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Safety Culture

A Reflection of Risk Awareness

Report By:- Swiss Re

The concept of safety culture arose with the development of technology and the associated concentration of risks in single production centers. The importance of plannable, reliable systems with a high level of safety has increased in line with the growing concentration of risks.

In the high-risk area of industrial production, the term (safety culture) has today become a permanent part of our ideas on safety. In the safety sciences and in practice, however, this comprehensive but vague term is not clearly defined, though it has become a rallying point for attempts at an integral understanding of organizations and all the interacting functions that aim at ensuring safety.

The emergence of the term can be linked to various developments in the safety sciences. From each of these trends, it is possible to deduce specific requirements for the design of high-risk systems, which can be considered as characteristics of a safety culture.

The sociotechnical perspective

Increasingly, attempts are being made to go beyond descriptions of the individual and his behavior in dangerous situations; rather, high-risk production processes are thought

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The Environment

Pollution Insurance: What is the Problem?

Report By: - Scor Re

It has become customary to introduce the difficult subject of pollution insurance for industrial sites by starting with an account of the trials endured by American insurers over the past 15 years. They have had a bitter pill to swallow: hundreds of interminable lawsuits involving tens of billions of dollars. Nevertheless it would appear that because of inordinately exacting environmental legislation and judicial practices that are sometimes extravagant, the experience of the United States cannot be transposed to the European market without some reservations. So it seems useful to take stock of the real problems raised by coverage of this risk, which, apart from certain exceptions, have not yet caused a financial catastrophe in Europe.

The difficulties with this insurance product stem from serious technical, legal and insurance uncertainties.

Technical assessment is difficult,

The first difficulty encountered by a pollution insurer is weighing up the risk. Deciding the level of environmental protection at an industrial site and assessing the consequences of a possible accident call for methods that are still being developed and increasingly complex and detailed technologies, all of this in a rapidly changing regulatory framework. Insurers are starting to establish teams of engineers trained in the subject, but we are still far from being able to put in place certification procedures such as those used in fire insurance for well protected risks. It is doubtful whether we will ever be able to do so.

Or physically impossible

Although an expert can nowadays determine the insurability requirements of a single site, things arc not so simple with large industrial groups operating on many sites. For them, insurers have to rely on indirect methods, monitored by sampling at a limited number of plants. This

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of as being a part of more comprehensive systems. James Reason, who has done extensive research on human error, has described three overlapping time periods:

In the ***technical*** phase, around the beginning of the twentieth century, the most common cause of accidents was considered to be technical failure: thus, companies invested in technical solutions to the safety problem. Yet it soon became clear that no technical safeguards, however ingenious, were sufficient to rule out human error.

In the next, the ***human error*** phase, man himself, now confronted with increasingly sophisticated technology, was recognized as the most important source of errors and the main cause of disturbances and accidents. Management therefore intensified its focus on the human risk factor by trying to improve professional competence and training, or by choosing suitable operators through personnel selection. Yet a series of notable accidents highlighted the increasing complexity of technical installations, and it was gradually recognized that one-sided improvement, either of the technical system or of personnel, brought unsatisfactory results.

Thus, in the ***sociotechnical*** systems phase, the realization gained acceptance that errors and accidents can only be understood on the basis of the complex interaction between humans and technology in an organizational structure. In consequence, measures must always be planned and implemented with a view to the effects they will have on the system as a whole.

Linking social and technical subsystems

The central idea of the sociotechnical systems approach is to link social and technical subsystems, taking the interactions between the two into account. For example, the question as to whether a certain task should be carried out manually or automatically might be restated as follows: (How can human skills and technical resources be used so that humans and technology together can perform a task which neither could manage alone?)
From this perspective, a measure for increasing safety should not start selectively with humans, technology or the organization, but must permeate the entire working system, ie always be considered in relation to the other subsystems. The way the subsystems are linked thus determines the quality and safety of task fulfillment

A high degree of self-regulation

Another central idea associated with the sociotechnical systems approach is that of regulating variances and disturbances at the point of origin, ensuring that problems or errors are not carried over into the next shift or into the next work step. This is predicated upon work teams that are in large measure self-regulating: individual employees are given a degree of autonomy and the means to supervise their own work. A high degree of self-regulation makes / it possible for the operators to respond independently to disturbances for which there are no regulations or guidelines.
This is because situations arise which require independent action despite very detailed rules and regulations. Why else is (working to rule) doing everything (by the book) - a form of strike action?

