

Risk Management in Industry – An overview

Rapid industrialisation has brought in its wake several problems. One of them is 'industrial risk', which is taking newer and newer forms ever. With mechanical, electrical, chemical and radiation hazards besetting the industrial world, the 'Risks to Life, Limb, Health and Wealth' are common in this sphere of economic activity. Risks are present in every corner and under every stone. Industrial risks may arise while handling, storage or because of

services.

The Supreme Court judgement in the Delhi gas leak case and the Bhopal disaster case have added a new dimension to the issue of industrial risk. While the workers are worried about their life, managements are concerned over the financial liabilities likely to be imposed by an accident. The Supreme Court has held in the Shriram fertilisers industries case that if an enterprise is engaged in a hazardous or inherently dan-

the possibility of a 'risk event', sources of such event and impact of such event beforehand and consider ways and means of preventing, reducing or minimising the loss. A risk manager has to take necessary measures with least possible costs to bring the functioning of the organisation back to normal when the risk event takes place. Now, the corporate sector in India is increasingly recognising the importance of employing independent risk managers to manage their risks. In the changed scenario the main function of the risk management is that it should control not only the pure risks but also extend services to the analysis and control of all types of risks arising out of Business.

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The Bhopal Gas disaster in 1984 had added an altogether new dimension to the problem of industrial risk in India. Since then, the industrial workers have become more vigilant about their safety while the managements dread the financial liabilities likely to be imposed by an accident. The Corporate Sector in India is increasingly realising the importance of putting its 'industrial risk plans' in writing and employing a 'risk manager' to handle their risks. The article offers a peep into the concept.

operational errors and violation of accepted safety procedures. The industry, therefore, has to be always prepared for such eventualities.

An industrial risk is the one that may affect several areas within the factory or may cause serious injuries, loss of life, extensive damage to property and disruption to manufacturing activities. Such risks may occur in any industry in spite of best efforts to prevent them. The suffering and damage as a result of the accident is determined by the potential for loss surrounding the event. However, the risk can be largely avoided if effective action is taken as per pre-planned and practised procedures, utilising the combined resources of the factory and outside emergency

services. The industry, therefore, has to be always prepared for such eventualities. An industrial risk is the one that may affect several areas within the factory or may cause serious injuries, loss of life, extensive damage to property and disruption to manufacturing activities. Such risks may occur in any industry in spite of best efforts to prevent them. The suffering and damage as a result of the accident is determined by the potential for loss surrounding the event. However, the risk can be largely avoided if effective action is taken as per pre-planned and practised procedures, utilising the combined resources of the factory and outside emergency

Objective of Risk Management

The main objective of risk management is to protect the property, earnings and personnel of the organisation against losses and legal liabilities that may be incurred due to various risks. It minimises cost of the risk and maximises the profitability. The accidental risks may not only result in unexpected costs to a company but threaten its survival altogether. Thus, it is essential for the management to do some exercise to know about

Concept of risk

Risk may be defined as uncertainty of loss. A risk has been defined in the concise oxford dictionary as "hazard, chances of bad consequences, loss, etc. exposure to mischance". A risk in the commercial terminology is an unwanted and uncertain event. An operational definition of risk is that it connotes uncertainty concerning financial loss and uncertainty concerning the outcome of fortuitous events. In respect of some uncertain events, it is possible to obtain fairly reliable estimates of the chance of occurrence of such event or outcome of such occurrence. If all possible outcomes of an event are known, then the probability of the particular outcome can be calculated by employing the mathematical laws of probability. However, only some of

the uncertainties are amenable to such estimation, but in many cases past experience can provide a guide to future events or losses. One concept of the risk is the probability of loss. For example the Cement Manufacturing Association is having 55 members (companies). There are 127 large cement plants and 365 mini cement plants in India. The number of major fire accidents for 5 years from 1993 to 1997 occurred in cement plants is one in 1997, two in 1995, two in 1993 incurring loss of more than Rs. 50 lakhs in each incident. Based on past experience, the probability of suffering a major fire accident in cement plants is 0.0020 in a year. Therefore, provided that there is no change in conditions, it may expect that each year an average of one factory will suffer a major fire accident. The actual number of fire accidents may vary. It is also not possible to say with accuracy that a particular factory may obtain loss in a particular year. Hence, even with a reliable estimate of the probability of loss, its future loss experience will remain in doubt.

Classification of Risks

Risks may be classified broadly under two heads—Speculative or Business Risk and Pure or Accidental Risk. Classification of risks with various factors in their sequence is illustrated in figure I. The basic theory of risk occurrence with the various sources in their sequence is illustrated in figure II.

