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RISK COMMUNICATION LAW AND IMPLEMENTATION ISSUES IN THE UNITED STATES AND THE EUROPEAN COMMUNITY

MICHAEL S. BARAM*

I. INTRODUCTION

Risk communication has become an important element of public policy in the United States and the European Community (E.C.) for reducing technological risks to workers, product users and community residents. The risk communication process involves disclosure by an industrial firm (or other party) of information about the hazardous attributes of its activity or product to a regulatory agency or to persons who may be at risk, thereby facilitating a shared understanding of the risk and enabling interpretation of various risk prevention and response measures.¹

There are two general patterns of risk communication. One involves industrial disclosure to a government agency, followed by agency transfer of the information on request to the public or persons at risk, a two-step process. The other, which is the subject of this paper, involves industrial

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¹ Risk communication may be voluntary or compelled by law. See M. Baram, Risk Communication: Moving From Theory to Law to Practices (Nov. 11, 1986) (paper presented at annual meeting of Society for Risk Communication, Boston, Mass.). Firms or other parties may conduct risk communication under conditions guaranteeing its confidentiality, see CONSEIL EUROPEAN DES FEDERATIONS DE L'INDUSTRIE CHIMIQUE (CEFIC), BRUSSELS, BELGIUM, INFORMATION ON HAZARDS OF SUBSTANCES AT THE INDIVIDUAL WORKPLACE, (Apr. 1978); or which provide for public access or promote widespread dissemination. Its content may include abstract or generic information about hazard attributes of a particular substance or process (e.g. chemical toxicity and flashpoint), and personalized information about a particular person's health status (e.g. the blood-lead level of a worker in an industrialized facility using lead). Risk communication may include qualitative and judgmental information (e.g. as to the seriousness of a past exposure to a chemical about which little has been proven), and may also include quantitative data and estimates of a relatively conclusive nature (e.g. as to the proven capacity of a particular chemical process safety system).

disclosure directly to persons at risk or their local or personal representatives, essentially a one-step process.

In the United States, the two-step process is well established. The first step has been mandated by numerous laws dealing with environmental and health risks which require firms to provide hazard information to federal agencies under several circumstances, e.g.:

- 1) to secure pre-market approval of new chemicals, drugs, or pesticides;
- 2) to secure permits or public funding for various projects;
- 3) to report on routine discharge of air and water pollutants or management of hazardous wastes in order to demonstrate compliance with agency permits and standards which govern such activities; and
- 4) to report spills and other accidents which endanger health or the environment.

The second step of the process is structured by a single law, the federal Freedom of Information Act (FOIA).² FOIA requires that federal agencies provide information in their possession, including hazard information, to "any person" on request, subject to certain important exceptions (e.g., trade secrets, national security).³

In the E.C., however, this two-step process of risk communication has not been fully achieved. Although the first step is mandated by numerous laws and report requirements similar to those in the United States, there is no generic FOIA requirement that agencies transmit the industrial information they receive to members of the public, despite growing public pressure for enactment of FOIA-type laws.⁴

The one-step process is new, bold and controversial. Nevertheless, it has recently been adopted by several parallel actions taken in both industrial societies. In the United States, a "hazard communication" rule has been enacted by the federal Occupational Safety and Health Administration (OSHA), which mandates that employers inform and educate workers about hazardous chemicals in the workplace.⁵ Similar "worker right to know" laws and regulations have been enacted by some thirty states.⁶ Further, Congress enacted the federal Emergency Planning and Community Right to Know Act (EPCRA) in 1986 requiring industrial disclosure of accident risk and routine release of risk information to state and local units of government

² 5 U.S.C. § 552 (1982).

³ *Id.* at § 552(b).

⁴ Limited versions of FOIA have been enacted in Denmark, but have not been fully implemented because of bureaucratic reluctance and public passivity. *See Environmental Information*, 1987 *EUROP. ENV. Y.B.* 190-91.

⁵ 29 C.F.R. § 1910.1200 (1987) (federal hazard communication regulation commonly referred to as the "worker right to know rule").

⁶ *See generally* Baram, *The Right to Know and the Duty to Disclose Hazard Information*, 74 *AM. J. PUB. HEAL.* 385 (1984).

to facilitate emergency response planning and stimulate risk prevention measures at the local level.⁷ Notably, this law also guarantees immediate public access to industrial information received by local officials.⁸ Once again, numerous states and municipalities have enacted similar "community right to know" laws.⁹

Variations on the one-step process of risk communication have been mandated by E.C. Directives and several national laws. The E.C.'s "Sixth Amendment" requires product labelling to inform workers and other product users of risks;¹⁰ the "Seveso Directive" on "Major Accident Hazards" requires firms to inform national and local officials of accident risks and safety measures in place to facilitate emergency planning.¹¹ Under the Seveso Directive, this information is to be provided to the public on a "need-to-know" basis to enable its effective participation in emergency response programs.¹²

In the United States, the new one-step process of risk communication are commonly referred to as "right-to-know" programs and have satisfied many diverse critics of traditional federal regulation. Unions and public interest groups, impatient with traditional federal regulation and seeking empowerment, have led the right-to-know movement and view these recent legal developments as successes. The new federal right-to-know laws also provide a policy framework that is substantially consistent with the view of conservative advocates of "new federalism," who argue that government authority be shifted from federal to state and local levels and the private sector.¹³

These right-to-know programs may also remedy one of the frequently cited obstacles to greater reliance on market and private sector controls over risky industrial activities (such as tort liability), namely the lack of adequate risk information. Right-to-know laws therefore strengthen the arguments of those who believe market controls are more effective than government regulation. Finally, sharing risk information improves the quality of public

⁷ See *infra* note 45.

⁸ 42 U.S.C. § 11044 (Supp. IV 1986).

⁹ See Baram, *Chemical Industry Accidents, Liability and Community Right to Know*, in 76 AM. J. PUB. HEALTH, 568-572 (1986) (reviewing "Community Right to Know" laws through early 1986).

¹⁰ Council Directive of Sept. 18, 1979 (79/831/EEC), 22 O.J. EUR. COMM. (No. L 259) 10 (1979) amending Council Directive of June 27, 1967 (67/548/EEC), 10 J.O. COMM. EUR. (No. 196) 1 (1967).

¹¹ Council Directive of June 24, 1982 (82/501/EEC), 25 O.J. EUR. COMM. (No. L 230) 1 (1982) (hereinafter Seveso Directive).

¹² *Id.* art. 8, at 4.

