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Environmental Risk Management: The Experience of a European Insurer

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1. Introduction

Reporting about experience – as the title indicates – has always been a special domain of insurers. The question arises, however, whether we should not share this experience with managers of various industries in the controversial field of environmental risk management. Certainly it would appear to be appropriate to do this, particularly as claims in the fire and liability insurance sectors are increasingly influenced by environmental factors. Sharing our ideas and knowledge in this field will assist in overcoming many of the problems the insurance industry are facing, and indeed, have faced, with the field of environmental risks. Although some of the observations will be unpopular, it is an appreciation of their existence which assists in the comprehensive assessment of the current situation.

To enable greater clarity, this paper is divided into three sections. First, I will discuss the general status of risk management today. Second, I will comment on the difficulties that environmental risk management entails. Finally, attention will be given to the requirements that risk management has to fulfill if we want to enter the EIL-Insurance[1] field.

2. The current status of Risk Management

This can, most efficiently, be described by addressing some areas of major concern:

2.1 Losses and Risks

Risks can be defined as loss potentials; that is, they are the potential for a loss occurring at some time in the future. Low probabilities are favourable but neither do these exclude possible loss occurrences and their, largely unknown, consequences.

On the other hand, losses are the result of incidents or accidents. Moreover, they are generally the result of human failures and can be, as such, located as a management fault. Frequently we, as insurers, hear the excuse that a "technical failure" occurred. This is, however, nothing more than a human error, as all technical installations are in fact man-made.

An important consideration is to realise that risks are not generated by insurance companies, but are produced by those companies requiring insurance.

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[1] EIL: Environment Impairement Liability

Of particular relevence in the process of making accurate predictions for risks, is an analysis of past losses and accidents. However, as losses are failures, many psychological factors – in addition to lost evidence – tend to hinder this work due to allocation of guilt that is inevitably involved. Neither is this a feature which only applies to those investigations taken to court. Clearly loss analysis, though a useful tool, is insufficient for an adequate risk analysis. More has to be done.

A particularly demanding task is the analysis of small scale incidents which could lead to very heavy losses. Catastrophes never appear 'out of the blue' and there are always warning signs if the situation is examined closely. The problems concerning asbestos and dioxin illustrate this well. To acknowledge that small losses may, under certain circumstances, trigger catastrophies is a very difficult task.

A constant problem is that companies tend to take a prescriptive, rather than preventive, attitude towards risk management. This is despite the fact that the latter method is generally considerably cheaper than the former. Table 1 illustrates this very clearly.

Table 1: Cost of prevention

Year	Incident	Compensation	Cost of Prevention*
1976	Exploding Reactor Seveso	US $ 150 Million	< US $ 10,000
1981	Collapse Hyatt Regency Hotel Kansas City	US $ 90 Million	< US $ 1,000
1984	Union Carbide Incident Bhopal	US $ 200 Million	< US $ 50,000
1986	Schweizerhalle Fire	US $ 60 Million	< US $ 100,000

Successful prevention begins with the assumption that a loss could occur, that is, that risks are in evidence, and then the identification of these.

The success of companies who tend to take a long-term perspective in their risk management strategies is generally reflected in their loss experience; evidence that they have handled their risks more professionally.

2.2 Risk Management and the Future

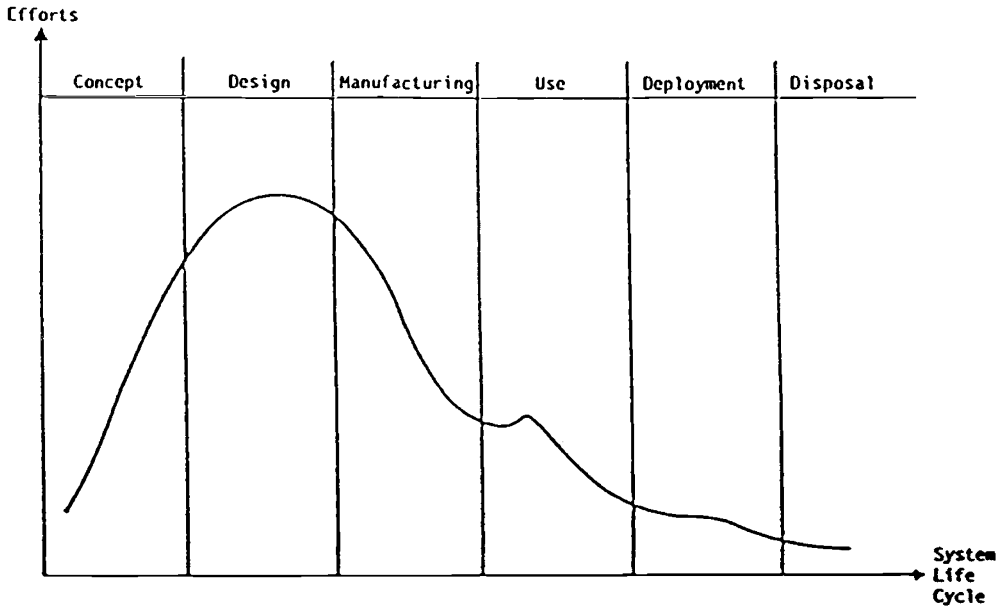
Risk management can only be effectively undertaken by those who control the risks, that is, by the company management itself. No insurer or consultant can take over management responsibilities. As risks refer to future events, "risk management" as a term could be replaced by "managing the future".

