

88-120.1

RISK COMMUNICATION ON THE COMMUNITY LEVEL EUROPEAN EXPERIENCES
FROM THE SEVESO DIRECTIVE

ORTWIN RENN

CLARK UNIVERSITY
WORCESTER, MASSACHUSETTS



**For Presentation at the
81st Annual Meeting of APCA
Dallas, Texas
June 19-24, 1988**

Introduction

Over 6,900 accidents involving the release of acutely toxic substances occurred in the US from 1980 to 1985 (Baram 1987, p. 82). As a result of these accidents 138 people lost their lives and 4,717 were injured. More than 200,000 people had to be evacuated temporarily. The overall damage in terms of Dollar values has been estimated to exceed 2.1 billion US Dollars.

Accidental release of toxic substances is therefore a serious threat to human health and economic values. Risk management efforts are required to assure that the probability of an accidental release is reduced to an acceptable level, that the magnitude of potential damage is restricted to a manageable dimension, and that post-accident consequences are mitigated through appropriate health care and emergency control measures. The problem of how to determine an acceptable level of risk, of how to define the limits of a social system to cope with catastrophic events, and how to evaluate the appropriateness of the envisioned mitigation measures, cannot be resolved by scientific reasoning or legal rules alone, but requires value judgments and deliberate decisions about tradeoffs. In democratic societies, tradeoffs between conflicting values and goals should rely on the preferences of those who are directly or indirectly affected by the decision. The involvement of affected citizens implies, however, a continuous communication process between the operators of hazardous facilities, local and regional authorities, and the affected public. Thus risk communication is mandated by the political imperative in industrial democracies, since the democratic system is premised on the exercise of choice by an informed citizenry in elections and other public decision processes (Baram 1987, p. 18).

Beyond the legitimation effect of risk communication for managing and monitoring hazards, the moral mandate of essential fairness and justice requires that a person or entity conducting a hazardous activity has the responsibility to take reasonable measures to prevent harm to others and to inform them about the risks to which they are exposed as a result of these activities (Baram 1987, pp. 17 and 18). Both obligation, preventing harm and informing the citizens, are interrelated, since the level of prevention may be determined in a dialogue between the three major actors (operating company, regulator, affected public).

This dialogue also assists in meeting an additional mandate of risk communication, i.e. giving the affected citizens advice about protective actions in the case of emergencies and develop a system of disaster warning which will be effective to control and mitigate the consequences of an accident (Miletti, Sorensen, in press; Covello et al. 1986). The mandate of risk reduction requires a communication flow between the facility operators, emergency management agencies, and affected citizens prior to any accidents.

It includes the incorporation of communicative feed-backs about likely behavioral responses, organizational flaws, and other problems so countermeasures can be designed as a means to minimize the negative outcome of a hazardous event.

Communication about protective actions and behavioral responses relies on trust and credibility of the risk management institutions (Keeney and von Winterfeldt 1986). If the affected population does not believe that the risk managers are predominantly interested in preventing harm from the residents, protective actions may not be taken, overreactions may occur, or substitute actions are chosen which might be counterproductive. Hence, one may postulate a mandate due to psychological imperative since risk communication is seen as a necessary societal response to individual and group fears of technology, and confusion, distress and controversy over its uncertain impacts and to the need for risk managers to be trusted in an emergency situation (Baram 1987, p. 20).

In summary, risk communication on the community level serves four major mandates:

- o The political purpose of legitimizing residual and acceptable risk;
- o The moral purpose of giving affected persons knowledge about the risks to which they are (usually involuntarily) exposed;
- o The efficacy purpose of using communication to implement protective actions and therefore minimize the neagtives outcomes of adverse effects;
- o The psychological purpose of creating trust and confidence in emergency management and risk handling agencies.

In spite of the vital functions of risk communication on the community level, the legal requirements for risk communications in the US were rather fragmented and isolated prior to 1986. Although by late 1986, over twenty states and hundreds of municipalities had enacted new laws and regulations for emergency response planning and risk communication, federal legislation to initiate and enforce risk communication on the community level was not promulgated until the Superfund Amendments were passed in the same year (Baram 1987). Under Title III, Superfunds Amendments and Reauthorizatoin Act of 1986 (SARA) Public Law 99-499, communities were granted the right to know about hazardous facilities, risk management efforts, and emergency planning. SARA III includes the following requirements for risk communication:

- o Joint emergency planning (local emergency planning districts with committees consisting of different stakeholder groups);

- o Inventory form (report system on hazardous materials, their handling, toxicity, dispersion parameters, etc.);
- o Community right to know reporting requirement (routine emissions);
- o Emergency notification (accidental emissions, emergency management provisions, protective actions and others).

Since only two years have passed since the promulgation of SARA III, experiences with the implementation and success of this new legislation are still limited. Therefore it might be helpful to study the effects of a rather similar legislation of the European Community (EC) which was already passed in 1982. The so called Seveso Directive made risk communication imperative for all member states of the EC.

The following paragraphs will describe the major provisions of the Seveso Directive, report on the implementation of and experiences with the Seveso Directive in the EC member states, analyze the relationships between regulatory style and risk communication, and summarize the findings in forms of recommendations for future activities of risk communication in the US.

The Seveso Directive

The Seveso Directive was a response to two major chemical accidents in the European Community. First, in June 1974, an explosion in a chemical factory at Flixborough (United Kingdom) killed 28 workers and injured 36 (Otway 1988). More than 50 persons were recorded as casualties among the residents. Hundreds of injuries were reported. An investigation into the causes of the accidents revealed that the company had stored 43 times the amount of flammable fluids licensed by local authorities and that the major agent involved in the accident, cyclohexane, was not amongst them at all. The residents of the plant were absolutely ignorant about the potential danger and were not aware of any emergency plan or protective actions.