¹³ See M. BARAM, CORPORATE RISK MANAGEMENT: INDUSTRIAL RESPONSIBILITY FOR RISK COMMUNICATION IN THE EUROPEAN COMMUNITY AND THE UNITED STATES 17-24; Report EUR 11555 EN, Commission of the European Communities, Jt. Research Centre, Ispra Establishment, Italy (April 1988) (on file at the *Boston University International Law Journal*) [hereinafter BARAM E.C. REPORT].

participation in all systems for dealing with risk and thereby reduces the role of regulatory expertise, to the satisfaction of those who view traditional regulation as elitist or undemocratic. Thus, diverse interests view the one-step mode of risk communication as an important alternative to traditional regulation.¹⁴

A more restrictive view is held in the European Community. Instead of providing a "right-to-know," the Sixth Amendment and the Seveso Directive are being implemented on a "need-to-know" basis. From this narrower perspective, the one-step mode of risk communication is viewed as serving the purpose of providing only persons at risk with the information they will need in order to effectively participate in programs prepared by public officials for avoiding harm and responding to accidents.¹⁵

Despite these differences, both industrial societies are demonstrating a growing reliance on risk communication, an important trend in public policy which has considerable implications for private companies, public agencies and persons at risk from industrial technology.

II. SOME IMPLICATIONS OF RISK COMMUNICATION

The managers of industrial firms, whether producers and sellers of toxic and volatile materials, or "downstream" firms which purchase and use these materials, must carry out two basic functions when their firms' activities endanger the health of workers, product users, or community residents. The first function is to ensure continuous operation by complying with regulatory requirements to avoid agency enforcement actions, penalties, and shut down orders. The second is to prevent economic losses due to risk from impacting on their firms. The new policies are now addressing both functions.¹⁶

Thus, with regard to newly imposed one-step requirements for risk communication, managers must evaluate the disclosure duties and determine cost effective means of carrying them out, use available exemptions and waivers, protect trade secrets, and install new management and information systems to ensure compliance on a continuing basis. Carrying out the compliance function is frequently confounded by ambiguously worded requirements, complex agency instructions, a proliferation of state and even local laws which may conflict with federal or national laws, and shortcomings in the firm's organizational reliability. Nevertheless, regulatory compliance with risk communication duties is a tractable problem for well-managed firms.

¹⁴ See *id.*

¹⁵ See B. Wynne, Risk Communication in Europe: Ways of Implementing Art. 8 of the Post-Seveso Directive, (Draft of March 11, 1988) (intended for publication by the International Research Group on Risk Communication) (on file at the *Boston University International Law Journal*); see also BARAM E.C. REPORT, *supra* note 13, at 61-80.

¹⁶ See BARAM E.C. REPORT, *supra* note 13, at 6-15.

The second function of corporate risk managers, "loss prevention," is a decidedly more complex task.¹⁷ Here, the central question is always "how safe is safe enough" in managing hazardous activities, as inadequate safety can lead to economic loss which could have a severe impact on the firm. This is demonstrated both by the recent Ashland Oil and Sandoz Chemical spills and the continuing saga of litigation against Johns Mansville and other asbestos producers.

Regulatory compliance does not guarantee that a firm will completely eliminate risk and loss. For example, not all hazardous activities or substances are regulated; and those which are regulated may still cause health and safety risks even though firms achieve and maintain perfect regulatory compliance, since most regulations do not aim for total elimination of all risk. Thus, loss prevention is an independent consideration for corporate managers.

The losses that industry seeks to prevent consist mainly of those economic costs that would accrue from the risks not prevented by regulatory compliance. These costs include the liability and compensation awards to injured persons that would be imposed by the courts under private law doctrines (or alternatively, the costs of settling such claims), the fees for attorneys, experts and other transaction costs that would arise in dealing with the claims of injured persons, and potential consequential costs such as higher premiums for future insurance coverage. Other losses sought to be prevented by firms include harm to the firm's reputation, which can diminish industrial customer and public confidence in the firm, leading to loss of markets and competitive position, and a drop in the value of its shares.¹⁸

Because liability awards in the United States are notoriously frequent and extraordinarily high, firms doing business in the United States are making significant efforts to prevent risk and loss, in some instances going far beyond regulatory requirements. Firms doing business in the European Community similarly seek to avoid losses, primarily to maintain reputation, consumer confidence and market position. However, concern over litigation costs is now emerging as a promoter of loss prevention in the E.C. as well. The new E.C. Products Liability Directive provides for strict liability,¹⁹ and damage awards in the E.C. have been increasing under national laws. According to recent studies by insurers, awards in several European countries now run 50 to 60% of U.S. awards, on average, although the incidence of litigation in the United States remains much greater than in the European Community.²⁰

¹⁷ *Id.*

¹⁸ *Id.*

¹⁹ Council Directive on Approximation of Laws, Regulations and Administrative Provisions of Member States Concerning Liability for Defective Products (85/374/EEC), 28 O.J. EUR. COMM. (L 210/29) 1 (1985).

²⁰ See, e.g., P. Szollosy, The Standard of Compensation for Injury and Death in European Countries (address to the Association of Icelandic Lawyers and the Faculty of Law in Reykjavik, Iceland, Sept. 9, 1982).

Thus, loss prevention is the more complex and costly goal of corporate risk management. It is a discretionary but important function for firms producing or using hazardous materials. It involves risk and loss estimations, prudent business decisions as to how much shareholder money should be spent to reduce the estimated risks and losses, evaluation of the availability, pricing and terms of liability insurance, as well as moral considerations.

The new requirements for industrial communication of hazard information directly to persons at risk or their representatives are now having considerable influence on the corporate loss prevention function. This is reflected in the firms' increased vulnerabilities to critics and adversaries, and the increased potential for legal actions, increasingly stringent standards, public disfavor and economic losses. Vulnerability has increased even in the absence of actual harm, since perceptions of risk fed by hazard information disclosures can lead to litigation and other losses.