"Managing the future" is, without doubt, considerably more difficult than to argue about the past. Analysing the future requires planning at a high degree of abstraction. We have to imagine the use of future products or systems and the negative consequences they may entail. The degree of abstraction required increases from fire risks over product liability to environmental risks. If we want to avoid gambling with our future, we have to approach the situation in a structured manner and articulate it through a suitable methodology of risk analysis. Only then can an adequate level of confidence be attached to our conclusions.

* Estimated

Assuming that successful risk management can equal the description of a professional "managing the future", then it is necessary that we analyse the risks associated with products and systems at an early stage of their development. Indeed, ideally this should be done at the design stage, as illustrated in Figure 1.

Figure 1: Safety Procedures during the Life Cycle of a Product



With respect to those comments made above, it would appear that two fundamental questions need to be answered: does risk management, at present, sufficiently cope with the future and is it, indeed, possible to assess risks during the design phase of a product?

2.3 Risk Management and Acceptable Risks

A basic implication in the term "risk management" is an understanding of what level of risk is, in fact, acceptable, and which risks are not acceptable and therefore need to be managed. As a basic rule, it can be said that the acceptable risk level of the manufacturer should meet the safety levels expected by the user or those exposed to the risk. If a gap should exist between these two expectations, a serious problem will inevitably result. The issue is further aggravated by the fact that judgement on what is acceptable is only taken by the courts who assess the negligence of the parties involved. As such, the acceptable risk can only apply to very specific cases within a retrospective context. It is not valid for the current situation, and much less for the future.

Decisions concerning the levels at which acceptable risks should be set are some of the most difficult facing line management and cannot, as such, be delegated. To circumvent any commitment to be taken, it has been apparent in recent years that many managers have tried to avoid decisions such as these by creating committees who may discuss these problems for years.

The exponential uncertainty associated with handling the future is, therefore, further aggravated by decisions concerning what will be acceptable. Where are the managers who are willing to take such decisions?

2.4 Risk Management and the Risk Manager

It should be clear that only line managers can truly fulfill the functions required of the risk manager, and this at all levels. This excludes those who have the rather misleading title of risk manager, a title that was chosen by insurance buyers many decades ago. An unfortunate result is that many of the line responsibilities of risk management are delegated to a so-called risk manager, which is usually a staff function in larger and medium-sized companies and is concerned, primarily, with the purchasing of insurance.

Decisions concerning risk matters, as I have outlined earlier, are difficult and invariably unpopular; they certainly do not offer a high probability of success. If the correct decisions were always made, losses would never occur. On the other hand, if a loss does occur and was identified in a risk analysis without any remedial measures taken, then enormous difficulties may ensue. This is something that has been frequently observed in the past. These consequences are an ever present fear for any line manager, so much so that many may feel that it is better to neglect risk analysis.

Strong management, with a leadership that is capable of looking at problems at a high degree of abstraction, is an essential requirement for successful risk management. Risk managers (in the context in which they are defined at present), consultants nor insurers can claim to fulfill these functions; it is the line manager who holds the key to this demanding role.

Todays risk managers could still, however, play an important part as advisers to top management on safety technology, risk assessment and loss investigation etc. The thorough analysis of the cause of previous loss is the perfect tool to improve the line manager's risk awareness.

2.5 Risk Management and Risk Reduction

The activities of risk management should lead to preventive measures for those risks that were determined unacceptable. The following sequence exists in this context: eliminate – reduce – transfer – retain. Rarely, however, is elimination achieved unless the life cycle concept is incorporated as a part of the company's risk policy. Emphasis is generally shifted to reduction, although, here too, fail-safe methods of risk control, through engineering methods, are rare due to the high costs involved. Indeed, these costs reflect the absence of a life cycle concept as many hazards addressed in the design phase could be eliminated with no, or little, additional cost. Unfortunately, risk reduction then becomes a matter of the instructions given to operators. However, if measures such as these are applied to high energy potentials or vulnerable elements within a company, it no longer is a reduction measure but simply represents a transfer of the risk to the operator. This is a typical example of weak management in operation; the higher the hazard, the greater the degree of delegation.