The second incident became something like a brand name for chemical disaster in general. The accident occurred on 10 July 1976, at ICNESA, a chemical plant for the manufacture of Trichlorophenol, in Seveso, Italy. Due to an explosive exothermic runaway reaction, highly toxic 2,3,7,8-tetrachlorodibenzo-p-dioxin was formed and released into the air (Naschi 1987, p. 49). Although none of the workers or the residents was killed as a result of the accident, 220,000 people had to be placed under medical and epidemiological surveillance (Otway 1988). The accident caused 187 cases of chloracne, particularly among children. Higher abortion rates and malformations were reported, but the statistical data proved ambiguous and the significance of the test results was disputed among experts (Pocchiari et al. 1987, pp.74-75). The major disaster,

however, was the lack of communication and the total confusion after the accident. A general evacuation of the high risk zone was not issued until 17 days after the accident. For 13 days, the authorities assured the local population that they had no reason to be concerned. On the 13th day after the accident, the Regional Health Director claimed on TV that everything is under control while at the same day the medical director of the industrial group (Hoffmann-La Roche) declared that the situation is very serious and drastic measures, such as removing the top layer of the earth and destroying houses, were required (Lagadec 1987, p. 5).

Both events resulted in several legislative initiatives concerning chemical safety and risk management. Three Directives were launched by the European Community to cope with future accidents:

- o The EC Directive 82/501 to prevent major accidents which might result from certain industrial activities and to limit their consequences for man and the environment
- o The sixth amendment of the EC Directive 67/548 providing regulations and administrative provisions relating to the classification, packaging, and labeling of dangerous substances (Directive 79/831)
- o The EC Directive on supervision and control of transnational shipment of hazardous waste (Pocchiari et al. 1987, pp. 76-77)

Risk communication was only mentioned in one of the three new initiatives. The Directive 82/501 included a paragraph that granted communities the right to be informed about the hazardous material stored at the plant, the potential dangers and risk associated with them, and the contingency and emergency plans (on-site) in effect for dealing with accidents. The major provisions of the Directive are:

- o Generation and transmission of information as the basis for accident prevention and risk management (Otway 1988)
- o Obligation of each member state to generate the same information and share the information with all other members (Otway 1988)
- o On-site evaluation of safety programs (Baram 1987)
- o Formulation of off-site emergency response programs for industrial accident hazards (Baram 1987, p. 61)

The focus of the Seveso Directive is on risk management and emergency planning. Risk communication is only considered as one of the necessary inputs to perform a better management task, thus reflecting the goal of risk management efficacy, but not a political or moral obligation to share all the vital information with the affected population. The risk communication literature refers to such a narrow understanding of risk communication for communities as

the "need to know" versus the more comprehensive notion of "right to know" (Baram 1984; Elkins 1987). The confinement of information to aspects of emergency planning and protective behavior is clearly emphasized in Article 8 of the Seveso Directive which constitutes the "need to know" approach.

1. Member States shall ensure that persons liable to be affected by a major accident originating in a notified industrial activity within the meaning of Article 5 are informed in an appropriate manner of the safety measures and of the correct behaviour to adopt in the event of an accident.
2. The Member States concerned shall at the same time make available to the other Member States concerned, as a basis for all necessary consultation within their framework of their bilateral relations, the same information as that which is disseminated to their own nationals

Article 8.1 is the only provision that regulates information to the public. Although the inclusion of Article 8 into the Directive was highly debated among member states and stakeholder groups, the Commission and the respective ministers of each member country approved of it, particularly since the European Parliament and the Economic and Social Committee (EOSOC), an advisory board to the Commission, endorsed the inclusion.

The other articles of the Seveso Directive relating to risk communication are summarized in Table 1. The summary reveals the principle philosophy of the Seveso Directive. The major goal is to assure that vital information for managing chemical disasters is available to the off-site emergency management agencies and that each member country can learn from the experiences of the other member countries.

After the promulgation of the Seveso Directive, the member states were obliged to initiate national laws and regulation to implement and control the Seveso Directive. In which way and with what results this has been done will be described in the next paragraph. As a routine procedure, the Commission agreed to review the implementation process every four years and to pass additional legislation if the process and the results of the enactment and implementation seemed to be unsatisfactory.

TABLE 1: Summary of Relevant Articles for Risk Communication
(Source: Otway 1988)

Articles	Description
Article 5:	Manufacturer is required to notify the competent authorities of the dangerous substances (quantities, properties, location, exposed workers, employed processes, hazard sources, safety provisions, on-site emergency plans, and information for off-site emergency plans).
Article 7:	Manufacturer has to be informed about state authority measures for off-site emergency planning.
Article 8:	Affected population has to be informed of the safety measures and protective actions in the event of an accident. Information has to be made available to all member states.
Article 10	The manufacturer is obliged to report to the competent authority any accident which occurs, alleviation of effects, prevention of reoccurrence, contingency plans, and post-accidental management.
Article 11:	The manufacturer and the local authorities have the duty to inform the commission about all incidences and experiences made during an emergency.
Article 12:	The EC Commission will keep a European register of all incidences and management interventions.
Article 13:	Publication of data should be limited to avoid competitive disadvantages (confidentiality clause); no information be given to third parties.
Article 18:	National authorities agree to exchange information on the experience of accident prevention and consequence limitations.
Article 20:	All national subsequent regulation has to be reported to the EC Commission.

The first review took place in January 1986. Major changes were not initiated, only thresholds for some substances from the list of hazardous materials were lowered and new substances were added to the list. The provisions concerning risk communication were not altered (Otway 1988).