Although not required to do so by law, many firms in the United States and the E.C. are making stronger efforts to increase safety, reduce risk potential, and reduce public anxieties to pre-empt the potential controversies and losses which would otherwise follow from the newly required disclosures on hazard information. Thus, risk communication policies are having a forcing function on industry, forcing greater voluntary efforts to improve safety and provide for emergency response actions without the need for technical standards or other government regulatory actions.²¹

One-step risk communication requirements are also presenting new challenges to public agencies. Government officials must now review the flood of new hazard information from industry, inspect and evaluate the safety of diverse types of industrial facilities, develop and review complex emergency response programs, and secure cooperation from the workers or community residents who are the intended beneficiaries of these new risk-reducing efforts. They must interpret ambiguous hazard information for lay public consumption carefully, so as to induce constructive public involvement without inducing anxieties and mistrust. With limited resources and authority, they must now inspect and enforce corporate compliance, resolving controversies openly; deal with conflicting interpretations from the media and from the companies involved; and counter public skepticism. Agencies must therefore serve as the "learned intermediaries" of the risk communication process. Moreover, in the E.C. States, local officials are trapped between the public's demand for more information and the national govern-

²¹ The author is currently directing a study of corporate risk management responses under the federal "Emergency Planning and Community Right to Know Act (EPCRA)," *see infra*, note 45, at the Tufts University Center for Environmental Management under contract from the U.S. Environmental Protection Agency (EPA). Field research at various industrial facilities and corporate headquarters has led to preliminary findings as to a wide variety of company initiatives which have been stimulated by the disclosure requirements of EPCRA.

ment's ability to comply with the Seveso Directive without empowering local government.²²

The accidental release of methyl isocyanate from a Union Carbide facility in Bhopal, India, of dioxin from a Hoffman LaRoche facility in Seveso, Italy, and of radioactive isotopes from a Soviet nuclear power plant at Chernobyl, USSR, have had an enormous cumulative impact on public attitudes in all nations about modern industrial technology. Bhopal, in particular, vividly demonstrated the tragic consequences for human health that can follow from an accident at a modern chemical manufacturing facility. Over 2000 deaths and 200,000 alleged injuries have been recorded as a result of this accident. In addition, numerous lesser accidents at chemical facilities, such as the recent releases of toxic chemicals from a Union Carbide plant at Institute, West Virginia and from a Sandoz facility at Basle, have reinforced public concern about safety.

As a result, interest groups and many community leaders in the United States, West Germany, and other nations have led the movement for risk communication in order to independently evaluate the safety of industrial facilities and take precautionary or remedial actions, ranging from the development of emergency plans to the initiation of legal actions against companies. The new risk communication laws now provide some of the information sought, but pressures are mounting for industrial and local officials to provide more information and interpretation for public understanding. Many scholars are now studying the "processing" of newly acquired risk information by individuals and communities. Clearly, we are witnessing the beginning of a new era in industrial-community relationships, one which will produce controversies and conflicts in some instances, cooperation and complacency in others.

III. RISK COMMUNICATION IN THE EUROPEAN COMMUNITY

The centerpiece of European Community efforts at reducing accident hazards in the chemical industry is the "Seveso Directive,"²³ named after the city in northern Italy where an accident at a Hoffman LaRoche plant led to a large release of dioxin in 1978, contaminating the environment and causing substantial alarm over future health consequences for exposed persons.

The Seveso Directive orders the twelve Member States to implement national laws in conformance with its goals of reducing chemical accident risks in industrial plants and storage facilities, and formulating emergency response plans for communities where such facilities are situated. Although the Seveso Directive allows retention of previously enacted national safety

²² See generally Right to Know Planning Guide (BNA).

²³ See Seveso Directive, *supra* note 11.

and environmental laws, it sets minimum compliance levels for the Member States, evidence of its uniformity policy. Moreover, the Seveso Directive explicitly provides that Member States may adopt stricter regulations than are required.²⁴

The Seveso Directive sets forth a two-pronged program of accident risk reduction for manufacturing and storage facilities which have designated quantities of some 178 chemicals on site. First, it orders company officials to conduct on-site evaluation of accident risks and safety measures at their facilities,²⁵ which are reviewed by national officials, who can thereafter order additional safety measures and facility or process modifications to the extent allowed by national laws.²⁶ A company's evaluation involves applying safety and risk analysis methods to the chemicals and industrial systems at a given site. Since each site has unique features, standardization of evaluation procedures is not possible. For new facilities, the evaluation must be provided before the facility begins operation.²⁷ The Seveso Directive

²⁴ *Id.* art. 17, at 6.

²⁵ Seveso Directive, *supra* note 11. The Seveso Directive applies to any operation carried out in certain industrial or storage installations (defined in Annex I to the Directive) which involves or may involve "one or more dangerous substances" which are "capable of presenting major accident hazards." "Dangerous substances" are those listed in Annexes to the Directive, and "major accident" is defined as an occurrence such as a "major emission, fire or explosion . . . leading to a serious danger to man, immediate or delayed, inside or outside the establishment, and/or to the environment, and involving one or more dangerous substances." *Id.* arts. 1-2, at 2-3.

The evaluation to be furnished by plant officials is required to contain information on: (1) the substances, their quantity and uses, and their behavior under normal and abnormal conditions; (2) the installations, their location, prevailing meteorological conditions and sources of danger at the site, the number of persons working on the site and exposed to the hazard, the technological processes, sections of the establishment "which are important from the safety point of view," the hazards and conditions under which a major accident could occur, preventive measures, and technical means for assuring safe operation and coping with malfunctions; and (3) possible major accident situations, including safety equipment, alarms, in-plant resources for accident response, any information necessary for the competent authorities to prepare emergency plans for use outside the establishment, and names of officials responsible for safety and emergency response operations. *Id.* art. 5(1), at 3, 4.

²⁶ *Id.* art. 7, at 4.

²⁷ *Id.* arts. 5-6, at 4 (Article 5(2) states, "[i]n case of new installations, the [evaluation] must reach the competent authorities a reasonable length of time before the industrial activity commences." Furthermore, Article 6 requires that any "modification" of an industrial activity which could have significant consequences as regards major accident hazards must be similarly evaluated and conveyed to the competent authorities before the modification may be implemented.)

requires that the resulting report to national officials is to be kept confidential to avoid disclosure of proprietary information to competitors and others.²⁸

The safety evaluation (or "safety case")²⁹ generated by this process is sent by the firm to the "competent authorities" designated by the Member State in which the plant is located. The competent authority, an agency of the national government, must review the manufacturers' reports, may conduct on-site inspections, and may then use its authority (under national law) to order changes in plant facilities and systems at the manufacturers' expense.³⁰

The second step in the Seveso Directive's program requires the competent authority to ensure the formulation of off-site emergency response plans for the identified accident hazards, necessitating a prior off-site accident hazard analysis.³¹ The plans are to be developed by national and presumably also local officials with the cooperation of the industrial firms operating the facility sites. The off-site plan is to be designed to protect both public health and the environment in the event of a major release. It therefore includes evacuation plans, emergency health care measures, and strategies for swift action directed towards containment and reduction of the environmental threats posed by the release.³²

The Seveso Directive makes fundamental distinctions for purposes of information transfer between industry and national government, and between government and the general public. Industrial information is to be fully shared with the national government (the "competent authority") regardless of industrial proprietary interests. This enables a national agency to fully evaluate an industry's safety case and benefit from the industry's unique knowledge of its facility, without bearing the costs of the risk evaluation or encountering industrial obstruction of government evaluation.³³

Information is thereafter made available by the national authority to local governments, employees, and the general public, on the basis of what they "need to know." This standard permits selective transmittal of information to these groups based on their function. Thus, local government may be given only enough information to carry out its duties to formulate community emergency response plans, and the public given only what they need to know to properly respond to emergencies.³⁴

²⁸ *Id.* art. 13(1), (3) and (4), at 5-6.

