivation
- it improves risk management or risk reduction
- it can increase access to capital or increase shareholder value
- it can enhance reputation or brand
- it can enhance market position (market share) improvement
- it can strengthen supplier relationships
- it can result in cost savings and improved efficiency
- it can enable improved relationships with government authorities

It is thus apparent, that CSR provides the potential to bring about change in the way a corporation is perceived or even in its economic position; however it does not provide a guarantee. The main driving forces are the ethical issues and the role of the chemical company as a “citizen” and “good neighbour”.

## **THE PROJECT**

Project activities in Thailand have the central aim of building the capacity of SMEs, local and regional authorities towards improved chemicals safety, emergency preparedness and

information on chemical risks along the value-chain. Regarding emergency preparedness, the “APELL-SP-CSR” project aims to build on the APELL approach which is very much orientated towards local communities and stake holder engagement. By integrating CSR components, in particular stakeholder engagement and site level reporting there is the opportunity to forge links between what happens on site and the local community, and between companies and their business partner partners and customers. By bringing the concepts described under the heading of Safer Production into the structure the project also gains a clear alignment towards the reduction of chemical risks, both at site level and off-site.

Originally the project was to be based around a cluster of SMEs located in Chonburi Province; however, following a request by the Department of Industrial Works of the Thai Ministry of Industry, the project is now centred on the Bangpoo Industrial Estate in Samutprakarn province. This will allow the DIW to ensure the contiguity of the capacity building activities activities being promoted in Bangpoo since 1998 by the gtz (Gesellschaft für technische Zusammenarbeit – German society for technical cooperation) under the “Implementation of a System for the Safe Transport and Handling of Dangerous Goods” and the “Risk Management for the Handling of Hazardous Materials by SMEs in Bangpoo Area” projects.

Under these two capacity-building projects, gtz promoted the development of technical guidance and training sessions aimed at companies and governmental officials, and a risk assessment and profile of 88 factories dealing with hazardous materials in the Bangpoo area. Main conclusions of this risk assessment point to high exposure (through lack of Personal Protective Equipment – PPE and of understanding of the properties of the chemicals and hazards involved) and fire and explosion risks as the main problems to address for improving chemical safety management in Bangpoo.

As for the UNEP DTIE APELL-SP-CSR project, planned project activities include the development of practical tools for improving best practices and communicate risk in an effective way, and to assure that business partners (suppliers, transporters, distributors, customers, etc) and community stakeholders are clearly identified and engaged for raising their awareness to chemical hazards and risks. Within the scope of the project, companies’ safety officers and government safety inspectors will be trained on chemical hazard identification, risk assessment and general best practice, for improving their understanding of the issues underlying improved chemical sasfety management. They will also be subject to awareness raising sessions on the economic benefits of improved chemical safety at site and in the companies they are doing business with.

For leading the training activities under the APELL-SP-CSR Project, UNEP is involving a local technical institution – the Thai Environment Institute – and will seek to engage “Responsible Care Ambassadors” and “Code Champions” within the Thai chemical industry for additional support. At present, there are more than 70 companies in Thailand which have adopted Responsible Care. All of these companies are large scale companies or multinational companies. These companies have formed a group named as “Responsible care management Committee of Thailand (RCMCT)” under the Chemical Industry Club, Federation of Thai Industries.

“Responsible Care Ambassadors” and “Code Champions” are used by these industries to promote the Responsible Care programme by supporting smaller or less able companies through capacity building. In a similar way the Thai Chemical Manufacturers Association, which although it is not a member of ICCA is committed to the RC framework, could not only promote RC amongst its members but also champion the principles towards other trade associations such as transportation or associations which utilize the end products (e.g. electronics, surface treatment or household products).

One concept to developing the project further is not just considering chemical safety along the supply chain, but also across the whole chemical handling industries. This needs to involve transportation, storage and supply operations. There has to be a concerted effort not only to target individual enterprises but also the trade and industry associations. This is of particular importance, taking into account the role that traders play in the overall value chain. In this way, consistent paths of communication may be developed.