This changed dramatically after the disaster of a major chemical spill into the Rhine River on November 1, 1986. Again, local authorities were not fully aware of the dangerous substances stored at the facility in Basel and the public was outraged about the lack of prior information about the potential risks to which they were exposed. In March 1988, The EC Commission adopted a second amendment to the Seveso Directive which included the storage of hazardous substances, not just the production of these substances, as part of the facilities to which the Directive applied. Furthermore the Commission revised Article 8.1 completely and adopted a new philosophy reflecting a shift from a passive "need to know" to an active "information transfer" concept. It still does not include the right of the public to be fully informed about the risks of the industrial activities or to take part in the regulation or control of the hazardous substances. But it marks a major step in demanding that information be communicated to the concerned parties on an active basis through public information media such as leaflets or information boards. According to the new amendment, placing the information at City Halls or in Libraries should not be regarded as sufficient for meeting the standards of Article 8. Rather the authorities ought to make sure that every household receives the information in an understandable and comprehensive form. The kind of information to be distributed to the public was specified in Annex VIII of the second amendment. Table 2 lists the major provisions of this Annex.

Although this list is fairly comprehensive, the major thrust of the provision is still on communication about emergency situations and behavioral responses recommended for such an event. But the requirement to identify the hazardous substances and explain their effect on human health is already the first step to the "right to know" policy which is inspired by the political and moral obligation to give citizens the background information to make personal (such as moving away) or political choices (such as voting or being active in community affairs).

TABLE 2: Specifications of Information To Be Provided to the Affected Population (Second Amendment from March 1988)
(Source: Baram 1987, p. 66)

L i s t o f P r o v i s i o n s
1. Name of company and address of site
2. Identification, by name and position, of person giving the information
3. 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
4. An explanation in simple terms of the activity undertaken on the site
5. 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
6. Details on how the population concerned will be warned in case of accident
7. General advice on the actions and behaviour members of the public should take on hearing the warning system
8. 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
9. 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
10. Details of where further information can be obtained
11. Items of Information to be Transmitted to the Public in Application of Article 8.1 to promote uniform Threshold requirements in all nations

The new amendment was not approved of by all interested parties. Industrial spokespersons were concerned that the information given

would scare people more than help them to respond rationally in an emergency (Otway 1988; Wynne 1988). Furthermore, they claimed that the list of information compiled in Annex VIII could only be indicative, but not mandatory since each facility would require specific types of information for emergency preparedness. A case by case procedure was hence recommended. The amendment is too new to have yielded any effect on the member states yet, but it will be interesting to follow the implementation process in the different countries of the Community.

Implementation of the Directive in the Member States

Before dealing with the implementation of the Seveso Directive in each member state, a short review of the legal status of EC Directives may be helpful to understand the procedures and legal obligations related to the law making process in the European Community. Directives from the EC usually undergo the following procedure:

- o Preparation by the relevant Directorate-Generale of the European Commission, which is the EC's equivalent to a national civil service, or executive branch (Wynne 1988)
- o Proposal of a Directive by the Commission (Executive Branch)
- o Advice from the European Parliament (The European Parliament has no legislative power, it can only recommend new legislation for adoption in each member state).
- o Advice from Advisory Committees, representing major stakeholder groups in society such as unions, industry, chambers of commerce, science, etc. For the Seveso Directive recommendations were formulated by the Economic and Social Committee (EOSOC)
- o Enactment by decision of the Council of Ministers of each member state (Depending on the national legislation, ministers have to seek approval by their national parliaments before making binding commitments)
- o General implementation by Commission (Specifications of regulation)
- o Transposition of EC Directive into national laws in conformance with cultural traditions, institutional structures, and regulatory styles (Otway 1988)
- o Enforcement by member states
- o Formal reports to the European Parliament and the Commission about the progress made and the completed stages of implementation in each country.

The procedure of promulgating, enforcing, and implementing EC Directives is complex and time-consuming. Although EC Directives, once they are approved by the Council of Ministers, are binding for each member state, the national parliaments or executive branches have enough discretionary power to translate the Directive into national regulation in accordance with cultural, political, regulatory, and social requirements. With the exception of the Netherlands, where EC Directives are automatically adopted into the national body of laws, all other member states go through a stage of specifying the Directive for national use, adapting the original version to the national regulatory style and change the implementation rules according to the existing political structure (Wynne 1988).

The necessity of integrating European laws into the logical and structural framework of national laws prolongs the implementation process considerably and frequently dilutes the original intentions of the Directive. To counteract fragmentation and misinterpretation of the Directives, the competent authorities are required to meet quarterly to exchange information and re-adapt the national performance to the intentions of the original European initiative.

This coordination function is usually assigned to the regional implementation authorities in order to assure that the interventions and regulations are comparable and similar in each member state. Coordinating local measures have proven rather effective in accomplishing integration of European rules in the different member states in spite of diverging national adaptations of the EC Directives.

Based on this legal framework and complex procedure, it is quite remarkable that with the exception of Italy all member states have passed national regulation in accordance with the Seveso Directive (Wynne 1988). But with respect to risk communication and the application of Article 8.1, the national adaptations reflect a cautious or even hostile approach. In West-Germany and the Netherlands public authorities felt that the existing legislation providing public access to information in the licensing procedure and displaying emergency plans in public buildings was sufficient to meet the requirements of Article 8.1. In France public authorities were confident that they had provided their communities already with all the necessary information and concentrated therefore on the other requirements of the Seveso Directive. Ireland promised to abide to the Seveso Directive in all points at the end of 1987, but so far communication plans for the public are still missing. The only exception is the United Kingdom: After an initial debate between industry and public authorities, a major risk communication campaign was launched and information that exceeded the limited purpose of providing guidelines for emergencies was conveyed to the communities via brochures, leaflets, and public speeches.