Speculative or Business Risk: It involves financial gain or loss and is the concern of the functional management, which consists of

the departments of Production, Engineering, Marketing, Finance, Material and Personal in an industry. It is not possible to obtain insurance protection against business risk since it is in the nature of dynamic. The sources of business risk can be classified into four categories as given below.

(a) *Technical factors:*

Technological changes and Obsolescence

(b) *Social factors:*

Consumer/supplier behavior and Industrial unrest

(c) *Economic factors:*

Actions of competitors, Change in prices, Tax policy, Business cycle and Inflation

(d) *Political factors:*

Government policies, Nationalisation, War, etc.

Pure or Accidental Risk:

Pure risk always results in a loss and is the concern of risk management. Insurance is normally arranged against these risks. The main sources of pure risk are classified into five categories as given below.

(a) *Faults of persons:*

Improper attitude (psychological), Lack of knowledge or skills, Anatomical or Physiological unsuitability, and Improper mechanical or physical environment.

(b) *Chemical factors:*

Fire, Explosion

(c) *Technical factors:*

Machinery breakdown

(d) *Natural factors:*

Flood, Storm, Earthquake and Lightning

(e) *Social factors:*

Riot, Strike, Terrorism, Theft, Frauds, Negligence.

Types of losses

(a) *Damage to Property*

Damage to the fixed assets like buildings, plant and machinery, equipment, furniture and fixtures, vehicles

and current assets like stock of raw material, inventory of stores and spares, finished goods, semi-finished goods and cash.

(b) *Legal Liability*

Company is liable to the third parties, customers and employees for the consequences caused by the failure, negligence or other tortuous acts of the company when risk is operated.

(c) *Personnel losses*

Compensation and medical expenses to the deceased, injured or disabled employees are additional costs to the company.

(d) *Pecuniary losses*

Loss of sales, loss of net profit, increased cost of production, business interruption and additional fixed costs are the pecuniary losses to be borne by the company.

Process of Risk Management

The process of risk management involves the following steps.

Planning - Investigation and Identification of risk

- Evaluation of risk

Decision-making - Selection of risk control techniques

Organising - Implementation of risk control techniques

Controlling - Evaluation with actual

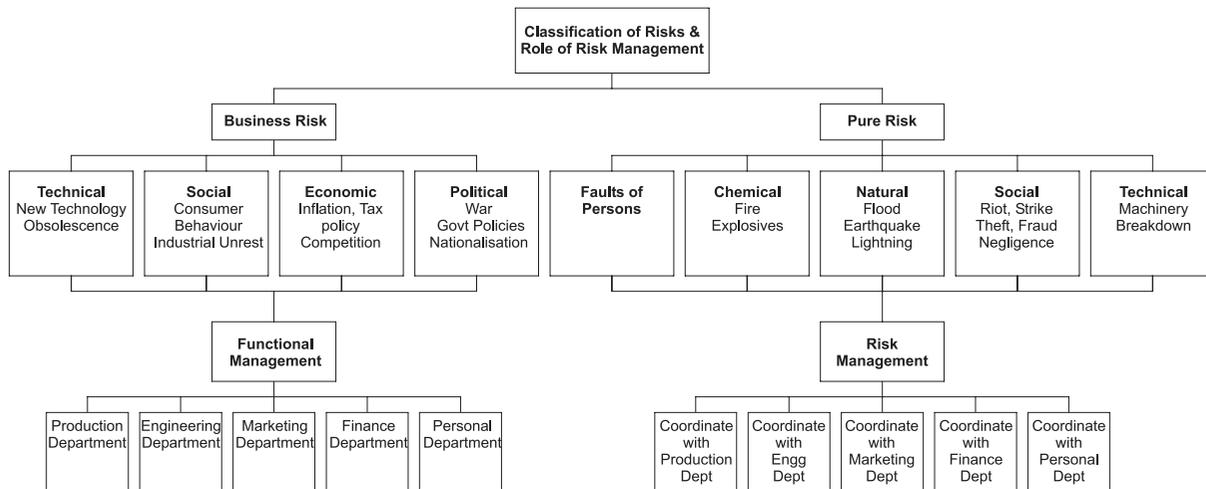
(a) *Planning*

Planning involves investigation, identification and evaluation of risk areas, risk sources or risk events. It is a process, which ascertains objectives, goals, strategies, policies and procedures to be followed by the risk management.