In considering the chemical supply-chain, chemicals may be sourced from companies which implement the ICCA “Responsible Care” programme together with its “Global Product Strategy” which aims to manage chemicals over their lifetime, or they may be sourced from companies which are outside of this scheme. Sourcing chemicals from outside of the RC Scheme introduces particular aspects for safety along the supply chain. Chemicals may be sourced from non-RC Thai companies or from outside of Thailand e.g. India or China. It is necessary to raise awareness for the minimum acceptable requirements for the packaging, labelling, documentation and transportation of the chemicals being supplied. The adoption of the Globally Harmonised System (GHS) over the next few years (Thailand has an ambitious goal of implementing GHS by 2008/9) may go some way towards achieving these aims; however it is to be expected that the time to reaching a high level of compliance will be long unless the principles found in RC and GPS are not understood and communicated up and down the supply chain and across the whole chemicals handling industries. Regardless of where from the chemicals are sourced the company or person handling or receiving them must be made aware of the risks involved at all stages of the supply-chain.

“Responsible Care” companies would be expected to supply the necessary information on the chemical hazards, for example as a Material Safety Data Sheet (MSDS) in the relevant languages for the supply chain, as a matter of course. Also contact details for dealing with spillages and emergencies relating to the chemicals supplied should be available. The chemicals should be packaged and labelled in a clear and suitable form for the conditions of transport and storage which can reasonably be expected over the entire transport route from the supplier to end user. Compliance with national and international legal requirements is a minimum of what is expected.

The “Responsible Care” companies should encourage the receiving partner to learn to recognise the value of achieving the standards of chemical management and safety of the “Responsible Care” programme and to adopt these values as far as possible themselves. In doing so the receiving partner would then place similar expectations upon those chemical suppliers which were outside of the “Responsible Care” Programme and which



may not necessary hold these values automatically. This would lead automatically to an improvement of chemical safety across the whole chemical supply spectrum.

The chemical supply chain will necessarily involve transport systems by rail, road, ship (marine and inland waterways) or air. The parties involved in transportation must not only understand the special requirements relating to the transportation of hazardous materials (packaging, compatibility within loads, limits to load sizes, temperature, moisture, etc.); the requirements relating to general safe transport (speed restrictions, weight restrictions of loads, technical standard and integrity of the vehicle, etc.) must also be considered. The fact that the expectations and experience of companies used to operating in industrialised countries may be of a far higher standard than in many other countries needs to be considered when supplying chemicals to companies operating in these less industrialised countries. Appropriate robustness of packaging, information on handling or even restrictions on particular transport modes may therefore need to be considered.

The transportation route may not be direct from the supplier/manufacturer to the end user/final customer. The manufacturer may supply to distributors or other third parties. These may in turn combine deliveries from various suppliers to make up individual loads or even repackage the chemicals concerned (20 tonne lorry load into 25 kg sacks). Distributors and haulage firms need to understand the hazards and the risks involved in (intermediate) storage, packaging, commissioning, consignment management, loading and transportation of a wide range of chemicals. It is important that the information provided (MSDS) is comprehensible and is acted upon. Within the transportation link of the supply chain it is important that loads including hazardous chemicals are accompanied with appropriate documentation in the relevant languages to correctly identify the chemicals and also to be able to provide the correct emergency response in the event of a transportation accident or spillage. Contact details for advice and assistance are also of great value as in some cases special equipment or specialist knowledge may be required.

At the end of the supply chain the final customer/end user must be supplied with all of the necessary information to be able to carry out their activities safely. The end user is different to transportation in that they generally wish to utilize the chemical characteristics of those substances supplied (solvents, chemical reactions, pesticides, pigments, etc.) Therefore it is necessary for the end user to understand the chemical hazards in particular detail. Some chemicals require particular competence to be able to handle them safely, (e.g. explosives, pesticides). The supplier/manufacturer should consider the necessary requirements when making the chemicals available.