Delegation upwards for high risk situations in a strong management environment, on the contrary, would lead to the introduction and development of automatic, fail-safe protection systems. This is the case as good managers want to be sure that business operates smoothly and without any unforeseen problems.

2.6 Summary of the Current Status of Risk Management

An outline of the current status of risk management, and the criteria which are at present used in assessing risk, is not promising with respect to the more demanding task of environmental risk management.

Some of the significant findings are that:

- Risks can only be managed by those who are creating them. Unfortunately, this is seldom the case.
- Next to strong leadership executed by forward-looking managers, it is necessary that, in assessing future risks, these managers are also able to work at a high degree of abstraction.
- The future, as much as possible, should be anticipated along the life cycle of a product; its neglect in the past has meant that systematic approaches are rarely used.
- To manage a risk also means to be able to accept a risk. This does not imply, however, that all risks be accepted and nothing further done, but that the accepted risks meet the users expectations.
- Today's risk managers are unable to manage risk as they don't have the responsibility for the plant operation. Their title demands something more than the purchasing of insurance, including risk analysis, risk assessment and the search for 'state of the art' solutions through advanced technology.
- The reduction of risk is frequently, and sadly, understood as improving procedures for the operation of high hazard processes; that is, transfering the risk to the operator.

Although the current situation is hardly optimistic, it should be remembered that ten years ago it was barely possible to talk about loss at all. The next step is to seriously discuss the implications of risks, commit line management and implement real risk reducing techniques. Although procedural improvements are an important result of this process, they cannot be the only measure taken.

3. Risk Management and the complications created by environmental problems

The conclusions of the preceding section do not allow for many additional difficulties without serious consequences for risk management activities. However, many do exist. Seven of the more important problems will be considered in greater detail.

3.1 Time Lag Between the Cause and Effect of an Incident

Spectacular, sudden and accidental incidents, such as Seveso, Bhopal or Basel, had many visible short-term effects and many long-term effects, the consequences of which we still have to learn.

Unspectacular, gradual releases, and the intake of toxic substances, can lead to latency periods lasting twenty years and more, such as the case with Asbestos and DES.

Risk identification as a prerequisite of risk management is particularly difficult in these circumstances. Not only is an additional ability to work at a high degree of abstraction required, but as the element of certainty decreases in cases such as these, as does the level of confidence.

3.2 The Pathways of Toxic Substances Are Not Always Visible Nor Understood

Gases and vapours are very often colourless and odourless, which makes it difficult to detect leaks or to follow them once they are airborne. A brief look over the rooftops of a city or factory offers a huge variety of potential outlets, so-called vents or stacks, from which substances "officially" leave the plant as airborne pollutants. The leaks at flanges, valves and pumps dissipate "unofficially".

Underground piping for liquids were for many years – and still are on occasion – installed in the same manner as over-ground equipment. An improved corrosion protection was deemed adequate, whereby, until recently, the possibility for inspections didn't exist at all. Once a liquid enters the soil, the prediction of a pathway is next to impossible.

Similarly, substances can undergo dramatic transformations through the impact of energy or bacterias. A well known example of this is the generation of very toxic dibenzofuranes from PCB's if exposed to heat. Other examples are less clear, such as the effect of fluorocarbons on the depletion of the ozone layer.

3.3 Damage Assessment is Difficult

Every living organism or biosystem has a certain resistance capacity, though this will eventually collapse when confronted by numerous synthetic substances (of which many are highly persistent).

It has already been noted that high dosage can be assessed at a fairly high degree of accuracy. This is particularly relevant for sudden releases where the level of concentration is known. However, dependent upon metereological conditions – in the case of gaseous release – the distribution may vary considerably. Another problem is low dosage, long-term pollution exposure. The dose-response curve for these low concentrations is a particularly disputed issue.

Since testing with human beings tends to be very limited, screening has to be done with animals. To transfer these results to the consequences for human life is an extremely difficult process. Similarly, if many substances are involved in a toxic release, which is normally the case with low dosage pollution, it is practically impossible to determine a clear cause-effect relationship.

3.4 The Detection Limits Drop Permanently

Over the past twenty years the detection limits of pollutants, especially heavy metals and Seveso-type toxic chemicals, have dropped continuously, indeed, by a factor of about 10,000. Unfortunately this has not been matched by a corresponding increase in additional knowledge gained in this field. Unfortunately, it would appear that an increasing gap is developing between identification of a substance and knowledge of its adverse effects on

the environment. On the other hand, public opinion and speculation over the anticipated effects of known and traced substances, has soared as the media has brought many of these issues into open discussion.

3.5 No Governing Responsibility for the Pollution Effects During the Life Cycle of Manufactured Goods

Figure 1 clearly illustrates that safety efforts should never be neglected during the life cycle of a product. The problem is that several parties tend to be responsible for a product during its life; i. e. the supplier, manufacturer, distributor, user/consumer, garbage or waste processor etc. The specific interrelationship between these parties is, however, not covered.