In highly automated systems it is necessary to take account of new types of risk. Technical systems are developed in order to eliminate human operators as a disruptive factor as far as possible; but as soon as the technical system shows deficiencies, the human is expected to take fast, unerring action despite being under generally greater stress as a result of the disruptive situation, possibly fatigued from long, monotonous monitoring phases, and unused to doing the jobs normally carried out by the automated system. Precisely because they are excluded from the production process as far as possible, the tasks employees are then expected to perform are very critical -tasks with which they are ultimately unable to cope.

Self-regulation is dependent on structure

Self-regulation is also predicated on organizational structure. Organizational units should be able to handle complete tasks independently of other units. All work steps for fulfilling a task - from setting the objectives, by way of planning and execution, to quality assurance and fault correction - should accordingly be carried out within one unit of organization. Within the units, tasks should be shared out so that employees can make independent decisions on all work steps on the basis of mutual agreements. Such shared-task orientation Promotes employee motivation. The work content must itself be motivating, for motivation must go beyond external factors like financial incentives or inspections by supervisors.

The definition of safety culture and its elements

Safety culture is the sum of all safety-related assumptions and norms that are shared by the majority of an organizations members, and which find their expression in the way safety is actually dealt with in all areas of the organization. The

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figure below summarizes the elements of a good safety culture. More detailed Characteristics can be derived from these.

Safety management characteristics

The following features are of particular importance for safety management:
Proactive promotion of safety

- Strategic and operational safety goals for all company areas
- Resource planning as commitment to the promotion of safety
- Survey of negative and positive safety indicators
- Institutionalized process of continuous improvement

Sociotechnically integrated system design

- Safety systems (technical and organizational) that are equal to the task
- Self-regulation in small control loops
- Individual motivation through task orientation
- Controllable technical systems

Value-conscious actions

- Actions (individual and collective) reflect safety awareness
- Balance between central supervision and autonomy
- Participation of all concerned in decision-making and change processes
- Open, questioning attitude with respect to practices and guidelines

How does safety culture work in high-risk systems?

A common culture can assume both coordination functions and integration functions. A safety culture shared by everyone is thus both the expression of a common safety philosophy and a necessary basis for setting up and implementing a safety management system. The culture is also considered to promote system effectiveness.

Coordination function: Common agreement at the level of values and norms facilitates coordination and the formation of consensus, because a basic understanding of important safety questions already exists. A shared culture can often take on part of the management and supervision task more effectively than elaborate, structural means of coordination, reducing the need for formal regulations and administrative instructions.
Studies of high-risk systems especially have shown this coordination function to be particularly important. Such high-risk installations, which require a high level of safety and reliability, must have a common core of cultural values in order to promote purposeful forms of behavior even in unforeseeable situations. Indeed, this is the central task of corporate culture: to control through norms, values and unwritten rules those elements that cannot be managed efficiently by formal means. A basic consensus rooted in the culture is also a motivation factor where working conditions are appropriately organized. Safety culture is thus an orientation tool that promotes goal-oriented behavior as it maintains the individuals freedom of action and autonomy in achieving those goals.

The integration function of corporate culture is important in large, decentralized multinational companies. The autonomy of the different sections allows subcultures to develop. Because of their creativity and potential for change, this is a desirable development, but one that should be steered in a specific direction by higher-level corporate culture. Though subcultures may aggravate conflicts between different ways of handling risk and safety, integrating them into a higher, dominant, corporate culture can often prevent this. The concept of safety culture allows the company and external observers alike to reflect on and evaluate the way the company operates as well as the way its values and norms promote safety.

Risk assessment is also changing

Today, the technical measures for preventing and fighting fires are no longer seen as sufficient to guarantee the safety of an industrial risk; and by the same token, a traditional fire safety inspection by a fire surveyor is no longer adequate as an assessment of risk quality. Though differences exist from region to region or from one industrial sector to another, there is a general tendency to expand the approach to safety to include many more aspects and areas than formerly.

From about the mid-seventies, major companies increasingly emphasized preventive measures at their plants. They recognized that merely installing safety devices to limit the extent of a loss event already in progress was no longer adequate to protect ever more complex installations and processes. Even today, companies are still learning about the importance of rigorous

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safety organization, a carefully considered emergency plan, and effective crisis management in addition to technical protection.

