

BEHAVIOURAL ISSUES IN ACCIDENTS : A STUDY

Pramod Pathak* & Govind Swaroop Pathak*

ABSTRACT

Accidents have always been an intriguing aspect of human life causing immense loss, pain and misery to mankind. In fact, in the Hindu religion, while worshipping the gods, one major boon, which people seek is to be saved from accidents. After every act of worship, which requires going through a complete set of rituals, a holy mixture of five liquids is to be distributed as CHARANAMRIT. While this is distributed to the devotees, a Sanskrit MANTRA is chanted seeking life to be free from accidental death and sickness. Read on to explore more!

INTRODUCTION

This Sanskrit Mantra from 'Vishnu Puran' can be read thus: —

*“Akal Mrityu Haranam, Sarva Vyadhi Vinashanam,
Vishnu Padodakam Pitwa, Punarjanmo Na Vidyate”*

(Vishnu Purana)

Paraphrasing this means, “I must be rid of accidental death and all sickness; as I drink this holy liquid that washes the feet of Lord Vishnu, I seek freedom from the cycle of rebirth.”

Fear from accidents has always been there in human mind and avoiding accidents has always been a major aim in worshipping the different gods and the nine planets known as “NAUGRAH” in the Hindu religious nomenclature. The Hindu religion recognizes three causes of misery, which are called *Adhidaivik*, *Adhivautic* and *Adhyatmik* of which the first two pertain to natural disasters and unforeseen event like accidents. Thus man has always been wary of accidents and has sought freedom from it be it through divine grace or modern techniques of science.

DEFINITION OF ACCIDENT

Modern Industrial psychologists have defined accidents variously: - According to Webster collegiate dictionary “accident is an event occurring by chance or arising from unknown causes”. However, yet another meaning given in the same dictionary is that accident is an unfortunate event resulting from carelessness, unawareness, ignorance, or a combination of various types of causes. There are several other meanings given for accidents. However, the essential element in all of them is the non-essential property of an accident i.e. lack of a design or pattern in any happening. But leaving it to that is hardly the way out. Man, by his nature, is not to take chance in his stride. He must make things, which he wants, happen and tries to ensure that things he does not want do not happen.

Moreover, accident is one thing which man never wants. Naturally, something needs to be done. For the early man it was chanting mantra or taking a few drops of the holy mixture of five liquids, which the

* Professors, Department of Management Studies, Indian School of Mines, Dhanbad

religious lingo called the *CHARANAMRIT*. Wearing gems and stones or observing rituals were also the means to avoid the unforeseen and unwanted. These practices are still there but mankind has come a long way since then and has developed a variety of tools and techniques to fight chance. Predicting accident, minimizing the impact of accidents are the aims of these tools and techniques. True, accidents still happen and continue to take a heavy toll. However, persistent as he is, man continues to fight. The one reason why man keeps on trying is because of the contribution of human error in accidents. All accidents have been traced to either unsafe acts or unsafe conditions and even unsafe conditions can in some way be attributed to unsafe acts.

The various definition of accidents in the extant literature is as follows: Lexicographically, an accident is an event that takes place without foresight and results in some type of personal injury and/or damage to equipment and property (Ghiselli & Brown, 1948). Hienrich (1959) views 'Accident as an unplanned and uncontrolled even in which the action or reaction of an object, substance, person, or radiation results in personal injury or *the probability thereof*'. Whereas Haddon et. al. (1964) view it as 'an unexpected occurrence of *physical damage* to an animate or inanimate structure'.

CONCEPT OF ACCIDENT:

It is pertinent to point here that some industrial psychologists have attributed accidents to error. But as in the case of other types of error – accidents do not just happen. Rather, they can be considered as being brought about by certain preceding circumstances and events, some of which may be associated with human beings, other by situational factors, many a times referred to as mechanical factors.

Depending upon the circumstances or purpose, accidents have been defined in various ways. Heinrich defines an accident as an unplanned and uncontrolled event in which the action or reaction of an object, substances, person, or a radiation results in personal injury, or the probability thereof. There are, as in mathematics, theorems in accident occurrence, as, for example:

- i. A personal injury occurs as result of an accident.
- ii. An accident occurs only as the result of a person or mechanical hazards
- iii. Person or mechanical hazards exist only because of the faults of persons.
- iv. Faults of person are inherited or acquired by environment.

The implication of this theorem may be explained in the form that an injury cannot possibly occur unless there has been a personal unsafe act / or exposure to an unsafe mechanical condition. To minimize accidents, then, systematic efforts will have to depend initially upon the availability of knowledge regarding unsafe act and unsafe mechanical conditions. These efforts will lead to knowledge that may help in getting appropriate corrective action. The tendency to err is a pervading human trait. Errors of various kinds can affect not only the quality of work that people do but also can contribute to injuries and fatalities. Human errors in work activities are so pervading that in every post facto analysis an accident can be traced to a lapse on the part of the human element.

