

Study on Safety Management System of Manufacturing Industry

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Abstract - Past twenty-five years manufacturing industries have grown dramatically due to high economic development but if we look into safety aspects followed in the manufacturing sector, they are very pathetic, and it becomes threat to the employee's life. So, safety aspects in manufacturing requires huge amount of improvement. Many companies have the policy to reduce the accident rates, but still statistics shows a high rate of accidents and injuries happening in manufacturing sector. Safety management system has various indicator to minimize the accident rates. Organizational safety culture, Behaviour safety, Safety performance are indicators of a safe workplace

Key Words: Manufacturing sector, Organizational safety culture, Behaviour safety, Safety performance.

1. INTRODUCTION

In past twenty years number of industrial accident took place in the manufacturing industries due to lack of environmental safety, unaware of industrial accidents and importance of safety. Most of small and medium level manufacturing industries do not focus on safety because of one-time investment but they don't know about the indirect loss that occur due to accident. Management must focus on their safety improvement. According to Heinrich theory, 88% of industrial accidents were caused by human unsafe behaviour, 10% accidents were caused by the industrial unsafe environment and 2% accidents were attributed to other factors. Nowadays more number of industrial accidents occurs due to the human error.

There are some methods to prevent such an industrial accident and the most effective method is to develop the human behaviour by giving particular training for the work, conducting behavioural based study to reduce the accident rates and to improve the safe environment in industry. From the various studies, we can clearly say that, one of the causes for initiation of industrial accident is poor management system such as policy, safety systems etc. For improving the safety culture and behaviour of the employee, industry needs to provide training, education, meeting, review etc. For this purpose, the industry is in the position to spend money for the following aspects: Training, Education Meeting [1]. Communication also plays a major role in accident because the performance of communication from top level to low level management is very poor. This paper deals with causes of accident and from these causes, we may to find out

solutions and it tends to increase the performance of safety culture, safety performance and behaviour of the employee. Accident statistics in Indian industries in time period of 1988-2008.

Table -1: Number of Workers and Accident Rate per Thousand Worker

Year	No. of workers employed	No. of accident	Accident rate per thousand workers
1988	196156	1214	6.19
1989	233400	1030	4.69
1990	233132	839	3.56
1991	243951	489	2.00
1992	260791	549	2.11
1993	274048	533	1.94
1994	252977	490	1.94
1995	254002	437	1.72
1996	250430	323	1.28
1997	267272	114	0.42
1998	264936	74	0.28
1999	221050	75	0.28
2000	230386	55	0.24
2001	230063	55	0.24
2002	300310	34	1.12
2003	319725	23	0.071
2004	343196	19	0.05
2005	343333	50	0.14
2006	345801	64	0.18
2007	359126	52	0.14
2008	375645	61	0.16