Investigation and identification of risk exposures: The preliminary step in implementing a risk management

The main objective of risk management is to protect the property, earnings and personnel of the organisation against losses and legal liabilities that may be incurred due to various risks

Figure – I



policy is to identify all the sources of risk to which an industry is exposed. Any failure to identify the sources of the risks will put the industry in jeopardy. It is the first task of the risk manager to pinpoint the risk sensitive areas and situations with significant loss potential before going to identify the perils and hazards associated with it. The risk manager has to examine in detail every aspect of the operations from initial stage to the last stage of the production and sale. He need not be a technical expert to identify a risk in the factory. He should be an expert in controlling a risk but not in the basic identification. The following activities are to be undertaken in risk identification process.

- (1) On site investigation.
- (2) Physical survey of premises and operations.
- (3) Discussion with operators.
- (4) Conducting brain storming sessions.
- (5) Studying the manufacturing process and related activities.
- (6) Obtaining details regarding procurement

- (7) Studying the behavior of consumers and suppliers.
- (8) Studying the flow charts.
- (9) Examination of past losses in similar or related industry.
- (10) Threat analysis i.e. list of events and hazards that could threaten.
- (11) Event analysis which highlight the possible loss making events.

Evaluation of risk: This process involves arranging of risk exposures in order of priority on the basis of both impact and probability of occurrence and providing information for selecting the technique for handling them. Risk manager has to obtain a probability distribution of loss by size of loss for each type of loss making event. Then he has to evaluate the loss expectancy, the standard deviation, maximum possible loss and minimum estimated loss. Maximum possible loss is that which may occur under the most unfavourable circumstances and as a consequence, the

fire is not fought against and therefore is only stopped by impassable obstacles.

Estimated maximum loss is the extent of fire likely to occur under the normal conditions of activity, occupancy and fire fighting of the range of buildings concerned. The unusual circumstances, which are likely to modify the normal conditions, have not been considered in this case.

The following costs are to be evaluated at this stage.

- (i) Cost of the risk operating
- (ii) Cost of risk control methods
- (iii) Cost of insurance