²⁹ In the Seveso Directive, such safety evaluations are termed "notifications." See Seveso Directive, *supra* note 11, art. 13, at 5-6. In the United Kingdom, such evaluations are known as "safety cases."

³⁰ Seveso Directive, *supra* note 11, art. 7, at 4.

³¹ *Id.*

³² *Id.*

³³ *Id.*

³⁴ The Directive requires only that "Member States shall insure that persons liable to be affected by a major accident . . . are informed in an appropriate manner of the safety measures and of the correct behavior to adopt in the event of an accident."

The Seveso Directive leaves further information distribution to the individual Member States. In the United Kingdom, debate continues as to whether the manufacturer should disclose risk information directly to the public (in consultation with the local authorities), or whether such information should be made available solely by local or national government. National action must resolve this issue, because the Seveso Directive provides no guidance.³⁵ The absence of full public disclosure requirements in the Seveso Directive is characteristic of the E.C.; public reliance is placed on the good faith efforts of civil servants working in confidential relationships with industry, as opposed to American open proceedings and reliance on litigation to resolve problems.

According to a recent study by Professor Brian Wynne, the Member States of the E.C. are at varying stages in implementing the Seveso Directive. The few countries that have given notification of substantial implemen-

Id. art. 8, at 4. Brian Wynne of the Centre for Science Studies and Science Policy at the University of Lancaster, discusses the United Kingdom's list of requirements with respect to information that must be transmitted to the public under Article 8 of the Seveso Directive. These minimal list requirements, reflecting a "need to know" philosophy consist of the following:

- a) Name of company and address of site.
- b) Identification, by name and position, of person giving the information.
- c) Confirmation that the site is subject to the current regulations and/or administrative provisions concerning the industrial activities and that Competent Authority has been notified.
- d) An explanation in simple terms of the activity undertaken on the site.
- e) The common names (where possible) of the substances involved on-site which would give rise to a major accident, with an indication of their principal harmful characteristics.
- f) Details on how the population concerned will be warned in case of accident.
- g) General advice on the actions and behavior members of the public should take on hearing the warning system.
- h) An assurance that the company has made adequate arrangements on-site, including liaison with the emergency services, to deal with foreseeable accidents and to minimize their effects.
- i) A reference to the off-site emergency plan drawn up to cope with any off-site effects from an accident. This should include strong advice to co-operate with any instructions or requests from the emergency services at the time of an accident.
- j) Details of where further information can be obtained.

Wynne, Draft of presentation to the Annual Meeting of the Society for Risk Analysis, "Risk Communication for Chemical Plant Hazards in the European Community 'Seveso Directive'—Some Observations Based on Comparative Empirical Studies" (Nov. 11, 1986) (on file at the *Boston University International Law Journal*).

³⁵ See Seveso Directive, *supra* note 11, art. 8.

tation are ones which had previously existing industrial accident safety regulations, such as the United Kingdom and the Netherlands.³⁶

Professor Wynne's study, now in progress, focuses on the implementation of Article 8 of the Seveso Directive. Article 8 provides, in part, that "member nations shall ensure that persons liable to be affected by a major accident . . . are informed in an appropriate manner of the safety measures and of the correct behavior to adopt in event of an accident."³⁷

Article 8 thus deals with the critical issue of what information is provided to the public. Professor Wynne's main findings about how 12 different nations are implementing the Seveso Directive and construing Article 8 are reported elsewhere in these proceedings.

Although the Seveso Directive may have limited influence on industrial risk communication with the public, it is forcing firms to improve other elements of their risk management programs, according to trade association and chemical industry officials. These changes in risk management include corporate staffing and allocation of fiscal resources (e.g. new personnel, funds for safety, analysis and compliance); corporate management structure (e.g. coordination of purchasing and other functions to reduce on-site quantities of the dangerous chemicals listed by the Seveso Directive); and engineering safety functions (e.g. use of more protective safety factors to assure that capacities of equipment are not exceeded). Overall, safety management has been more assertive and coherent.³⁸

Hailed as a model by many, the Seveso Directive has influenced legislation in the United States and has been used by the World Bank in promoting safe industrial development in the Third World.³⁹ These positive responses

³⁶ See generally Wynne, *supra* note 34 (discussing and comparing implementation of Article 8 of the Seveso Directive in the United Kingdom, the Netherlands, and France).

³⁷ Seveso Directive, *supra* note 11, art. 8(1), at 4.

³⁸ Other changes in risk management include: training and education of workers (e.g. for emergency response on-site and off-site); process improvements (e.g. use of substitute products, process changes which enable reduction of quantities of dangerous chemicals needed to be kept on site); research to identify limitations in accident prevention systems (e.g. reliability testing of equipment); planning for contingencies with community officials (e.g. plans and exercises for containing releases, and responding to accidents); relations with community (e.g. public relations and more specifically, involvement with local officials for developing emergency response plans); manufacturer transfer of safety expertise and other assistance to their industrial customers downstream (e.g. providing them with new information on safe handling and storing the chemicals purchased) to facilitate customer compliance with the Directive and other accident reduction efforts, and to thereby also keep customers.

³⁹ See Note, *Chemical Plant Safety Regulation: The European Example*, 16 LAW & POL'Y INT'L BUS. 621 (1984); M. Baram, *Chemical Industry Accidents, Liability and Community Right to Know*, *supra* note 9. See also WORLD BANK, *APPROACH*

are based on the perception that the Seveso Directive presents a workable model for promoting improved safety practices in industry, for linking industry and government expertise in partnership, and for stimulating new and voluntary forms of risk analysis and management. However, on the basis of early evaluations, uniformity of safety practices now seems an impossible goal, and the influence of the Seveso Directive on risk communication with the public has thus far been contextual and weak.