The more than hesitant adoption of Article 8.1 in the member states is difficult to understand for an US audience. The habituation to

natural disasters and their management (on average, one evacuation takes place in the US every day), the political culture of free information exchange (Freedom of Information Act), and the role of civil service as an information broker (and not like in most European countries as a benevolent guardian of the common good) resulted in a public attitude that almost takes it for granted that information about emergencies are readily available and submitted to public scrutiny (Baumann and Renn 1988). Although the "right to know" is also highly debated in the US, the "need to know" is almost unanimously approved of by all affected parties in the US.

The European situation is different: With a lack of natural disasters and a stronger paternalistic role of the civil service, most residents near hazardous facilities have neither experienced nor anticipated any major emergency. Although trust and confidence in the civil service have eroded over time, most people still believe that the administration of regional authorities will take good care of them should something go wrong at a facility. In none of the EC countries exists an equivalent of the Freedom of Information Act (Baram 1987). The major way of conflict resolution through informed consent of social elites, as exercised by most European nations, prohibit the disclosure of the informal communication processes among the members of the elite circles. Giving sensitive information to the public is unprecedented and against the established traditions in most European political cultures.

Therefore information transfer is restricted to the legal requirements during licensing. Some nations, such as the Netherlands, provide extensive information during the licensing procedure and encourage public participation. Other such as France have developed a system of incentives and community benefits for the local population around hazardous facilities, but do not share information with the public beyond the typical public relations approach. An active information sharing with the affected population and an active involvement of the public in emergency planning are both major innovations in the relationships between plant operators, public authorities, and affected citizens.

Beyond the novelty of risk communication for most member states, there were other important reasons for the delay or even rejection of Article 8, even in its milder original form. First, a "need to know" presumes the existence of contingency and emergency plans that are to be communicated to the public. But in many countries such plans did not exist, were only rudimentary, or in development. Therefore, the first priority was to analyze the hazards present at a plant, to identify major potential accident scenarios, to develop on-site emergency plans and then off-site plans, and to articulate potentially effective protective actions (Wynne 1988). Since such planning actions are time-consuming, public information had to be postponed until the necessary information would be generated. A good example for this situation is France where the risk communication program is scheduled to be launched in 1989 (Wynne 1988).

Second, nations such as West-Germany, the Netherlands, Luxembourg, and Denmark, have already established public information and involvement programs in their licensing procedure. The possibility of citizens to intervene in the planning process and to demand access to the documents resulted in delays and fierce conflicts between public authorities as regulating agency and citizens' groups (Renn 1985). Tired of dealing with public opposition and concerned about delays of new industrial projects, most regulatory agencies were not inclined to go any further than what they already had to face and rejected any extension of the existing information requirements.

Third, the duty to inform the public was clearly defined in the Directive as an obligation of the local authorities, and not the industry. The flow of information was visualized as a two-stage-process: Industry should provide the authorities with all the necessary information enabling them to design effective emergency plans. At this stage, confidentiality is assured and industry is not allowed to withhold information for proprietary reasons. The official authorities then convey parts of the received information to the public focussing on the emergency provisions and protective actions. By law they are obliged to keep all proprietary information secret. Although this information model assures a good working relationship between industry and the authorities and may indeed assist in constructing the most effective emergency response, it may easily convey an image of conspiracy between industry and regulators in public perception. This image often becomes a self-fulfilling prophecy forging a tie between the plant operator and the emergency managers who both feel pressed to defend themselves against public claims.

Fourth, there were problems of clarification which prevented a smooth and timely implementation of the Directive. It was not defined what constituted a major accident, how large the zone for emergency planning and risk communication should be, how to deal with expert dissent about hazardous material and its effects, and in which form information had to be provided (Wynne 1988). Giving much discretion to each member state was intended to make the adoption process easier, but resulted in lengthy debates in each country, and often at each site, about the conditions and the framework for implementing risk communication programs.

In essence, in spite of its early promulgation in 1982, most European countries did not establish a risk communication program which exceeded the limits of what had been done under various national provisions in the past. Brian Wynne, who published the first evaluation of the Seveso Directive for the European Community, concludes: "The great majority of industrial accident hazard sites in the EC - an estimated 1500 or so - do not benefit from the public information processes required under Article 8" (Wynne 1988).

The only exception is the United Kingdom. Apparently industry and public authorities ventured together to launch information programs at many industrial sites. The experiences with this program are described in the next paragraph together with some empirical data about public and industry's perception of the Directive.

Empirical Data on Risk Communication Efforts

The original responses to Article 8 were not much different in the United Kingdom compared to all other European nations. Several spokesperson for industry warned public authorities, in particular the Health and Safety Inspectorate, to disclose too much information since it would generate unnecessary fears and worries among the population. But in intensive negotiations between industry and the authorities, a joint information campaign was agreed on and almost immediately implemented. In contrast to France, for example, information was provided even at those sites where emergency plans were incomplete or outdated. The information given covered all the items that were part of the existing plans or results of risk assessments and extended the communication program to cover the envisioned activities underway to change the situation.

In more than 70percent of all designated sites communication programs have been initiated. The results so far disprove all the fears or claims of public overreaction or increased opposition. In none of the sites public outrage or "unreasonable" opposition were recorded. Brian Wynne states that the notion of zero risk was not shared by most of the communities and that the information was digested by the communities either with favor or with apathy, but hardly ever with hostility or outrage (Wynne 1988).