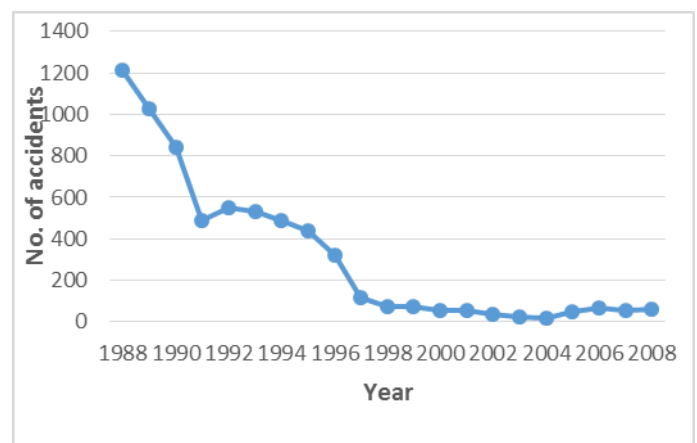


Chart -1: Accident statistics in India from 1988 -2008

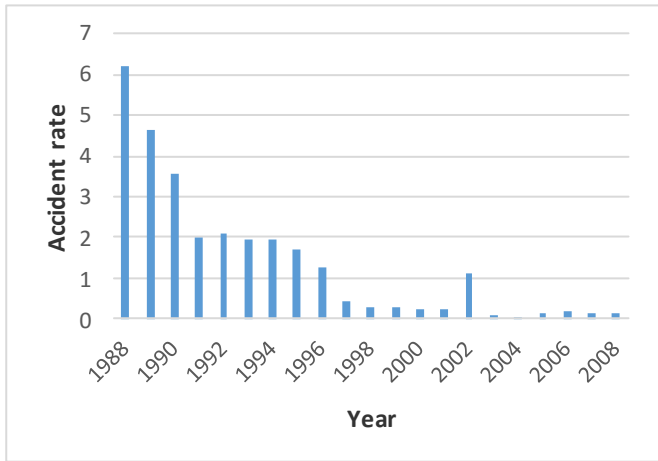


Chart -2: Accident rate in India from 1988 to 2008

2. METHODOLOGY

Safety management system is an approach to reduce the accident rates and improve safety. Some of the key elements of safety management system are safety policy, safety assurance, safety risk management, safety promotion. This paper suggests some systematic approach of safety management system.

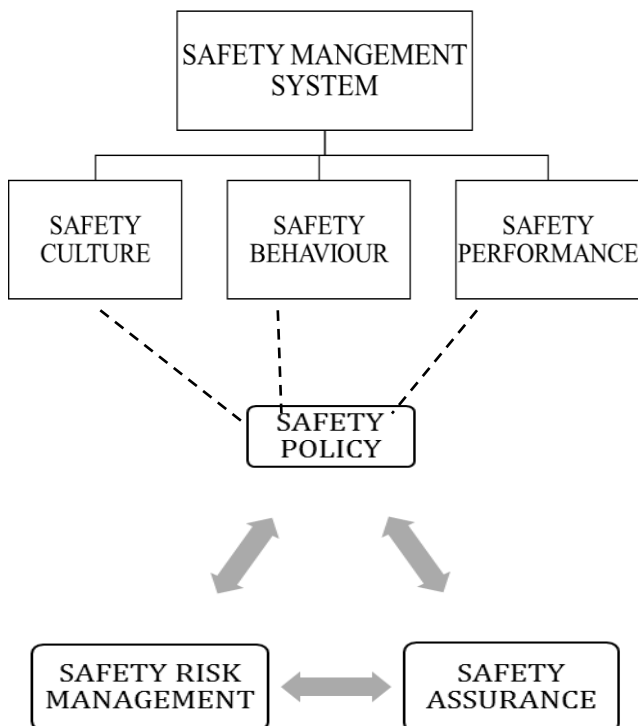


Fig -1: Safety Management System

2.1 ORGANIZATIONAL SAFETY CULTURE

Safety culture plays a key function in determining an organization's success or failure and it's a part of

organizational culture. Organization with poor safety culture which are widespread, routine procedural violations, failure to comply with the company's own safety management system. Various steps have been used to improve the safety culture which are communicating the company values, demonstrate leadership, personalize safety outcomes, develop positive safety attitudes, engage and own safety responsibilities and accountabilities, increase the hazard awareness and preventive behaviors. Various factors in the safety climate terms have been used to measure safety culture: procedure, management commitment, visible management, safety attitudes, workmate's influences, employee's involvement, safety knowledge, management takes the initial work of identifying the hazard at the workplace by using various methods, HIRA (Hazard Identification Risk Assessment), JSA (Job Safety Analysis), work permit system etc. The aim of the management is to eliminate the hazard and minimize their risk at the workplace. Periodic evaluation, review of work at their workplace survey is a must. The main objective of safety culture is to focus on the working environment, welfare facilities and legal requirements. According to the factories Act 1948, Sec.11 suggests cleanliness of work environment, Sec.12 disposal of waste and effluents, Sec.13 ventilation and temperature, Sec.42 washing facilities, Sec.45 first-aid appliances, Sec.46 canteens, Sec.47 shelters, restrooms and lunch rooms, Sec.48 creches and Sec.49 welfare officers, the relationship between the management and workers must be smooth. It improves safety culture in the industries.