In more recent years, high-tech, risk-conscious industries such as aviation and petrochemicals have focused more of their effort on the human risk factor. The resulting measures cover a broad range: specific employee selection, behavior training, team-building and training in hazard recognition, to name a few. These methods have enabled the companies that apply them to further reduce the number of work accidents; and obviously, any satisfactory means of risk assessment must be capable of evaluating the effect of these measures as well. Surveyors, too, must consider these factors if their risk assessments are to reflect the related improvement in risk quality.

Introduction of the human factor into the safety equation has far-reaching consequences, however. It increases the number of basic approaches from two to three, changing the simple, dual relationship between the technical and organizational approaches to safety into a triad. This makes it necessary to include a great many complex interrelationships, and leads inescapably to a consideration of safety culture.

Swiss Re has spearheaded the development of a method, the Safety Management Audit in the Process Industry, or SMAPI, designed to ensure uniform, reliable results.

Auditing organizational safety: SMAPI

Swiss Re has spearheaded the development of a method, the Safety Management Audit in the Process Industry, or SMAPI. SMAPI audits use a systematic list of questions. This provides a common base for conducting interviews in different plants. Various departments and sections are interviewed: management, operations, maintenance, inspection, loss prevention and engineering.

The interviewer talks with small groups usually made up of staff from various hierarchical levels including management. The interviews systematically highlight various aspects of the safety system: organization, production equipment and facilities, procedures, job instructions and general safety aspects.

The audit examines various subjects, arranged into several overlapping areas. This enables a check of the homogeneity of the attitude toward safety. The questionnaire is divided into four parts:

- questions to be answered prior to the visit;
- questions to be answered during the meetings;
- questions on the auditors subjective assessment (that cannot be asked directly); and
- questions that can only be answered by inspecting the plant firsthand.

The question technique aims at standardizing the information-gathering process, making it possible for the risk visit to proceed efficiently while still leaving useful room for subjective risk assessment.

According to the SMAPI philosophy, it is the weakest link in the organized chain of safety measures that allows errors to filter through and potentially cause an incident. In other words, vulnerability is a function of the weak points in the safety management system, and the risk surveyor should inform the company of any signs that he considers being indicative of a weak point. Such hints can help improve the safety system.

The subjective surveyor

During the audit, a risk surveyor gathers a wide range of impressions, which he processes and classifies according to his own values. These include impressions acquired during interpersonal communication, and it is hard to suppress likes and dislikes. The extent to which such factors affect the result of a risk assessment is uncertain. There is no doubt, however, those impressions such as these do distort the facts.

The surveyors judgement is also affected by his past experience and the value structure he has developed over many years. What applies to one specialist does not necessarily apply to another. Therefore, while subjective risk assessments may indeed be comparable, they will never be identical. Many-layered aspects of culture the companys and the surveyors are combined and superimposed.

Also, the audit of a company is a (snapshot) that exposes temporary conditions resulting from extraordinary occurrences as well as stable, long-term characteristics. The surveyors have the difficult task of interpreting what they have seen and heard. They must weigh whether the poor housekeeping which a supervisor explained as being due to recently completed maintenance work is really only a short-term failing that should not be taken into account, or whether it in fact makes a more general statement about the company. The same applies of course to (positive) characteristics: Are the operators in the control room so well informed about the rules only because an in-depth review has just taken place, shaking them out of their normal, lax routine

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1999 D&O Survey Reports Rising Costs of Claims from Shareholders and Employees

International Risk Management Institute (IRMI)

The 1999 Directors and Officers Liability Survey found rising average costs of claims against directors and officers from shareholders and employees, the two most frequent sources of D&O claims. These increasing trends in claims costs occurred while overall pricing for D&O liability insurance declined for the fourth consecutive year. (For further details on D&O insurance pricing trends, as well as background on the survey and its participants.)

Approximately 25 percent of U.S. survey participants and 13 percent of those from Canada reported one or more claims against their directors or officers over a 10-year experience period. The 1999 survey results confirm the increasing claims frequency trend we have seen develop over the last 5 years for organizations in many size groups. Claims severity was higher for most claimant groups in this years survey, although average payments to claimants and average defense costs were down somewhat overall because of a continuing increase in the frequency of (lower cost) claims from employees.
Companies with a history of merger, acquisition, or divestiture activity were more than twice as likely to experience a claim against their directors or officers. Firms with fewer than 500 shareholders were less than half as likely to experience a D&O claim as their more widely owned or publicly traded counterparts. Educational and health care organizations and large banks reported the highest claims frequency of the U.S. business groups analyzed in this survey. The transportation and communications business class was next, with communications firms reporting a large number of claims per company. Note that the transportation and communications group reported the highest frequency of D&O claims among our Canadian survey participants.