If the manufacturer/supplier is also supplying technology to handle the chemicals involved, then the supplier must consider the cultural and social differences as well as technological differences which may exist between the originating and destination countries. This may need to make particular allowances for irregular power supply, lack of maintenance and availability of spare parts, differing levels of manning, etc. The systematic identification of hazards and assessment of risks must be carried out for the location in which the chemicals or technology are going to be used. A direct transfer of results from previous assessments without considering the local situation will not reflect the particular risks to which the local employees and communities are exposed. This will lead to inadequate or incompatible



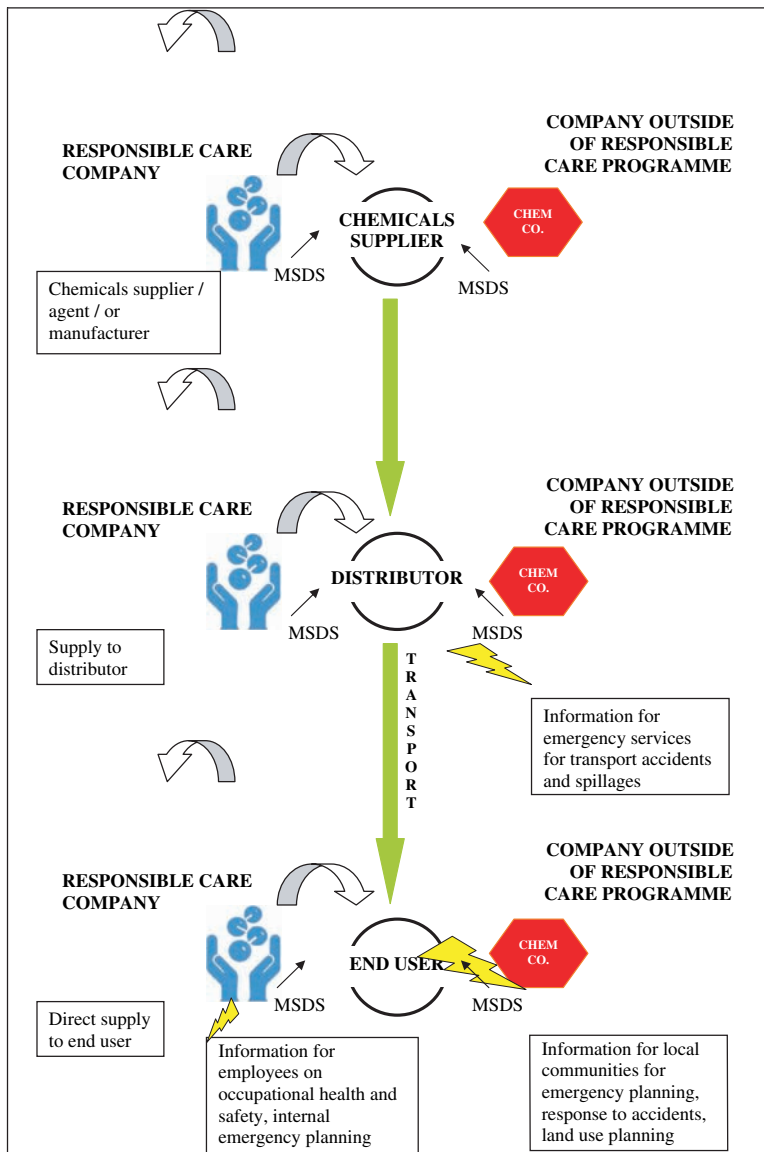
emergency planning or land use planning and harm not only the local population but also the reputation of the supplying company. The loss of reputation may even be a bigger financial risk than the loss of plant or equipment.

Guidance on specific aspects of chemical accident prevention preparedness and response beyond those regulated directly in the international agreements or national legislation may be found in the OECD Guiding Principles on Chemical Accident prevention preparedness and response. Guidance for dealing with emergencies as a result of chemical accidents may be found in the documents of the UNEP APELL Program.