IV. RISK COMMUNICATION IN THE UNITED STATES

Over 6900 accidents involving the release of "acutely toxic substances" occurred in the United States from 1980 to 1985. These accidents resulted in 138 deaths and 4,717 injuries, required temporary evacuation of some 217,000 people, and led to other consequences yet to be measured (including latent disease risk, environmental contamination, and emotional distress). In addition, such accidents are believed to have had an average estimated cost of \$30 million each (in 1984 dollars) with one accident resulting in more than \$100 million in estimated damages. Of the 200 different substances released in the events, four high volume, industrial chemicals (chlorine, ammonia, sulfuric and hydrochloric acids) were involved in 25 percent of those causing deaths.

Seventy-five percent of these accidents occurred in-plant, accounting for 65 percent of the events causing death or injury. The remainder of the episodes took place during transportation. The chemical and allied products industry and the petroleum refining industry together account for 34 percent of the injuries and more than half of the deaths. Other industries that use or store toxic chemicals or fuels account for about 25 percent of the deaths and injuries.

These are the early findings of a continuing study by the U.S. Environmental Protection Agency (EPA),⁴⁰ and demonstrate that accidents involving chemicals are a ubiquitous and significant problem in the United States despite numerous federal, state and local laws and regulations which have

TO CONTROLLING MAJOR HAZARDS IN THE CHEMICAL INDUSTRY: GUIDELINES FOR IDENTIFYING, ANALYZING AND CONTROLLING MAJOR HAZARD INSTALLATIONS IN DEVELOPING COUNTRIES 1 (Sept. 1985) ("These guidelines are based substantially on the EEC Directive . . .") The World Bank's Guidelines have in turn provided the basis for a joint effort. WORLD BANK & TECHNICA LTD., WORLD BANK MANUAL OF INDUSTRIAL HAZARD ASSESSMENT TECHNIQUES (Oct. 1985). For developments in the United States following the European Community's adoption of the Seveso Directive, *see infra* Part IV of this article.

⁴⁰ *See* INDUSTRIAL ECONOMICS, INC., EXECUTIVE SUMMARY, IN ACUTE HAZARDOUS EVENTS DATABASE (Report for U.S. E.P.A. No. EPA 560-5-85-029) (Dec. 1985). For further information on transport accidents not dealt with in this study, *see* OFFICE OF TECHNOLOGY ASSESSMENT, U.S. CONGRESS, TRANSPORTATION OF HAZARDOUS MATERIALS (July 1986).

been in effect for decades. These results, together with the occurrence of major accidents at Bhopal and Three Mile Island, and other reports of industrial accidents on virtually a daily basis,⁴¹ have led to strong public support for tough new laws in the United States to prevent accidental releases, promote emergency response planning, and to give local officials and community residents access to company risk information on a right-to-know basis.

This growing pressure has forced Congress, state and local legislators, agency officials, industrial firms and trade associations to act. For example, in 1985, EPA developed and widely disseminated a guidance document for state and local officials and company managers entitled *Chemical Emergency Preparedness Program (CEPP): Interim Guidance* even though it was without clear legal authority to regulate plant accident risks. CEPP was based on several elements of the Seveso Directive and derivative developments at the World Bank.

At the same time, the chemical industry's major trade association came forth with its *Community Awareness and Emergency Response Program* (CAER), to demonstrate its willingness to share certain types of risk information (the Material Safety Data Sheets (MSDS) disseminated to workers under the OSHA Hazard Communication rule) with communities where chemical facilities were located. Developed by the Chemical Manufacturer's Association (CMA), CAER represented an about-face for the chemical industry which had traditionally opposed such information transfer. Major chemical producers (e.g. Dow Chemical) also voluntarily began to re-evaluate safety at their facilities and impose more stringent measures to prevent accidents and reduce quantities of chemicals stored on site.

These efforts by EPA and industry, and the existence of numerous federal risk reporting and permit requirements in regulatory programs,⁴² did not deter states and municipalities from acting as well. By late 1986, over 20 states and hundreds of municipalities had enacted new laws and regulations for emergency response planning and risk communication, reinforcing their

⁴¹ See, e.g., ENVIRONMENTAL PROTECTION BUREAU, OFFICE OF ATTORNEY GENERAL OF NEW YORK STATE, REPORT OF JOINT PUBLIC HEARINGS ON TOXIC CHEMICAL ACCIDENTS IN NEW YORK STATE (June 18, 1986).

⁴² CEPP was published by EPA in November 1985 and an estimated 20,000 copies were distributed over the next month. CAER information, such as the CAER, 1986 PROGRESS REPORT, is available from the Chemical Manufacturer's Association, Washington, D.C. Numerous federal regulatory programs provide for risk communications to consumers of products, workers and the general public. See Technical Resources, Inc., Preliminary Draft Inventory of Federal Risk Communication Programs, presented at Workshop on the Role of Government in Health Risk Communication and Public Education (Jan. 21-23, 1987) (on file at the *Boston University International Law Journal*). See also M. Baram, *Risk Communication and the Law for Chronic Health and Environmental Hazards*, 8 ENVIRON. PROF. 165-78 (1986) (discussing operational emissions from industrial facilities).

traditional legal requirements for community safety, such as fire marshal inspection and licensing of petroleum installations and health officer authority over activities which present health risks to the community.⁴³ Some citizens' groups were successful in seeking action by local officials to close industrial facilities which used toxic chemicals.⁴⁴ The culmination of these developments was Congressional enactment of the federal Emergency Planning and Community Right to Know Act ("EPCRA") in October, 1986.⁴⁵

EPCRA requirements for emergency planning and risk communication are allocated among federal, state and local governments and industry. These requirements are set forth in sections on emergency planning, emergency notification, community right-to-know reporting, and toxic chemical release and emission inventory reporting.⁴⁶

The *emergency planning* section provides for a new state administrative structure. It requires the governor of each state to designate a state emergency response commission. This commission, in turn, must establish local emergency planning districts within the state and local emergency planning committees (LEPC's) to develop emergency plans for these districts based on industrial risk information. The state commission supervises the LEPC's, especially with regard to their handling of public requests for information and their development of emergency response plans.⁴⁷

⁴³ For a review of these developments through early 1986, see M. Baram, *Chemical Industry Accidents, Liability and Community Right to Know*, *supra* note 9.

⁴⁴ Citizens of Cambridge, Mass. succeeded in shutting down a special research laboratory at the A.D. Little Co. where research on detoxification of chemical warfare agents was being conducted under U.S. Department of Defense contracts. The city's health officer issued a shut-down order later justified by a risk assessment which concluded that risk to citizens from an accidental release was very remote but nevertheless possible. This order was appealed by the firm, but was upheld by state courts on the grounds that there was a reasonable basis for the order. See *A.D. Little v. Comm'r. of Health of Cambridge*, 395 Mass. 535, 481 N.E.2d 441 (1985).