Survey respondents. Shareholders are the most frequent source of D&O claims against publicly traded companies, while employee claims are most frequent for private companies and nonprofit organizations. The continuing high number of claims from employees reported in our survey reaffirms that the most significant increase in the incidence of claims made against directors and officers and their organizations in recent years has been because of employment practices liability (EPL).

Discrimination in employment was the most frequently cited D&O claim issue (27 percent) among U.S. participants in this years survey, followed closely by claims involving wrongful termination, financial disclosures, or related to mergers and acquisitions.
Mergers, acquisitions, and divestitures were the most frequent general issue generating D&O claims for many

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hit-and-miss method is hardly satisfactory because it is these groups whose sites are most exposed to risk.

Risk is hard to calculate

A second tricky point is assessing financial exposure. As far as loss insurance in concerned, this can be calculated with some precision, but this is not the case in the area that concerns us here. Potential losses involve not only the replacement cost of the insureds own property but also environmental cleanup costs, which may easily come to more than the value of the property insured, and loss caused to third parties, which in some countries is unlimited.

A shifting legal situation...

The uncertainties are probably greatest in the legal field. The whole range of environmental questions is governed by jurisprudence that is emerging from very varied and complex legal texts which, on an underpinning of civil law, are establishing a body of specifically environmental laws which are very technical and which often override the usual rules. What is more, these laws are changing very rapidly and are introducing new notions such as no-fault liability and shifting the burden of proof (suspected polluters must show that they are not responsible for the damage), or even de facto retroactivity of laws or standards: lawmakers or judges can decide that situations previously considered acceptable henceforth require expensive cleanup operations.

...That is very complex

Pollution insurance straddles direct loss insurance and legal liability insurance (LL). It is therefore vital to determine the legal status (own property, third-party property, and common property or res nullius) of the environmental elements at risk: watercourses, water tables, air, countryside). This raises the acute problem of how to define the word environment and set limits on it. It is essential to know what type of cover will apply to potential losses. The reply can vary widely from one country to another. In the Netherlands, for example, the law on surface water is drafted in such a way that polluting it can not give rise to compensation for individuals. Similarly, insurers must take a very close interest in everything related to what is termed ecological damage, that is, to res nullius, assets belonging to no-one, not even the community at large; for example damage to an unused natural habitat or aesthetic harm to the countryside. These losses, which arc liable to be the subject of all sorts of irrational outbursts, can hardly be covered at all.

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Strong national differences

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Another characteristic of the pollution insurance market is that is very segmented. National differences are so strong that conditions have to be revised every time you cross a border. Everything changes:
environmental legislation, legal liability laws, judicial and administrative practices, industrial standards and methods, and, perhaps most important, peoples attitude towards protecting their rights and the environment. It is clear that the countries of northern Europe are much more problematic for pollution insurers than those in the south, but on the other hand their regulations are more straightforward. Building the European Union will simplify matters eventually, but this is a long-term prospect. Meanwhile, pollution insurers and reinsurers will have to bear a heavy and unending burden of paperwork.

Gradual or accidental pollution?

The ABC of the pollution insurance business is to distinguish between accidental and gradual pollution. Accidental or more accurately sudden accidental pollution is the swift result of a brief occurrence at a known time. The cause of the accident, its manifestation and the damage caused are practically simultaneous. It is therefore easy to determine whether or not the event occurred while the policy was in force

Gradual pollution on the other hand develops slowly before it is noticed - a typical example is an underground leak from a corroded pipe. Corrosion develops, then the first drop seeps from the pipe, and later, at some indefinable moment, pollution can be said to have occurred; it is even later that the first signs of damage appear, and some time after that when victims file their claims. This spreading of the pollution over time sets a problem for insurers: what date should be fixed for entitlement to compensation, bearing in mind that the cover taken out (or not), the sums and the partners involved change over the periods insured?

Retroactive and extended cover

There are two other difficulties: compensation for loss caused by pollution that occurred before the policy was signed (prior acts cover) - which is a legitimate claim if the policyholder was unaware of the existence of the problem at the time of signature -and loss that appears after a policy expires but results from events during the period insured (extended cover). In this case too claims can be legitimate when the policy has been terminated because the holder has gone Out of business.

