



ELSEVIER

Journal of Hazardous Materials 65 (1999) ix–xi

**Journal of  
Hazardous  
Materials**

## Preface

Major hazards are not new. Throughout his existence on this planet, man has been prey to external threats to his safety, health, or well-being, either individual or collective, as the archaeological records show. At first, the threats came from natural sources; and only later did man's experiments in control over those natural forces result in a degree of self imposition of the associated risks. It was at a relatively late stage in man's development when the risks from his artefacts began to carry significant potential for public harm—probably the first example of a 'chemical' risk derives from the invention of black powder almost a millennium ago—but it took the Industrial Revolution—with the problems of steam boiler explosions, large scale water damming, and so on—only two centuries or so ago, to herald in significant and widespread risk from industrial activities. That revolution continues to unfold today, and brings with it the potential for harm from man's artefacts on a planetary scale.

It is from the process side of manufacturing industry that the risks from major chemical hazards come, with the potential for cataclysmic fire, explosion, or toxic release. From the early beginnings of the chemical industry (to feed the demands of the rapidly developing textile industries for detergents, bleaches, mordants and dyestuffs), via the manufacture of coal gas, through the development of chemicals derived from coal, through the processes involving the fixation of nitrogen, to the oil based petrochemical industry, processing industry has followed a pattern of growth of scale, of processing units, of storage, and of processing conditions, including significant increases in temperature and pressure. And all these developments resulted in a need for ever increasing sophistication in the chemical engineering applications of containment technologies.

Despite a litany of incidents in the historical record, regulatory response, at national and international level was piecemeal and low-key. In the UK, the first official reference of significance, to the risks from large scale storage or processing of chemicals came in 1967, with more formal highlighting in the Report of the Robens Committee of Inquiry into occupational safety and health, in 1972. By that time, the perceived risks were such as to warrant, in the UK, the introduction of land use planning consultation arrangements aimed at providing some degree of control over incompatible land uses. But it took the climacterics of Flixborough in 1974, and Beek, (1975) Manfredonia and Seveso (1976) to concentrate the potential will, in the UK and Europe, respectively, with the aim of erecting a system of controls to counter the threats posed by, or perceived from,

hazardous installations. The developing and developed European concepts were taken, and modified for use elsewhere in the world, their development and introduction punctuated by continuing reports of major incidents and accidents, across the globe, pointing up the very real need for such controls. And the nature of the hazards and risks did not change, in this litany of events—it was only the scale of events and other consequences, on people or on the environment which changed, culminating in the tragedies of Mexico City and Bhopal.

This special issue of the *Journal of Hazardous Materials* is timed to coincide with the culmination of initiatives in the European Union to develop and apply appropriate controls over major chemical hazards, across the widely diverse communities and states forming the Community. It is a culmination which is embodied in the so called 'Seveso II' Directive on control of major industrial hazards, which was adopted early in 1997 and comes into force, across the community, in February 1999.

Rather than preface them with extensive commentary, our editorial policy has been to allow the papers to speak for themselves. Each of the papers is intended to be self contained, but there are many references and relationships to other papers in this publication, and elsewhere. And we have ordered the papers with the intention of bringing out the synergies of these relationships, for the wider issues.

Our editorial approach is to focus first on aspects of the Directive, and then to look at some topical issues related to the Directive, following, as appropriate, the order in which the relevant articles of the Directive are arranged.

*The Directive (96 / 82 / EC on the control of major accident hazards using dangerous substances)*

The first paper in the special issue comes from the legislative centre of the community, and focuses not only on the content of the new Directive, but on how that content differs from, and builds on, earlier legislative controls. This is followed by a (perhaps controversial) view from an industrialist, placing the Directive's controls in a business context. Information then follows on how community guidance has, and will underpin the introduction and implementation of the Directive from the centre, with some indications and examples of the relevant EU research programmes (past, present, and proposed), along with a specific example on approaches to model validation. Succeeding papers then give some examples of some member states preparations for implementation, along with a look towards the relevance of the Directive to the countries of Central Europe which are looking towards membership of the European Union.

*Topical issues*

Although Seveso I always had an environmental dimension (indeed the incidents at Manfredonia and Seveso both caused significant environmental damage) environmental risks were not fully focused until the Sandoz fire (and subsequent pollution of the Rhine) in 1986. Seveso II embraces a further enhanced emphasis on environmental risks, and environmental risk assessment is considered in some depth, as is the difficult topic

of substances which will, or may, only be produced via process excursion or accident, where a potential methodology is suggested.

Seveso II highlights and emphasises the central role of a policy for major accident prevention, and the pivotal role of adequate systems for safety management. The nature of such systems, and the problem of performance measures are considered by a senior safety manager in industry. This is followed by an analysis of the value of safety reports, and of risk assessment, from the point of view of an insurer—representing a commercial interest with both the involvement and the potential to make substantial contributions to improved risk management in this area of industrial activity.

Emergency planning and management forms another major element of the Directive, which contains new requirements on this subject. The place of emergency planning in wider management of crisis is developed in a paper from a risk consultancy with wide experience in this area, with particular relevance to the new requirement to test Seveso emergency plans.

Incompatibility of adjacent land uses has long been recognised as a hindrance to future development, as well as a problem arising from the historical legacy. A paper on land use planning provides a wide overview of practices in the community and elsewhere; whilst a paper on risk communication, arising from recent research work in the UK, illustrates some of the non-technical problems associated with the Directive's new requirement for extended public participation in decision making, both for land use, and for emergency planning; and which may have spin-off implications for the requirement for openness in and public availability of, safety reports.

The new Directive places significant new duties on competent authorities in member states, in implementing the provisions of the Directive. A paper from one member state illustrates a methodology linking inspection and assessment, of both technical and systems elements, as part of an overall inspection programme. This is one of many types of approach to this issue (some others are alluded to in earlier papers, for example, on illustrations of national practices). And a final paper describes the enhanced core role of the Commission, in collecting and disseminating accident data.

The special edition is, therefore, designed to inform the reader about the content, especially the new content, of the Seveso II Directive; to highlight and illustrate some current initiatives, especially in those areas of novelty; and to provide examples of how member states, and other interested and involved groups, are preparing for the challenge of implementing the Directive, and making it work. To make it work will involve the commitment of all stakeholders; but success will bring with it the rewards of safer management of these areas of industrial risk, and the reduction of the potential for disaster.

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