⁴⁵ The Federal law is Title III of the Superfund Amendments and Reauthorization Act of 1986 (SARA), Pub. L. No. 99-499, 100 Stat. 1613, 1728 (1986). Title III of SARA is designated as the Emergency Planning and Community Right-to-Know Act of 1986, 42 U.S.C. §§ 11001-11050 (Supp. IV 1986) [hereinafter EPCRA]. The genesis of this law began with the proposal of Congressman James Florio of New Jersey in 1985 for enactment of a federal program for licensing chemical firms. This controversial approach, contained in his bill, H.R. 965, 99th Cong., 2d Sess., 131 CONG. REC. 327 (1985) ("Chemical Manufacturing Safety Act"), was rejected.

⁴⁶ See U.S. EPA, TITLE III FACT SHEET (1987).

⁴⁷ *Id.* See also EPCRA, *supra* note 45, 42 U.S.C. §§ 11001-11003. To assist local communities, EPCRA requires preparation of federal interagency guidance and other materials. Said guidance was published in March 1987, NATIONAL RESPONSE TEAM OF THE NATIONAL OIL AND HAZARDOUS SUBSTANCE CONTINGENCY PLAN, HAZARDOUS MATERIALS PLANNING GUIDE (Mar. 1987). State commissions are listed in *State Commission Contacts*, 1 COMMUNITY RIGHT TO KNOW NEWS (Special Supp.) (June 8, 1987).

According to the federal law and EPA's subsequent regulatory actions, "planning activities of the local committees and facilities should be focused on, but not limited to . . . extremely hazardous substances" which have been published on an official list, with threshold quantities, developed by EPA.⁴⁸ Any facility that produces, uses or stores any of the 402 listed chemicals in a quantity exceeding its threshold amount becomes subject to emergency planning requirements and must notify the state commission of this fact. The state must then notify EPA of all facilities subject to the planning requirements.

Emergency notification procedures, set forth in (42 U.S.C.) Section 11004, require a facility to immediately notify the LEPC and state commission if there is any accidental release of a listed substance beyond a specified reportable quantity threshold. Two substance lists must be considered in complying with this requirement: the list of "402 extremely hazardous substances" and other substances listed as being subject to emergency notification requirements under federal hazardous waste law.⁴⁹

Community right to know reporting requirements are imposed on manufacturers and importers. Section 11021 requires facilities to have Material Safety Data Sheets (MSDS's) (required by the OSHA Hazard Communication Rule) available for the designated chemicals in their facilities, and to submit these MSDS's (or a list) to the local committee (LEPC), the state commission and the local fire department. Section 11022 requires these firms to also provide the same three units of state and local government with an annual "emergency hazardous chemical inventory form," setting forth estimates of the maximum amount of the designated chemicals at the facility at any time over the preceding calendar year, their average daily amount, and their general location. Upon request of any state and local recipients, the manufacturer or importer must also provide additional detailed information including chemical or common names, their manner of storage, and their on-site location. However, the firm may petition to have these recipients withhold storage location information from the public.⁵⁰

⁴⁸ This list, which contains the E.C.'s Seveso list of 178 substances, was developed by EPA and published at 51 Fed. Reg. 41, 570 (1986), under the authority of section 302 of EPCRA. "Threshold planning quantities" for each substance on the list are provided by the EPA. Screening criteria used by the EPA in developing the list "are basically consistent with . . . criteria used by both the European Economic Community and the World Bank. However, the Agency has adopted a more conservative approach by modifying the selection criteria . . ." *Id.* at 41, 574.

⁴⁹ See EPCRA, *supra* note 45, at 42 U.S.C. § 11004, which sets forth the information to be provided, and 40 C.F.R. § 335 which sets forth the implementing regulations. The second list is that provided by the EPA in regulations codified at 40 C.F.R. § 302, Table 302.4 (1988) and authorized pursuant to Section 102(a) of the *Comprehensive Environmental Response Compensation, and Liability Act of 1980* (CERCLA) 42 U.S.C. §§ 9601-9675 (1982 & Supp. IV 1986).

⁵⁰ 42 U.S.C. §§ 11022-11023 (Supp. IV 1986). EPA has published a uniform format for the inventory forms. 52 Fed. Reg. 2836 (1987) (to be codified at 40 C.F.R. § 370).

Finally, section 11023 provides for yet another "reporting requirement," the "*toxic chemical release and emissions inventory report*." This annual report covers operational or routine emissions of toxics from the facility (accidental releases are reported under section 11004, discussed earlier). It is submitted to EPA and state officials by facility owners who manufacture or process any chemicals designated on a special list of some 300 toxic chemicals, in certain quantities set by EPCRA (e.g., over 25,000 pounds a year after July 1989). EPA, in turn, is required to store this information in a computer data base and to develop a "national toxic chemical release inventory," available through computer access to any person, subject only to trade secret restrictions.⁵¹

This enormous flow of paperwork in the form of reports between industry and three levels of government is now governed by EPA implementing regulations and four separate lists of toxic chemicals. The EPA may afford trade secret protection for the specific identity of a hazardous chemical if the firm presents sufficient information required by EPCRA to justify this restriction on information dissemination to the public.⁵²

Public access to all of these reports is *guaranteed* by the Act. Section 11044(a) provides that:

Each emergency response plan, material safety data sheet . . . inventory form, toxic chemical release form, and follow-up emergency notice shall be made available to the general public, consistent with section 11042 [on trade secrets] . . . by the [EPA] Administrator, Governor, State emergency response commission, or local emergency planning committee, as appropriate . . .⁵³

Local committees are further required to annually publish notice in local newspapers of the information they have received to inform the public of its access rights and alert them to available information.⁵⁴ Thus, EPCRA marks a major commitment to the public right-to-know principle.

EPA's Office of Pesticides and Toxic Substances (OPTS), the Federal Emergency Management Agency, and other federal programs and agencies

⁵¹ 42 U.S.C. § 11023 (Supp. IV 1986). EPA is further required to use the data in conducting a mass balance study as defined by section 11023(L)(4) to account for chemicals as they are used in facility processes. EPA's proposed forms and rules for industry reports are set forth in 52 Fed. Reg. 21152 (1987) (to be codified at 40 C.F.R. § 372).

⁵² 42 U.S.C. § 11042 (Supp. IV 1986). Even if trade secret protection criteria are met, section 11043 provides for disclosure of chemical identity to "health professionals" under certain circumstances (for medical diagnosis or public health assessment activities), provided the recipients sign a confidentiality agreement. *See also* 42 U.S.C. § 11022 (Supp. IV 1986) (regarding withholding information on on-site locations of certain chemicals following a firm's request).