### **THE ISSUES TO BE PURSUED**

Whilst the application of APELL, CSR and Safer Production to locations with multinational corporations is feasible and is already practice in differing degrees at various locations around the world, the situation changes enormously when moving to small and medium enterprises in developing countries. A number of questions arise which have as yet to be fully addressed. These include:

- The identification and assessment of hazards and risks. In societies where the day to day living is associated with a relatively high level of risk due to the environment and economic constraints (e.g. ranging from poisonous snakes to extreme poverty) the appreciation of the risks inherent with handling hazardous chemicals is different to that of western European or North American society. This poses obstacles to relatively simple issues such as the use of PPE, the design and operation of processes so as to minimise the need for PPE and also general good housekeeping to avoid spills, releases and emissions. It is not unusual to observe workers in chemical installations wearing flip-flops as shoe-work and makeshift, rag face masks as protection from vapours and dusts. However this must be seen in the context, that this is normal foot wear in this part of the world and that the air quality in Bangkok is very poor compared to European standards.
- A further issue is the communication of information on hazardous materials and processes. The information needs to be provided in a format that can be understood. It is probably not sufficient to provide MSDS in the Thai language. More efforts need to be made which take account of the general understanding of chemicals risks and also of the level of literacy in the workforce. For finding the best approach, it is of the utmost importance to not only involve local technical institutions, but also to engage successful companies that are experienced in risk communication and training.
- Thailand has agreed to adopt the GHS system by 2008, however there is likely to be a period in which there is dual use of both the GHS and the current Thai chemicals legislation.
- With the limits of risk understanding, literacy and the culture which abounds in Thailand there are constraints to the success of a paper based methodology. Whilst APELL, CSR and SP are all processes from the industrialized nations and thus are dependent on paper documentation, there needs to be a review of how much documentation is necessary.



**Figure 3.** A model for the transfer of chemical safety competency along the supply chain and across the business sector

Of primary importance is an increase in the understanding of the risks, the hazards which leads to these risks and how to manage them successfully. It may be necessary to consider the use of visual aids including posters, illustrations and training videos to transport this message.

- Finally, engaging SMEs requires a strong effort in communication and outreach. The burden of day-to-day operations often precludes companies from engaging in training and implementation of best practices, where a considerable amount of time – and formal commitment – is usually required.

### **WIDER MEANING FOR THE CHEMICAL PROCESS INDUSTRY**

In presenting this paper at the Hazards XX Symposium it is hoped that interest and awareness for the issues affecting industrializing countries such as Thailand can be raised. Companies which invest in developing economies, in particular those who maintain subsidiaries and export technology need to be aware that there is a major difference to operating in the UK or in other parts of Europe.

Legislation may not be developed in such a way that the same requirements are placed on an operator with regard to health, safety (occupational and process) and the environment and the regulatory enforcement culture may be weaker than that which they are used to in their native country. This means that corporate social responsibility and safer production initiatives have a real role to play in setting and maintaining high standards regardless of whether much lower standards would be sufficient to achieve legal compliance.

Cultural and social expectations in industrializing countries such as Thailand are also very different to those of Western Europe. In countries where the standard of living for a large proportion of the population is extremely low and day to day living poses a sizeable risk then other risks, such as those posed by chemical accidents or occupational exposure to hazardous chemicals will be seen by the local population as being tolerable at a higher level of risk if they perceive an immediate benefit than in more industrialized countries.

This work is very much work in progress and the end results will not be measurable for some time. However the situation is not unique in the world, and with an increasing globalization and pressure to move industrial processes to the developing world, there are increased demands on the chemical industry and the chemical safety community worldwide to ensure that the pressure to develop economically does not overtake the possibility to maintain this economic development in a safe and socially sustainable fashion.

### **ACKNOWLEDGEMENTS**

This paper has been prepared with the kind assistance and co-operation of Tomas Marquez, Ruth Coutto and Sandra Averous of the UN Environment Programme (UNEP), Division of Technology, Industry and Economics (DTIE), to whom I am most grateful.

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