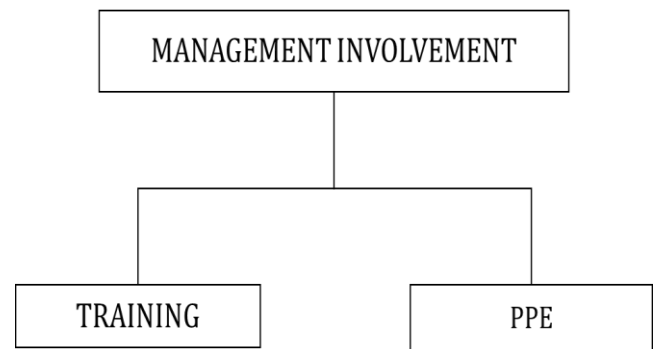


Fig - 2: Factors of Safety Culture

2.2 BEHAVIOURAL SAFETY

In everyday life, it is generally believed that human error can cause injuries and mostly 80-90% of accidents occur due to human error. Factors for human errors are skill-based behaviour, rule-based behaviour, knowledge based behaviour. Safety behaviour is defined as everything a person does in the observable in the working place. The presence of good safety behaviour does reflect good safety compliance. Safety behaviour is more important in manufacturing sector. It is necessary to identify all behaviour activity and then differentiate from the unsafe and safe behaviour. After the respective risk, all behaviour must be made and arranged in order. Safety behaviour describe the support of safety training, motivation and education

activities to be carried out by the employees [2]. There are various methods to prevent the human includes management commitment, organizational commitment, behavioural based study, safety communications, safety motivation, and safety training. Safety training is important to educate employees on potential accidents, how to prevent accidents and how to identify the potential hazards involved in their work. Before the commencement of work new employee must attend the safety training. Behavioural based study is conducted by top management representative. Individual representative has been appointed for the particular work, the representative will observe the routine work of the employee at work place and will note his positive and negative points, representative will discuss the positive points with employee. Safety Motivation is an employer or top management involvement such as relationship with employees, talk on safety and advice on safety matter is related to improve safety motivation and will encourage employees' safety behaviour. There are two types of motivation which is positive reinforcement which gives employees outcomes such as monetary rewards, bonuses and job promotion whereas others are negative reinforcement where employers may criticize, punish and threaten the employees to motivate them to perform their jobs in the safe manners [2]. Safety behavior observation and review is the most important process of correcting the unsafe behaviors in workplace to avoid human error.

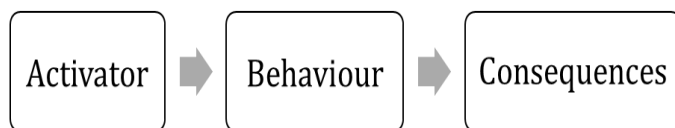


Fig - 3: Behaviour Change Interventions

2.3 SAFETY PERFORMANCE

Periodical maintenance, inspection, audit and review will avoid the chance of creating the hazard. Safety performance will improve the quality; it eliminates all the hazards periodically to reduce the accident rate. There are many parameters that can be used to benchmark safety performance at the workplace. Safety audit, the number of safety training courses conducted, percentage of staff trained in safety, the number of safety inspections and percentage of legal compliance. Two prominent safety performance indicators have been used worldwide for industries, factories and other workplaces. They are frequency rate (FR) and severity rate (SR) [5]. Safety audit is the next concern to the safety system from top level to the low level, it analyses the safety system, points out their error in their particular field and also the best safety improvement condition to the industries. Safety performance is improved by monitoring the employee. Good-quality of monitoring will identify the problems and easy way to identify the solutions. Monitoring takes lot of time and effort; only trained and knowledgeable person are required. Basic types of accident losses are direct losses and indirect losses. Direct losses are material loss,

human loss, compensation. Indirect losses are production loss, property damage, investigation cost, insurance cost.

3. CONCLUSIONS

This paper suggests the need of safety behavior, organizational safety culture and performance. The study has shown that employee's safety is more important and is highly recommended to all manufacturing industries. This will help to improve the safety aspects in all manufacturing industries. By these safety concepts a better safe work environment can be provided to the workers and the productivity will automatically get improved. This study is taken as a ground work to improve safety management on manufacturing industries.

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