The division of labour within society implies that responsibility tends to be shifted during the life cycle; the exception to this, to a certain extent, is the EC Directive and its inclusion of strict liability for products. The division of labour means that it is impossible to coordinate the disposal of thousands of different substances. Indeed, it is often not always even clear who the actual manufacturer of a product is. Disposing unknown elements safely is an impossible task.

3.6 Instead of Untertaking the Task of Regulation, the Government Duty Now Tends, Simply, To Be One of Ratification.

By definition, ratification implies superior knowledge on the subject under discussion. We all know that this is not the case concerning government bodies. To avoid complication and addressing the real problems, unstructured regulations are designed and vast teams of inspectors are employed to undertake time-consuming inspections. It is no longer a question of how to protect the environment, but who is, in fact, capable of undertaking this regulatory task. Government bodies have tended to use the one molecule theory and establish hypothetically "safe" levels, which usually only implies that the levels are less than those of last year. It is necessary, instead, that they create high ethical standards and address the whole problem. This appears, at present, unlikely.

In the battle between government and industry, it is the insurer that stands in the middle. In many cases he is passively forced to pay, without the possibility of undertaking appropriate action, due to the difficulties involved in standing up to the strength of bureaucracy.

3.7 Insurance Has Been Cheaper Than Providing Remedial Solutions

For many years, under the negligence liability theory, insurance companies provided coverage for poorly arranged installations which were high pollution risks. They were only concerned with spectacular and sudden accidents and excluded the dangers of low dosage, gradual pollution risks. The dispute then, inevitably, arose as to whether a hole in an underground pipe, caused by corrosion, should be considered gradual or sudden. As a number of court rulings were unfavourable, and with insurers providing full coverage under the premise of "hope, pray and reinsure", subsequent loss ratios began to reach catastrophic proportions. For owners of installations such as these, it was cheaper to buy insurance than provide preventative solutions.

3.8 Summary of Environmentally Induced Problems

The problems highlighted above can be grouped and related to the findings in Chapter 2.6. Line managers will be increasingly challenged by:

- greater uncertainties and reduced confidence levels between pathways and the dose-response relationship
- lower detection limits for substances without an increased understanding of their potential to cause damage
- unclear responsibilities in the chain of commerce
- complex influence from government agencies and the media, and
- confusion concerning insurance.

These observations increase the pressure on what is already a troubled situation with respect to risk management, and provides additional uncertainty.

4. The Zurich's Risk Management expectations

Since we are not managing environmental risks we have the right to expect a certain level of professionality from those wishing to have insurance. We believe that there is a need to provide pollution insurance for unexpected and unintended damage. However, to make solutions affordable and to provide ample capacity, the risks must be calculable and be of sufficient quality that the damage is not to be expected with 100% probability.

Different tailor-made solutions for such coverages can be designed. To do this, the risk management profile of a client, among other criteria, must meet the required expectations. They may be briefly summarized as follows:

4.1 Strong, forward-looking leadership at all management levels, documentation via a corporate safety policy, line management responsibility for all safety aspects, compliance with applicable regulations and excellent environmental safety performance. Our contact with the client has to be at the level of top management.

4.2 Active and systematic risk identification must be a permanent task of the company. A pollution risk analysis, based on one of the common inductive methods, must be presented by the client to us. This analysis must have been produced by the client and not by a consultant.

4.3 The process involved in defining an acceptable risk must reasonably and adequately cover the steps outlined in the "Zurich" Hazard Analysis Methodology.

4.4 Risk reduction must be undertaken, primarily, through 'state of the art' engineering solutions. By doing this, mistakes made by the operator will not lead to catastrophic situations.

4.5 Life cycle considerations must be incorporated for systems and products so that emissions and wastes are minimized through all the production stages.

4.6 Complete environmental safety data is to be kept on all substances, including their by-products, intermediates and waste.

4.7 There must be permanent, 'state of the art', monitoring of all emission potentials for gases, liquids, solids and energies that are to be covered.

4.8 Finally, permanent investigation must be made of all losses, and 'near misses' to leam from 'lessons of the past' that adequate corrective measures can be taken.

This applies, upon our verification, to all industries, including coverages for independent waste processes.

These preconditions are in accordance with good risk management practices and considerations concerning environmental factors (as outlined in the preceding section). We cannot solve the problems related to environmental pollution, but this paper has shown that insurance support is available where adequate technology and professional management exist.

We cannot afford to support sub-standard solutions and compensate for losses where environmental protection was neglected; this would be to the detriment of the environment and to ourselves. We are, however, prepared to help in the case of genuinely unforeseeable events and circumstances. Here, once again, the basic criteria of insurability apply.