From aircraft accidents to underground mine accidents human error has always played a part. According to a study conducted by *Boeing Company*, 60-80% of aircraft accidents worldwide can be attributed to human error. The study conducted by the *Boeing Company* took

into account air accidents between 1959 & 1985. The findings were that 74% of the accidents were due to crew error, 12% due to mechanical failure, 5% due to lack of maintenance, and 3% accidents were attributed to other reasons. This was revealed during the course of an international seminar on Flight safety held in New Delhi in Feb 1996. Similarly, the Directorate of rail safety in its report has stated that 68% of all rail accidents are due to failure of railway staffs. In fact, in its latest White Paper on safety of Indian Railway published by Ministry of Railway, Government of India, April 2003 it has been acknowledged that 65% accidents can be attributed to human failure. For the road accident also the majority of injury and fatality can be attributed to reckless road behaviour. It is true of mine accidents, too.

Despite all these successes of medical and social sciences man, woman and children continue to suffer from injuries sustained in the home, at play and at the work. Though a continual watch and record is kept of work accident and these are analysed at regular intervals by Government departments, safety organizations, and individuals having expertise in safety, accidents continue to happen. The nature and incidence of accident depend on many factors but attitude and mental status are almost always critical. The British Safety Council in its tabloid, *Safety and Rescue*, (July, 1972) reported the opinion of the safety officer from *Durham Coal Mine* that “*A morning kiss and cuddle from his wife ensure that a miner returns home safely at the end of his shift*”. His view is shared by the miners at his colliery. Having “something on mind” is within the experience of all of us and its effect upon concentration can be momentary or prolonged over a period during which the

whole behaviour may become altered, resulting in a series of episodes. Personal experience must colour our appreciation of an action to forestall accidents. Some are fortunate to have none, others to be either susceptible themselves or observe it in others. The experience gained in heavy engineering, mining and elsewhere cannot fail to impress a responsible people. Even “the Act of god” such as electrocution by lightning should bring home to people the need to take all reasonable precautions to avoid injuries.

Major issue in an accident remains the human error – may be because it happens to be a controllable component. The basic question then, that arises is what really constitutes an error. An operational definition of human error has been proposed by *Peters* as follows: “Any deviation from a previously established, required or expected standard of human performance that results in an unwanted or undesired time delay, difficulty, problem, incident, malfunction, or failure.” As pointed out by *Rook*, human error is somewhat synonymous with poor workmanship. Since workmanship frequently can be considered as varying along some continuum, it may be necessary to characterize that degree of workmanship that is considered unacceptable in terms of some appropriate standard. Sometimes, however, the consequences of an error are so clear that there is no question of degree. If in one way or other, it is possible to characterize errors in a situation, it is useful to determine, if possible, the human behaviour and the situational variables associated with the type of error in question. The cases when it is difficult to establish basic cause and effect relationship, such information frequently can serve as the basis for the corrective action.

Accidents are usually attributed to some physical causes in the environment or to a number of items related to the human factors. Classic studies were carried out by the Metropolitan Life Insurance Company to identify the major causes of accidents and various physical aspects of accidents were found out. Another major study was carried out on employees of Cleveland Railway Company for identifying the contributing human factors in accidents' occurrence. The study was carried out in co-operation with Metropolitan Life Insurance Company. An interesting aspect in this study was the finding that faulty attitude was an important cause of accidents. This study as well as many similar studies that precluded it led to the interesting finding that a relatively small group of people was involved in a large percentage of all reported accidents. Thus working under similar condition one can find a large number of people whose accident record is excellent, while a small group share the most numbers of the accidents. This finding apparently confirmed statements of psychologists and psychiatrists that accidents don't distribute themselves by chance rather they happen frequently to some men and infrequently to others due to a combination of circumstances. There are individuals who because of certain mental, psychological or physical defects fall to an accident when it arises, while there are those with the necessary physical and mental requirements who show little susceptibility to accident. These findings however focused accidents as an individual problem and could be reduced by studying individuals who met the accidents.

A majority of work on the concept and causes of accidents have been done in the western context. In 1931, H.W. Heinrich noted that there are two basic factors

leading to accidents: 'unsafe mechanical or physical conditions' and 'unsafe acts of persons', or the human factor. One may also refer to the work of Ghiselli & Brown, 1948., Heinrich, 1959; McCormick & Tiffin, 1974., Moore, 1942., Strong, (1938)., Tiffin & McCormick, 1965., Grimaldi & Simonds, 1975. However, there is a glaring lacuna in extant research on the topic of causes of accidents in coal mines in the western context.

Accidents in Coal Mines

The very nature of mining operations is such that accidents and disasters can strike any moment. And that they do strike with nagging frequency is obviously because mining is an attempt to destabilise nature more so in coal mining. The inherent chemistry of coal makes it more hazardous, and naturally worst fears come true: in the form of explosions, fires, subsidence, roof falls and inundations that kill and maim scores. In Mining literature, Accidents are classified as major when they cause 4 to 9 deaths. Accidents resulting in 10 or more deaths are called disasters (Kejriwal, 1994).

The first major mining disaster struck the Khost Coal Mine in Baluchistan (now in Pakistan) in 1899. It killed 47 people. Since, then more than 50 disasters have hit the coal industry causing more 2100 deaths. Four have claimed more than 100 lives each, and five of them more than fifty. Disasters causing 10 or more deaths account for about 10 per cent of total casualties in coal mine accidents.