Date of third-party claim

Insurers have traditionally dealt with the problem of gradual pollution by using (claims made) clauses to determine the timely application of cover, based on the date of the first claim made by an injured third party. The great interest of these clauses is that they enable the loss to be linked firmly to one insurance year, independently of the policyholder, and they allow full or partial retr
basis has the clinching attraction of enabling them to calculate their financial exposure at the end of the insurance year. Unfortunately, these clauses are not to the liking of the judges and policyholders. The jurists base their criticisms on application of broad legal principles. Their legitimate purism clashes on this point with the no less legitimate pragmatism of the insurers. In practice, offering the retroactive cover mentioned above logically implies refusing extended cover: insurers cannot cover an excessive period on a single insurance year. Insureds therefore fear that after their policy expire they will face a cover gap for losses resulting from past events that have not been taken over in new policies.

Or of first manifestation

For these reasons, in France and Germany we are seeing the emergence of clauses basing timely application of cover on the date of first manifestation of the pollution, along with a time limit on extended cover. It is too soon to tell whether clauses of this type will stand up in court and what their economic effect will be. They are in any case only a makeshift solution.

Direct loss or LL?

Pollution claims raise one particularly acute problem for insurers: pollution knows no property boundaries and after affecting policyholders it is very likely to harm their neighbors. We therefore have to deal with two very different regimes; covering policyholders own property (direct loss) and legal liability (LL). The problem is further complicated by the fact that the loss might consist only of a legal or moral obligation to clean up, without there being any real damage to property, and especially because it might be in an LL insurers interest to finance a cleanup to avoid damage or reduce its impact. So in most cases the same contract will have to provide mixed cover for direct loss, LL and pollution. Cleanup costs. Reaching a difficult compromise can only do this.

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The importance of cleanup costs

Very close attention must be paid to cleanup costs. These costs, involved in both direct loss and LL, seem from experience to account for the greater part of claims costs.
Pollution LL insurers usually stipulate that they will cover only costs for eliminating or reducing damage to a third party. This practice does not seem to be very satisfactory. It is a poor protection for insurers; it deprives policyholders of cover that they really need and is often a cause of litigation between insurers and insureds. It might be preferable to provide coverage for these costs in the form of named perils insurance, bearing in mind that this type of cover would necessarily be expensive.

Complex insurance and reinsurance techniques

It is becoming increasingly impossible to cover pollution risk by using the traditional methods of mobilizing the financial capacity required: treaties between direct insurers and reinsurers, or case-by-case (voluntary) reinsurance. Many insurers in fact do not feel they can commit themselves with such uncertain medium-term visibility. So special solutions must often be devised for this exceptional type of risk. These could include co-reinsurance rrangements o ool inancial capacity and technical expertise in an insurance and reinsurance market. Funding techniques could he used, or self-insurance through a captive insurance company. These solutions have been used for some years with other products, but they require high insurance skills

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1999 D&O Survey Reports

years. They were cited as the main claimant issue in 4 percent of the claims reported in this survey, less than one-fifth of our survey result from 1990, when more than 20 percent of the claims reported in that survey were principally related to mergers, acquisitions, and divestitures.

Inadequate or inaccurate disclosure, including financial reporting, was cited as the single most important issue in 6 percent of claims, compared to 10 percent last year and 8 percent in 1990. Disclosure and financial reporting replaced mergers and acquisitions as the most frequently cited general D&O claim issue in our survey results 6 years ago and remained the leading cause of D&O claims until 3 years ago. If we include claims related to stock offerings as well, more than 7 percent of all D&O claims were reported because of disclosure issues in general.
Allegedly inadequate or inaccurate disclosure by the corporation that led to financial loss.

The average nonzero indemnity payment among Canadian survey participants was about $0.7 million. This is down from about $0.9 million in last years survey but still more than double the comparable result from our 1991 Canadian survey.

Note that these amounts for indemnity paid to claimants and defense costs have not been trended or adjusted to current economic conditions. Our average (as reported) closed claim indemnity payment of $2.74 million for 1999 survey respondents, adjusted for trends and closed claim bias, translates into an expected future loss of more than $10 million for claims made in 1999, especially if we add defense costs to these nonzero indemnities

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Dear Reader
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