⁵³ 42 U.S.C. § 11044(a) (Supp. IV 1986).

⁵⁴ 42 U.S.C. § 11044(b) (Supp. IV 1986).

are doing research and developing guidelines and rules to further implement EPCRA, consistent with the mandate of their own authorizing legislation. Since EPCRA does not consolidate or reconcile conflicting and duplicative mandates of other federal agencies, nor does it pre-empt the numerous and proliferating state and local laws pertaining to accident prevention and emergency responses,⁵⁵ the United States is now awash in new reporting requirements.⁵⁶

But EPCRA is hollow at the core. Missing from the extensive array of communication duties is any authority for anyone, agency or industry, to do a rigorous, site-specific facility safety analysis, as required by the E.C.'s Seveso Directive. The Seveso Directive imposes this duty on industry and provides for review of the resulting "safety case" by national officials.

By not imposing a duty to carry out this critical function, EPCRA implicitly relies on potential public pressure, aroused by disclosures of hazard information, to force state and local officials to inspect, evaluate and regulate facilities. EPCRA further relies on industry's fear of this scenario, with its attendant costly controversies and litigation, to force industry to voluntarily evaluate the safety of its facilities and to take measures to improve safety to mitigate public pressure and pre-empt such scenarios.⁵⁷

Therefore, EPCRA shifts the forcing function for evaluating and improving plant safety from the federal government to state and local governments, industry, and the public.⁵⁸ This shift reflects the Reagan administration's "new federalism" doctrine for shrinking the national government's role (and budget) in public affairs (other than in military matters). In this light, risk communication is a surrogate for federal safety regulation and responsibility, one which does not enlarge federal bureaucracy, but which depends on

⁵⁵ 42 U.S.C. § 11041 (Supp. IV 1986) stipulates that it does not preempt any state or local law, but that new state and local laws which require MSDS's must assure that their MSDS content and format are identical with the MSDS requirements of 42 U.S.C. § 11021(a).

⁵⁶ The flow of paperwork looms large. The 33,000 fire departments in the United States, of which 30,000 are staffed by volunteers, are expected to receive up to 20 million documents on some 50,000 hazardous chemicals by the end of 1987, due to EPCRA alone. *See supra* note 21.

⁵⁷ Current research on corporate responses to EPCRA indicates that this reliance is justified. *Id.*

⁵⁸ However, EPCRA also establishes civil and criminal penalties as part of an enforcement system to be conducted by EPA, 42 U.S.C. § 11046 (Supp. IV 1986). It also provides for "citizen suits" to enforce the Act by means of actions brought in U.S. District Court against the owner or operator of a facility for failure to submit MSDS's list under 42 U.S.C. § 11021(a), to complete a generic inventory form under § 11022(d)(1), to submit follow up emergency notice under § 11004(c), or to submit emission inventories under § 11023. Citizen suits can also be brought against EPA and the states for failures in implementing various Sections of the Act. Finally, the Act authorizes states and local communities to sue firms and EPA for failing to meet various requirements. 42 U.S.C. § 11046(b)(2).

potential conflicts in local communities, tort actions in state courts, and the threat of such events as a motivator for firms to voluntarily evaluate and improve safety at their facilities.

In the litigious U.S. system, this model may work, since the assumptions on which it is based are realistic. Firms which file reports under EPCRA envision at least three scenarios which pose considerable potential losses unless they voluntarily act ahead of time to improve their risk management and facility safety:

- (a) use of local authority over land use and community health and safety by community residents in possession of new information (from the reports filed under the Act) to force changes in facility processes, safety measures, chemicals used and stored, or to force a shutdown of the facility to prevent unacceptable accident risks;⁵⁹
- (b) use of the newly acquired information by community residents to initiate nuisance and other tort actions in state courts to secure injunctions or restraining orders which would dictate changes in the industrial activity, or even its temporary or permanent shutdown;⁶⁰ and
- (c) following an accident at a facility, use of the risk information in tort actions by injured residents to prove industrial fault or unreasonably dangerous activity and, in some instances, to prove disease or injury causation to secure compensation, punitive damages, and other remedies such as facility disclosure.⁶¹

⁵⁹ The Act does not preempt state and local authority. Citizens may seek and secure use of the "police powers" of such authorities to force modifications and even shutdowns, under applicable state and local laws. A vivid example, provided before enactment of EPCRA, is the shutdown of A.D. Little's chemical warfare agent research laboratory by the health commissioner of Cambridge, Massachusetts. *See supra* note 44. Another recent shutdown is described in *Suffolk Chemical Co. to Close Plant Under Consent Order with State Agency*, *Toxics L. Rep.* (BNA), No. 40 at 1155 (Mar. 18, 1987).

⁶⁰ Provision of injunctive relief or restraining order by a state court is rarely available in American tort law when the defendant is a firm whose operations are of economic value to the community. *See e.g.* *Boomer v. Atlantic Cement*, 26 N.Y.2d 219, 309 N.Y.S.2d 312, 257 N.E.2d 870 (1970) (denial of petition to shut down cement plant in N.Y. state). Nevertheless, in some situations, such relief has been provided. *See e.g.* *Spur Industries v. Del Webb Development Co.*, 108 Ariz. 178, 494 P.2d 700 (1972).

⁶¹ Such actions would be based on negligence or strict liability theory, or both, depending on state law. The general rule in negligence theory is that a defendant owes a duty of care to avoid harm to all persons whose exposure to risks created by the defendant's activities is reasonably foreseeable by a prudent person with the defendant's expertise. Strict liability theory is available, in various forms, in many states: e.g. "per se liability," under which a court instructs the jury that the standard of defendant's conduct has been set (usually by statute), so that the plaintiff need show only violation of the statutory standard, membership in the class of persons to be protected by the statute, and injury arising from the defendant's breach of the

As a result of these conflict scenarios with their foreseeable potential losses for firms, many company risk management programs are being revised to not only assure compliance with the reporting requirements of the Act, but also to go beyond compliance by reducing accident risks on a voluntary basis. For example:

Firm A, an intermediate producer of chemical mixtures, is considering the reorganization of its decentralized management system in order to achieve better control of the chemicals it purchases, stores and uses.

Firm B, a primary producer of radioactive chemical substances, built a new laboratory and immediately took steps to assure the community and allay public anxieties by holding several open meetings at the facility.

Firm C, an end user of numerous highly toxic chemicals in making products for the computer industry, is planning to reduce its inventory of EPCRA-listed chemicals below reportable quantities, and thereby reducing risks and potential controversies with its community, while decreasing its regulatory reporting burdens.