A survey in the Manchester area, one of the first sites experiencing the information program, revealed that 40percent of those questioned felt concerned about the hazard, but did not indicate any major disapproval with the risk management performance of the local authorities. The risk to which they were exposed were not regarded as a serious threat although many had difficulties to express the degree of danger the facility would pose to them. Asked to indicate the importance of the threat, they ranked it as less important than for example unemployment. The issue was not central for them. Accordingly, most of the ones questioned had not studied the emergency guidelines and were basically unaware of the protective actions they were supposed to take in the case of an accident (Wynne 1980).

Thus, the lessons to learn from the experiences in the United Kingdom are that information about hazardous facilities and emergency planning is likely to elicit calm responses and may even result in underreactions and downplaying of the potential danger. Many respondents felt that it was not worthwhile to studying protective actions for emergencies. Furthermore, trust and

credibility of the information source were enhanced more than compromised even at those sites where existing plans were deficient and in urgent need of improvement. The notification that the present situation would be improved and that the necessary changes were underway helped to convey the message to the public that public authorities were eager to improve public protection and that they did not try to keep the existing deficiencies secret to the public.

It should be remembered that the information given covered only the risk related data about the hazard and its health effects and emergency responses. In some areas, public officials cooperated with industry to disclose more information and to give a detailed analysis of the production and safety features of the plant. A formal involvement of citizens in emergency planning and community control of safety requirements, however, was neither envisioned nor implemented.

The traditional European way of displaying information in public places was the topic of a Dutch study about the effects of the Seveso Directive (Van Eijndhoven and Worrel 1987). Although information about hazard prevention, accidental management, and mitigation of accident consequences was available in principle, interested citizens had to know in advance where to find this information and how to decipher the technical language used therein. Nevertheless, most citizens trusted the watchdog role of the civil service and showed no overt interest in gaining more information. But they were more than eager to blame public authorities for any malfunction when they had experienced an accidental release of hazardous material.

The lack of public interest has been one of the most pervasive arguments of industrial groups in Europe to prevent or modify the implementation of Article 8 in Europe. According to their view the public has the desire to trust the emergency managers and does not want to be bothered by frightening disclosures. Therefore, communication between authorities and industry would be vital for reinforcing the confidence in the management capacity of the authorities, but communication to the public would be detrimental because it would create distrust in industry's performance, construct an artificial gap between industry and regulators, and poison their cooperation. In addition, industry envisioned the following problems as a result of public information (Baram 1987, pp. 22-23; Wynne 1988):

- o disclosure of valuable proprietary or trade secrets
- o negative impact on competitive position
- o infringement on the autonomy of corporate managers and their obligation to protect firm assets and shareholder interests
- o imposition of new costs and burdens
- o amplification of public anxieties and controversies

- o intervention by agencies in the process and thus diffusion of responsibility for safety and therefore a diffusion of accountability
- o detrimental effect on public image of corporations

Industry's viewpoint clashed with the perception of environmental groups. From their point of view, the information conveyed was not more than an attempt to manage emergencies more efficiently and diffuse responsibility from the originator or regulator of the hazard to the victims. Giving protective action guidelines was considered a sublime way of familiarizing the public with the notion of major catastrophes and blaming the victims for not taking the prescribed protective actions in the case of an emergency. Although most environmental groups agreed that emergency plans should be made public, they view this disclosure as a first step to make the public more aware of the risks and as an incentive to demand stricter regulation. Thus they feel discomfited with the "need to know" concept, but insist on full disclosure of all information and public involvement in risk management.

It is interesting to note that the two adversarial groups, industry and environmentalists, agree in one point: Giving information as a means to share responsibility for emergency management (and consequently management failures) and thus diluting moral or legal liability is rejected by both parties. Within a paternalistic concept of civil service, liability and responsibility are the major agents of quality control. If this premise of quality control is lacking or unclear, management failures are likely to occur and may lead to overlapping competencies, beaurocratization of planning processes, indifference towards human sufferings, and other undesirable results. The solutions suggested by the two groups to avoid this situation are fundamentally opposed. Whereas industry wants to rely on the traditional model of close cooperation with the official authorities acting on the mandate to manage the respective hazards and plan for emergencies, but restricting public information to the creation of trust and credibility, environmental groups strike for a more US inspired adversarial model with full disclosure of all relevant information and public involvement in risk management.

Thus environmental groups, consumer groups, and labour groups have filled in the vacuum where official communication was not available or deliberately withhold (Wynne 1988). Given this controversy and the confusion about the major incidences that have shocked the European population in the last decade (from Seveso to Bhopal, from Chernobyl to the Rhine disaster), I would hypothesize that in the long run the system of "blind" trust in the civil service is unlikely to survive. Although public opinion data still shows considerable trust in official emergency management authorities (cf. above mentioned studies; for Chernobyl see Renn 1988), a clear trend towards more openness and public participation appears in almost all European countries. Such a trend is almost impossible to reverse.

Risk Communication and Regulatory Style

By contrasting the European style of regulation with the US experience, the oversimplified impression might have been left that all European nations follow the same regulatory structure. But the national styles within the European Community vary as widely as between Europe and the US. So it is not by mere chance that the United Kingdom has been the forerunner in the implementation of Article 8 and that Italy has not even passed the required national adoption of the 1982 Directive. In the literature about regulatory styles (O'Riordan 1985; O'Riordan and Wynne 1987; Baumann and Renn 1988) usually four or five different clusters are listed:

- o **Adversarial Approach:** This approach is characterized by large executive agencies, by precise procedural standards and detailed rules, by high levels of openness to documentation and public scrutiny, and the need for scientific justification of resulting decisions. This approach is typical for the United States (O'Riordan and Wynne 1987, pp. 398-400).
- o **Consensual Approach:** This approach is based on a high level of trust between institutional actors, behind closed door negotiations, discretionary power of regulating agencies, and reliance on judgment rather than evidence (O'Riordan and Wynne 1987, p. 400; Bauman and Renn 1988). A typical example for this approach is the United Kingdom.
- o **Authoritative Approach:** This approach relies on strong executive power of setting standards and enforce compliance, involves conflicts among different governmental agencies rather than between government and social groups, and assigns clear responsibilities to governmental actors (O'Riordan and Wynne 1987, p. 402).
- o **(Neo)-Corporatist Approach:** This approach is characterized by a collegiate form of decision making whereby established social groups negotiate regulatory actions with the official authorities and define the range of responses that are labeled acceptable for conflict resolution (O'Riordan and Wynne 1987, p. 403). This approach is manifested in West-Germany and in some of the Scandinavian countries.
- o **Beaurocratic Approach:** This approach is characterized by a collective form of decision making, overlapping responsibilities, dominance of complex procedural rules, and inner-organizational conflicts. In contrast to the authoritative approach, the structure of command is less defined, and different hierarchical systems compete with each other (Bauman and Renn 1988). This approach may be typical for Italy.

TABLE 3: Regulatory Styles and Their Impact on Risk Communication

Categories	West-Germany	France	United Kingdom	Italy	USA
Regulatory Style	Corporatist	Authoritative	Consensual	Beaurocratic	Adversarial
Level of Main Responsibility	Major Interest Groups	Federal Government	Commissions Agencies	Compe-ting Beau-rocra-cies	Agencies Courts
Role of Formal Analysis					
a) Justification	Medium	Low	Medium	Low	High
b) Liti-tation	Medium	Low	Low	Medium	High
Freedom of Infor-mation	No but leak-ages	No	Low	No but leak-ages	Yes
Role of Civil Service	Lega-licistic	Paterna-licistic	Guard of Common Good	Gate-keeper	Broker
Function of Commu-nication	Efficacy (Trust)	Effi-ciency (Trust)	Trust (Effi-cacy)	Power Trust	Regu-lation (Trust)

Table 3 illustrates the consequences of the different regulatory styles for the adoption and acceptance of risk communication. Risk communication serves different functions within each regulatory style. In corporatist structure, information serves the prime function of informing the public about the decisions that have been negotiated and of optimizing behavioral responses in emergency situations. A minor goal is to enhance trust and credibility. Public involvement is only functional as far as it provides valuable feed back or suggestions for the involved parties to bargain for more influence and use public support as vehicle to exercise pressure. On the basis of this background, it seems understandable that the corporatist countries felt no additional need for public information

since the existing systems assured already the basic communication needs for efficacy and to a lesser degree trust. The latter may become more important if the trend towards adversarial style becomes more prevalent.

The authoritative system is also interested in conveying trust, but is not reliant on trust for performing and sustaining its basic functions. The paternalistic attitude of the civil service makes information mandatory as a means to make emergency management efficient and smooth, but further efforts to communicate are not necessary, unless public pressure becomes too strong. Authoritative systems are usually fast in responding to information needs, but are very selective in what they provide to the public. The delay of risk communication in France was not caused by the unwillingness to give information, but by the specific circumstances. Appropriate information was not yet generated and selected for publication. On their own initiative, many mayors in communities with hazardous facilities in France distributed booklets or brochures on emergency management. The emphasis was on the message that the public authorities were in control of the hazards and well prepared for an emergency (Wynne 1988).

The bureaucratic system usually needs the most time and involves a muddling through approach. It is typical for this system that key actors serve some of the bureaucratic functions on their own account without formal legitimation or official approval (which often leads to litigation). Communication is focused on creating favorable images about the bureaucracies or actors involved. This function contrasts sharply with the intention of the Seveso Directive to provide sensitive information about the hazardous situation and make the population knowledgeable about the appropriate protective actions. Due to the diffusion of responsibility, bureaucratic systems are often disinterested in the efficiency of their decisions as long as they perpetuate their claim to be needed for handling the issue in question. Clearly, implementing the Seveso Directive in such a regulatory system would create the most severe resistance, basically in form of delaying the process as long as possible. This is exactly what happened and is still happening in Italy.

The consensual approach is based on the acceptance of informed judgment as a major yardstick for decision making. Acceptance is dependent on trust and credibility of the information sources. Evidence and counter-evidence, litigation, and formal procedures are less important for the implementation of regulatory actions. Rather proving good judgment, relying on highly reputable experts (such as Royal Commissions), and showing good will are major elements for regulatory successes and public acceptance in a consensual system. Since trust and competence are essential goals of communication in such a system, the information provisions of the Seveso Directive were not in opposition to these goals. After an initial hesitation industry and public service in the United Kingdom were convinced that they could "sell" the products of the existing regulation and document their good judgment or at least good will. Brian Wynne

commented this process as a metamorphosis from fear to pride (Wynne 1988). The responses by the public reinforced the notion of creating trust and confidence through the means of risk communication as mentioned earlier. Thus for the consensual system, the Directive did not contain any destabilizing elements, but included many constructive challenges which helped to consolidate the underlying rationale of the consensual system.

All European approaches have in common that risk communication is not regarded as a supplement or a substitute for risk regulation (Baram 1987). Thus the notion of a "right to know" as a prerequisite for citizens' participation in decision making and co-determination of the outcome of this involvement is alien to the European styles of regulation. Rather the focus is on improving risk management and creating trust. Public involvement has entered the licensing of new facilities, but for operation control, monitoring, and hazard management public participation is not envisioned. The US, on the other side, has developed a system of public involvement which mandates the input from different public groups in the decision making process. If this input is ignored or not adequately addressed, litigation is likely to be the consequence. Thus, within the adversarial system, the concept of "need to know" does not make much sense since trust and credibility as well as legal acceptability are all linked to the overall rationale of involving and functionally integrating different adversarial viewpoints in the decision process.