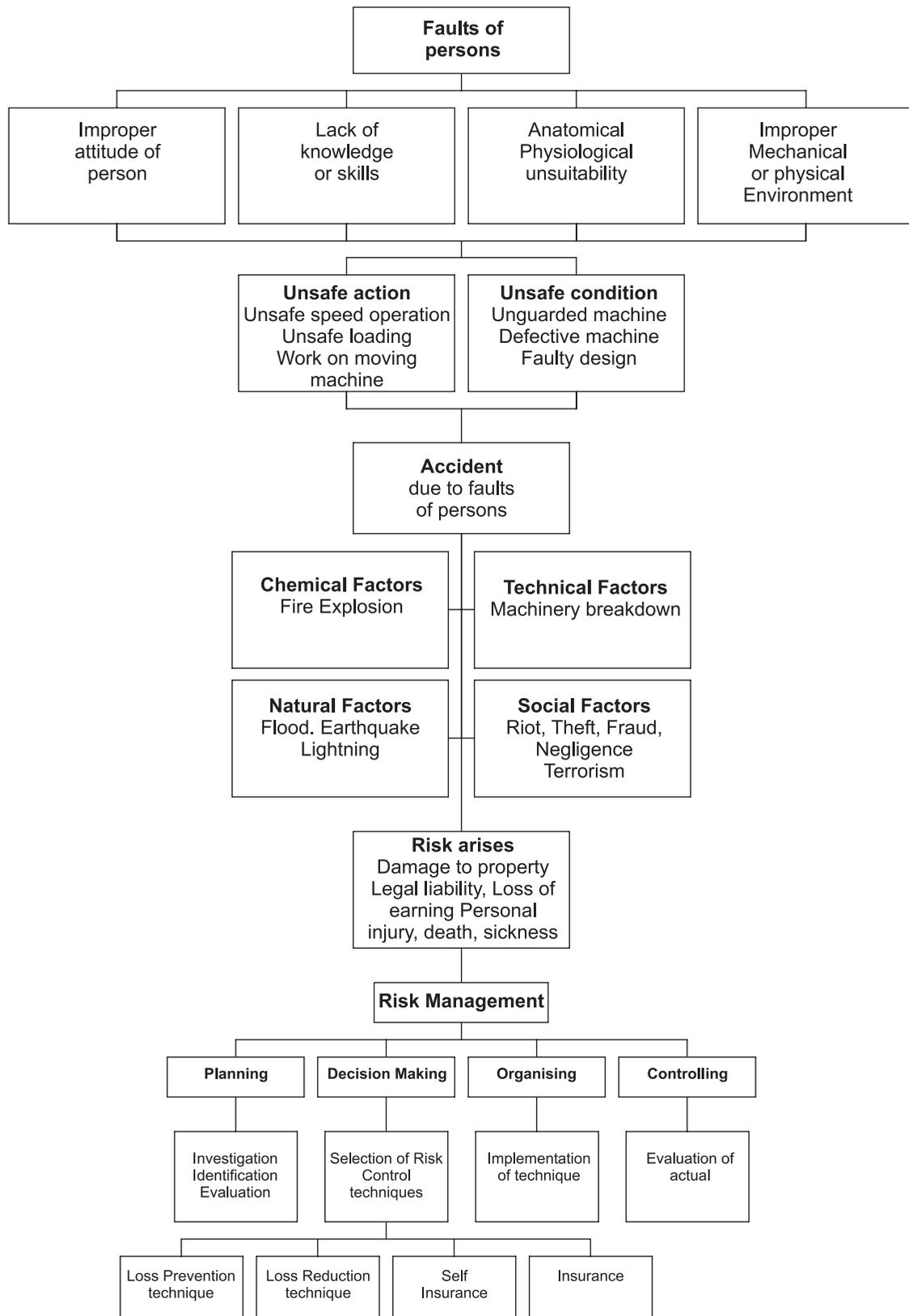
(b) Decision-making

This process involves listing out the remedies such as loss control techniques available to deal with each type of loss exposures and select a suitable technique or a combination of techniques. These techniques are loss prevention or risk avoidance, loss reduction, loss absorption or self-insurance, loss transfer or insurance.

Loss prevention or risk avoidance: Exposure avoidance is

Figure - II

SOURCES OF RISK AND RISK MANAGEMENT IN INDUSTRY

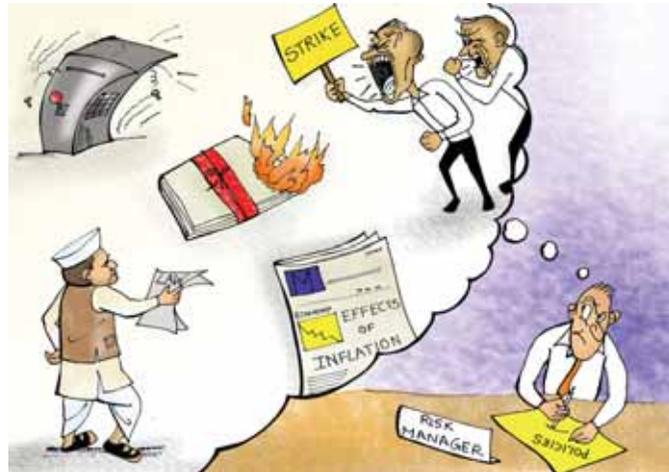


one technique for risk control. Generally, risk avoidance is possible at the planning stage of the operation. For example, rejection of a site that is hazardous, and subsequently the selection of an alternate site. In some cases, the company does not carry any activity, that could lead to a loss. For example a chemical company could stop the handling and use of highly toxic chemicals such as MIC.

Loss reduction: Loss reduction is the best technique to deal with any risk. Here, steps are taken to reduce the frequency or likelihood of loss by building in a safety-awareness at all levels of management and by using technical expertise of outside agencies. The expenditure incurred at this stage is to be evaluated with potential future savings in losses. The following measures are to be taken at this stage.

- (a) Safety education and training
- (b) Safeguarding all machines and equipment
- (c) Safe design and construction
- (d) Safe dress and personal protection equipment
- (e) Safe methods of work
- (f) Preventing or removing defective conditions
- (g) Fire precautions
- (h) Pollution control and environment protection
- (i) Maintaining hygiene and healthy conditions
- (j) Installation of fire-alarm system and fire hydrant and sprinkler
- (k) Warning devices for leakage of hazardous gases
- (l) Incentive to employees for accident-free record

Loss absorption or self-insurance: Here, a company can absorb some of the acceptable risks by either not effecting insurance against



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such risks or by a process of self-insurance. In case of self-insurance a fund is created to which the losses are debited. Self-insurance becomes necessary when the risks can be retained and the insurance cost is high. Small losses occurring in high frequency can be retained under self-insurance. In the case of large organisations it may be beneficial not to insure and especially when insurance cost is more than possible loss that may occur on account of accidental risks. Every company may have tolerance level to absorb the maximum loss depending on its cash flow, profitability, liquidity, resources and assets that can be used to meet the loss. The following five factors are to be taken into account by a company in risk absorption.