While the overall safety statistics of Indian coal mines has significantly improved in last few decades, the frequency of disasters have remained unchanged – roughly once in 27 months for the period 1901-94, with the death rate increasing to 27 percent for the latter half of the period as against 18 for the earlier

half. It is just for this reason that the gradual improvement in the safety record of coal mines has largely gone unnoticed. It has fallen, in terms of the death rate per 1,000 persons from 0.50 in 1973 (the year of nationalization) to 0.32 at present.

The following studies in the extant literature in the Indian context, have addressed the issue. Kejriwal (1994) has discussed the causes of common accidents in coal mines and the measures that should be taken to prevent their occurrence again. Mandal & Sengupta (2000) have described the analysis of fatal accidents of Indian Coal Mines for a period of April 1989 to March 1998, using secondary data. Pathak & Kumar (2001) in their theoretical paper have analyzed the twin mining disasters and opined that human failure and poor management practices often are the reasons for a series of fatal mining disasters. However, there is no empirical study on the topic of causes of accidents in coal mines in the Indian context. Similarly, recent scientific studies probing behavioural aspects in coal mining accidents are few.

The Present Study:

From any point of view, be it economic, social, psychological, or physical accidents constitute one of the greatest problems known to mankind (Tiffin & Mckormick, 1965, as quoted in Korman (1971). The present research endeavour is designed to get insights into the various causes of accidents in coal mines, as perceived by executives working in a coal mining organization.

METHOD:

Sample

The sample consisted 30 executives working in a large coal mining organization situated in eastern part of India that is known for difficult mining conditions.

Sampling Method and Plan

The method of sampling adopted for this study was 'Purposive Sampling', owing to the specific nature of research problem under investigation. The subjects constitute executives who were participants in a five day Management Development Programme at an Institute of National Importance in the eastern part of India. Among these, the executives who voluntarily agreed to participate comprise our sample.

Procedure

The data was collected by 'a dual-moderator focus group interview' (Malhotra, 2001). A focus group is an interview conducted by a trained moderator(s) in a non-structured and natural manner with a small group of respondents. The moderator leads the discussion. The main purpose of focus groups is to gain insights by listening to a group of people from the appropriate target market talk about issues of interest to the researcher. The value of the technique lies in the unexpected findings often obtained from a free-flowing group discussion (for details, one may refer to Malhotra, 2001, Morgan, 1997).

Focus groups are the most important qualitative research procedure. They are so popular that many marketing research practitioners consider this technique synonymous with qualitative research (Garee & Schori, 1997). A focus group generally includes 8 to 12 member (Dachler, 1997; Fern, 1982). A focus group should be synonymous in terms of demographic and socioeconomic characteristics. Commonality among group members avoids interactions and conflicts among group members on side issues (Nelson & Frontczak, 1988). Moreover, the participants should be

carefully screened to meet the certain criteria. The participants must have adequate experience with the object of issue being discussed. It is recommended that at least two groups be conducted (Greenbaum, 1997). A total of four focus groups were conducted as part of this study.

Results and Discussion

The following ideas were generated in the discussion held in the four focus groups that were conducted as part of this study. They are listed in the descending order, as expressed by the respondents of the study:

1. People ignore warning signals due to attitudinal problems.
2. Pressure from superior officers for giving top priority to achieving higher production is also a reason for ignoring warning signals by people working in coal mines.
3. Lack of Safety consciousness among the mining supervisors and the workmen.
4. Lack of proper inspection of mine workings by the relevant mining officials and inspecting authority.
5. Lack of proper training to the workers.
6. Non-adherence to relevant Coal Mine Regulations.
7. Irrational distribution of responsibility and authority

Limitations of the Study

The study suffers from the following limitations: The disadvantages of qualitative research and focus groups are applicable to this study (please refer to Greenbaum, 1997). Apart from this questions may be raised regarding the generalizability of the findings of study, owing to the method of sampling adopted.

Conclusions and Implications for further research

Given the fact that this is a study of professional executives of a coal mining organization, with a relatively small sample, it would be presumptuous on our part to draw any bold generalizations from it. The findings of the study call for further investigation on the topic . It paves way for further research on the concept of 'Causes of Accidents in coal mines'. The findings of the study can serve, as a basis for generating important hypotheses, that may be used for conducting quantitative research. Empirical contribution of the study is that provides empirical evidence with respect to the concept of 'Causes of Accidents in coal mines.. Use of a qualitative method, primarily used in the field of social science, to study a research question of relevance to 'Causes of Accidents', is the methodological contribution of this research endeavour. Applied contribution is envisaged as follows: The findings of the study may aid senior managers of work organizations to get insight into the expectations regarding the concept of 'accidents in coal mines', among executives who work with them. It will help them design strategies and incentive schemes which may have implications for higher safety norms and accident prevention. Future studies may also address the same research questions by conducting a study larger sample involving working executives drawn from organizations. But, all said and done, the study certainly gives insights into behavioural issues involved in coal mining accidents which, hitherto, have not been explored much.

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