Firm D, another end user of toxic chemicals in the electronics industry, has voluntarily conducted a study of reproductive problems of its workforce and released the primary findings. It has also staged an open house at its newest facility to establish good relations with community residents.

Firm E, one of the largest primary producers of chemicals, is conducting safety audits and risk assessments at each of its facilities, and modeling gas cloud dispersions under various accident scenarios, in order to improve its accident prevention and emergency response systems.

Firm F, another large primary producer, has conducted a detailed analysis of safety systems used at its numerous facilities, modified them and restructured its management.

Firm G, another large primary producer with many facilities in the United States and abroad, is concentrating on establishing more effective "partnerships" with local community leaders and public groups to strengthen joint efforts at emergency response and post-accident loss control. It is also developing "expert systems" (applications of artificial intelligence in computer software) to guide emergency response at its facilities.

Firm H, a large petrochemical firm, hired a major technical consulting firm to conduct risk analysis of its own activities (which range from offshore drilling to the production of pesticides and various plastics) as well as the generic types of activities conducted by its "downstream" product purchasers, in order to identify significant accident hazards. It

standard. Failure to warn is another frequently relied on basis for tort action in the United States, and a firm's duty to warn is not necessarily discharged by its compliance with applicable statutes and regulations (e.g. Title III (EPCRA) reporting requirements).

followed this up with a legal analysis of its potential liability and other losses. The results are being used to determine expenditures for new measures to reduce accident hazards.

Firm I, one of the leading chemical manufacturers in the world, has drastically reduced storage quantities of designated chemicals at all of its facilities, and developed a new set of safety standards for all facility managers to follow.

These actual developments at some major firms illustrate the variety of corporate initiatives now being taken voluntarily to prevent accidents, improve emergency response, and influence public perception, thereby reducing liability and other losses and regaining the confidence of their insurers and communities. They represent an intensification and proliferation of initiatives which began in the time span between Bhopal (December, 1984) and enactment of EPCRA (November, 1986).

Since controversies can be activated without actual injury or expert findings of increased risk, and only on the basis of perceived risk claims, many firms are now trying to shape or influence community perceptions about the reported information and the facility's accident risk potential, particularly fear of chronic disease from the routine releases of large amounts of toxic chemicals now being reported by firms under EPCRA's Section 11023 requirements. The most effective public relations approach may be to build confidence in the firm as a responsible and responsive member of the community to achieve communication credibility.

Thus, reliance on EPCRA, which in turn relies on potential threats of conflict to force improved safety measures, is a fortuitous proposition which will depend on many variables, producing highly diverse outcomes across the nation. It will take several years to determine if EPCRA works sufficiently, and to determine whether its unstructured approach to safety poses sufficient threat to industry so that firms will voluntarily improve risk management and prevent accidents consistent with the safety agendas of community residents.

V. CONCLUSION

Risk communication policies are being increasingly adopted in the E.C. and the United States. Supported by diverse interests, risk communication is seen by some as a means of empowering the public, and by others as a means of achieving risk reduction without burdensome technical standards and enlargement of regulatory bureaucracies. Firms must comply with these risk communication policies, and face the larger challenge of how to deal with the loss implications of risk communication. The loss implications are those which arise from industrial disclosures of risk information to national and local officials and the public, disclosures which may create anxieties and lead to regulatory interventions and the use of local authority and lawsuits to change or terminate corporate activities. Loss of trade secret information to

competitors also remains a persistent fear of company officials. Thus, risk communication is seen by industry as a device which increases economic vulnerability, and many large firms are giving serious consideration to improving their risk management programs for loss prevention so that they fully address this increased vulnerability.

Industrial accident risk problems have received much attention since Seveso and Bhopal, which highlighted the need for improved safety in company activities and improved emergency response systems in firms and their host communities. In the E.C., the Seveso Directive has clearly established corporate duties to assess facility safety and disclose this information to national officials. The flow of information to national officials becomes constricted, however, as it moves down to local officials who bear the primary burden of developing emergency plans, and is constricted much further as information is provided to the community solely on a need-to-know basis to enable residents to comply with emergency response plans.

These constrictions are due to strong industrial concerns about trade secrets and public misinterpretations of risk information, cultural traditions, and national laws which impede full disclosure to the public. Thus, Seveso provides for a relatively limited flow of information to local officials and the public, but by doing so provides a basis for good confidential communication between industry and national officials. Firms communicating with the public of their own volition have also tended to imbed risk information in the larger communication context of company public relations; in the United Kingdom and the Netherlands, at least, the public has acquiesced in the resulting practices.

EPCRA, the recently-enacted U.S. Community Right to Know law, and numerous state and local laws designed to deal with improving company safety and local emergency planning, have emphasized a multitude of industrial disclosure duties and promised broad public rights to know industrial information. Thus, firms are filing numerous reports with agencies, knowing that public access to this information is legally guaranteed, except for narrowly-drawn trade secret restrictions.

Although it is too early to assess these developments, public access rights in the United States are likely to constrict the quality or substantive content of corporate disclosures, and intensify the defensive communication views of many corporate risk managers, since the new information reaching the public is likely to lead to local conflicts and costs. This is particularly true as the federal law does not impose a duty to evaluate plant safety on the firm or on any of the information-receiving agencies, and leaves the matter of defining an acceptable safety level to resolution by other means such as public pressure and litigation.

This approach, though unsystematic, may produce increased safety at those plants particularly vulnerable to potential conflicts, as managers voluntarily improve safety to pre-empt costly conflicts with the public. Risk managers and trade associations are now at work achieving better control of

in-plant safety, and also grappling with various means to communicate without arousing community anxieties or consequent conflicts.

Each system has its benefits and limitations. The E.C. system fails to empower the public, but guarantees company safety analysis and expert-driven plans for emergency response by firms and officials. The U.S. system empowers the public and provides for local plans with public involvement, but fails to assure that facility safety will be addressed in any manner other than by fortuitous conflicts. Neither will achieve uniformity. Member nations in the E.C. take different approaches to the Seveso Directive implementation based on their cultural attitudes and institutions, and American states and communities enact diverse laws which are not pre-empted by the federal law, and which shape safety and emergency planning in their jurisdictions beyond EPCRA requirements.

Thus, in the shadow of Bhopal and Seveso, and beset by technical uncertainties and expert jargon, we are now embarking on the uncharted waters of risk communication as an alternative to technical standards, licensing and other forms of expert regulation in the United States, and as a supplement to such regulation in the European Community.