- (a) Probability of a loss-making event occurring
- (b) Possible loss in severity
- (c) The size of loss it can tolerate
- (d) Remedies available
- (e) The major variation in actual outcome when compared to the estimation

Loss transfer or insurance

Higher losses occurring in lower frequency can be transferred or insured. In this case, a company enters

into an agreement with unrelated company like an insurance company to restore loss by taking a policy and on payment of premium. Insurance can be arranged on indemnity value basis or reinstatement value basis. The company should not find itself a victim in case risk is operated.

The following are some of other methods available to transfer the risk.

- (a) Sub-contracting the work to another company
- (b) transfer the responsibility for the consequences of risk by suitable exemption clauses in contracts

The following factors are to be kept in mind while transferring the risk to insurer.

- (i) Insurable risk that affects the business
- (ii) The frequency of risk occurrence
- (iii) Type of risks
- (iv) Cost of losses likely to occur to the insurers
- (v) Compliance with statutory Acts such as Workmen Compensation Act, Motor Vehicles Act, etc.

In fact an optimum strategy is to have a combination of both self-insurance and risk-transfer to the insurance company. Risk

Higher losses occurring in lower frequency can be transferred or insured

A risk manager as the head of risk management has to coordinate with all functional managers to make judicious use of the combined resources of the organisation and outside services to safeguard the objective of the organisation

manager has to understand the financial aspect of the risk such as damage to the property, legal liability, compensation to affected persons and earning loss. Optimum cost benefit can be achieved as a result of efficient balancing of insurance cost and cost of self-insurance. For example insurance against flood risk may be a better solution than removing a factory to higher area with the resulted increase in costs of moving raw materials in and finished products out.

Organising

It involves implementation of the selected technique or combination of techniques for control of risk exposures and risk areas. Implementation of loss control strategy will require two types of decisions—technical and managerial. For taking technical decisions such as selection of insurance policy, decision on optimal fire protection system, etc., the risk manager needs technical assistance and advice of technical experts. Managerial decisions are to be taken by other functional managers in coordination with the risk manager. For example, a decision taken to install a water sprinkling system is to be implemented with coordination of risk manager by the concern functional manager. Hence, the management of risk is responsibility of every manager.

Implementation of selected technique: It also involves the following activities.

- (i) Arranging safety awareness programmes and installing safety system
- (ii) Negotiating with insurers for risk coverage
- (iii) Handling the insurance claims and get them settled
- (iv) Managing the self-insurance fund.

(d) Controlling

It involves monitoring the actual result with estimation.

Evaluation of actual: It involves evaluating the result obtained on implementation of the selected risk management technique. It provides necessary control for correcting the deviations when compared to the actual occurrence of loss or events. It determines whether the original selection of technique is correct or not. Even if it is correct, a corrective step can be taken in the case of changed conditions by changing the technique suitably. Sometimes it may warrant review of whole process of risk management itself based on the feedback information. The risk areas and values of such areas are to be reevaluated at regular intervals. Safety conditions and procedures are to be reviewed periodically to avoid any lapse and to update with latest technology.

Role of risk manager in risk management process:

Risk manager as the head of the risk management has to coordinate with all functional managers to make judicious use of the combined resources of the organisation and outside services to safeguard the objective of the organisation. He has to maintain liaison with insurers, surveyors and other outside agencies. He has to develop effective inter-departmental communication. He should be a good friend, guide, and supervisor to the subordinates. He needs to conduct the following activities.

- (i) Determine the policy of risk management
- (ii) Determine the areas of risk such as assets, personnel, liabilities, profits, etc.
- (iii) Decide on the risks to be insured

- (iv) Decide on the sum to be insured considering the premium payable
- (v) Decide on self-insurance strategy
- (vi) Find out ways and means to prevent, reduce or minimise risks
- (vii) Periodical review of the system and corrective steps comparing the actual with estimation

Conclusion

It is absolutely wrong to believe that once insurance is taken, all losses will be taken care of automatically. It is to be noted that many loss exposures are not covered under insurance. The industry has to manage its risks through good risk management and the insurers could be best partners in risk sharing. Though insurance offers compensation against economic losses it can never comfort the family of the deceased person. A conscious decision towards self-insurance could entail building of adequate safeguards such as physical devices, systems and controls. The industry must have an emergency plan laid out to face certain eventualities particularly of catastrophic nature. The disaster plan should be in a written form, and should contain the detailed plans and procedures to be adopted by various agencies, staff, operators, site engineers and managers who are responsible to act and control the emergency situation. The insurance programme is to be monitored continuously and revisions made periodically in order to keep the coverage of risk up to date. Now the insurance companies are also providing other services such as inspection services, conducting seminars and training programmes, etc., which may be utilised by the industry. □