The recent trends towards more adversarial elements in European countries have already left marks on the pending European legislation. Was the second amendment of the Seveso Directive still inspired by the "need to know" concept, however active in nature, so includes the new Environmental Assessment Directive, which is to be enacted in 1988, the provision that all environmentally harmful projects need public information programs and that the public concerned be given an opportunity to express an opinion before the project is initiated, with written submissions and public enquiry given as examples (Otway 1988). Similar requirements were expressed at the recent OECD Ministerial Conference on Accidents Involving Hazardous Substances (February 1988) specifying the following function of risk communication:

- o information about hazard;
- o information about appropriate behavior;
- o public involvement in decision making

It is still premature to postulate a convergence of national regulatory styles towards an adversarial mega-concept. All the pending legislation, even if it appears to fit the adversarial description, has to be adopted by each member state. As documented for the Seveso Directive, the implementation of the risk communication requirement was modified in accordance with the prevailing regulatory style in the respective country. The resulting legislation was more a product of the regulatory system and its

functions than an attempt to meet the intentions of the European legislation. Nevertheless the evolution of legislation that is intended to grant citizens more rights to become involved in emergency planning and hazard management, and the slowly growing erosion of public trust in traditional institutions of risk management amplified by the recent disasters in Chernobyl and Basel (spill of chemicals into the Rhine) are signals for a change towards a more adversarial style in European risk regulation. It will be interesting to observe how these adversarial elements will coexist with the traditional forms and what kind of regulatory innovations will emerge in order to reconcile the often contradicte elements of the different systems. Table 4 provides an illustration of the legislative evolution towards more citizens involvement.

TABLE 4: Evolution of European Legislation towards more Citizen Involvement and Adversarial Elements

Categories	Seveso	Amendment 86	Env. Assess- ment Dir.	OECD Reccom.
Need to Know	x	x	x	x
Active Infor- mation	[x]	x		x
Right to Know		[x]	x	x
Public Involvement			[x]	x

Conclusions and Recommendations

As a result of the Seveso accident and other chemical disasters, the European Community promulgated the Seveso Directive which is aimed at the improvement of risk management and emergency planning. As Baram has pointed out, this overall objective has partially been met in the interim period between the enactment and the implementation of the Directive. Among the accomplishments that he refers to are (Baram 1987, pp. 80-81):

- o corporate staffing and allocation of resources
- o change of management structures
- o change in engineered safety functions
- o training and education of workers
- o process improvements
- o research to identify vulnerabilities
- o planning for contingencies
- o relations with community
- o assistance to downstream customers
- o overall, more assertive and coherent safety management

This paper did not focus on these improvements of risk management, but dealt with the specific requirements for risk communication to the public. The Directive included the obligation to inform the affected population about the hazardous material and its properties, accident prevention measures, and emergency planning. In spite of the fact that the Directive was only postulating a "need to know" rather than a "right to know", our analysis showed that with the exception of the United Kingdom all member states of the Community were either reluctant in the adoption of this requirement or felt that the existing laws were already covering the intent of the Directive.

The major reason for the different treatment of the communication requirement was found to be the national regulatory style which varies considerably among the member states. The consensual approach exercised by the United Kingdom appeared well suited for the "need to know" requirement because it assists in conveying trust and confidence in the regulatory bodies. Also, the authoritative approach, most typical for France, was in accordance with the "need to know" philosophy. Communication relied here, however, on the availability of complete and reliable emergency plans which had to be developed first before they could possibly be communicated to the public. The corporatist approach, most typical for West-Germany, is already based on partial information to the public as a means to increase efficacy and to create trust for the informed consent of the major stakeholder groups. An extension and intensification of such a communication program was, however, regarded as a threat to the civil service because it might destroy the cooperation between regulators and industry and challenge the painfully derived compromises between the major, often counteracting parties involved in the negotiations. The least adaptive system was the bureaucratic approach, typical for Italy, in which information always challenges the legitimation of existing agencies and authorities. So it was not surprising that risk communication attempts were widely blocked there.

All European approaches are characterized by a clear distinction between risk regulation and risk communication. The dialogue between industry and regulators serves as the major information processing station for designing risk regulation, the dialogue with the public is meant to convey these regulations to the affected population, basically for two reasons: establishing confidence in the risk management capacity of the authorities and familiarizing the public

with protective actions for emergencies. The US approach, in contrast, is geared towards using communication between and among all three involved actors (industry, regulators, and the affected public) as a major mechanism to generate regulation or even substitute formal regulatory provisions. M. Baram concludes in his analysis: The European nations fail to empower the public but guarantee company safety analyses 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.

Given the dependence of risk communication from the prevailing regulatory style, is there anything to learn from the European experience for the US? In spite of the problem of transferability of regulatory elements from one context to the other, some insights can be gained from the study of the European countries:

- o Cooperation between industry and regulator has proven beneficial for both parties. Regulators gain a better idea of the plant specifics and may use industry's resources for off-site emergency management while industry can profit from the relationship in terms of gaining trust and reputation. Although confidentiality of contacts and information are legally restricted in the US and are also counterproductive for gaining public trust, regular consultations and cooperations are vital elements to improve the emergency management capability of communities.
- o Independent of the national style, citizens in all countries are more aware of the hazards in their neighborhood and demand more information and involvement. The degree of this demand may vary from country to country, but there seems to be an international consensus for more and accurate information. Although the US is a forerunner in this respect, hunger for information and participation is far from being stilled. Early involvement of citizens and incorporation of their concerns into risk management are both incentives for avoiding costly litigation and incorporating public concerns into the emergency plans.
- o The few empirical studies on the effects of information demonstrate that the popular notion of an overreacting public that demands zero risk and absolute safety is a myth. On the contrary, public responses were rather moderate and calm. In some instances, even the list with protective actions was ignored. Getting the attention of the public for these questions seems to be the far more serious problem than avoiding unnecessary fear and outrage.
- o Transnational cooperation and information are almost self-evident elements of the European approach to risk management. Learning from the mistakes of others, coordinating joint management efforts, and keeping an European register for

all incidences provide the basic elements for an evolution of knowledge that helps to improve emergency management and to cope with the catastrophic potential of many facilities. In this respect, the US is far behind the European nations. The belief in decentralization and organizational fragmentation (evident in the parallel emergency planning of police, medical services, emergency management agencies, and recently chemical disaster management in accordance with SARA III) impedes the information flow between hazard management agencies and prevents a more coherent and coordinated system of emergency planning. Centralization may not be the right answer, but integration of different services and construction of a commonly accessible body of knowledge are needed improvements for the US system. SARA III seems to provide such a network for information transfer.

The Seveso directive was a first and courageous step for most European nations to meet the political and moral mandate for public information. Not all member states are yet ready for a full implementation of the Directive, but the development to a more open and adversarial style seems irresistible. Having pushed public involvement much further than the European nations, the US is now in the phase of enhancing this element of communication and granting citizens a "right to know". The major lesson one can learn so far from the European experiment is that the public is more mature and rational to use those rights than many sceptics have predicted. The outlook for the US justifies cautious optimism for the following phase of implementing the "right to know" clause of SARA III as a major guideline for risk communication on the community level.

Literature

1. M. Baram, Corporate Risk Management. Industrial Responsibility for Risk Communication in the European Community and the United States Report to the Commission of the European Communities Joint Research Center Ispra., No. 288285-12-ED ISP USA. University of Boston, Boston, MA, October 1987
2. M. Baram, "The Right to Know and the Duty to Disclose Hazard Information," American Journal of Public Health, 74, (4): 385-390 (1984).
3. E. Bauman and G. Renn, Air Quality Standards and Regulatory Styles in West Germany and the United States. Project Report Submitted to the German Marshall Funds and the Nuclear Research Center Jülich. Yankee Electric Power, Washington D.C. and Clark University, Worcester, MA, February 1988

4. U. Beck, Risikogesellschaft: Auf dem Weg in eine andere Moderne, Suhrkamp, Frankfurt, West-Germany 1986
5. C.L. Elkins, "Risk Communication: Getting Ready for 'Right-to-Know'," EPA Journal, 13, (9): 23-26 (November 1987).
6. R.L. Keeney and D. von Winterfeldt, "Improving Risk Communication," Risk Analysis, 6, (4): 417-424 (1986)
7. P. Lagadec, "From Seveso to Mexico and Bhopal: Learning to Cope with Crises," in: P.R. Kleindorfer and H.C. Kunreuther (eds), Insuring and Managing Hazardous Risks: From Seveso to Bhopal and Beyond, Springer, Berlin, FRG, et al. 1987, pp. 13-46
8. D. Naschi, "Engineering Aspects of Severe Accidents, with Reference to the Sveso, Mexico City, and Bhopal Cases," in: P.R. Kleindorfer and H.C. Kunreuther (eds), Insuring and Managing Hazardous Risks: From Seveso to Bhopal and Beyond, Springer, Berlin, FRG, et al. 1987, pp. 47-59
9. T. O'Riordan, "Approaches to Regulation," in: H. Otway and M. Peltu (eds), Regulating Industrial Risks Butterworth, London, UK, 1985, pp. 20-39
10. T. O'Riordan and B. Wynne, "Regulating Environmental Risks: A Comparative Perspective," in: P.R. Kleindorfer and H.C. Kunreuther (eds), Insuring and Managing Hazardous Risks: From Seveso to Bhopal and Beyond, Springer, Berlin, FRG, et al. 1987, pp. 389-410
11. H. Otway, "Risk Communication and Policy in the European Communities: Background, Status, and Trends," Paper presented at the Conference: Responsibilities for Multinational Corporations to Disclose and Communicate Risk Information, Boston University, March 24-25, 1988.
12. F. Pocchiari; V. Silvano and G. Zappono, "The Seveso Accident and Its Aftermath," in: P.R. Kleindorfer and H.C. Kunreuther (eds), Insuring and Managing Hazardous Risks: From Seveso to Bhopal and Beyond, Springer, Berlin, FRG, et al. 1987, pp. 60-78
13. U. Renn, "Risk Analysis - Prospects and Limitations," in: H. Otway and M. Peltu (eds), Regulating Industrial Risks Butterworth, London, UK, 1985, pp. 111-127

14. O. Kenn, "Public Responses in the Aftermath of Chernobyl," in: Proceedings of the 12th Annual Symposium of the Uranium Institute in London, Butterworth, London, UK, 1988, pp. 124-148
15. J.H. Sorensen and D.S. Mileti, "Risk Communication for Emergencies," in: R. Kasperson and P.J. Stallen (eds), Risk Communication Reidel, Amsterdam, NL, and New York, NY, in press
16. J. van Eijndhoven and C. Worrell, Information Practices and the Seveso Directive: Situation and Developments in the Netherlands, Manuscript, Utrecht University, Utrecht, NL, April 10, 1987
17. B. Wynne, "Risk Communication for Chemical Plant Hazards in the European Community 'Seveso' Directive," Paper presented at the Conference: Responsibilities for Multinational Corporations to Disclose and Communicate Risk Information, Boston University, Boston, MA, March 24-25, 1988.