Safety Environment in Manufacturing Industry

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Abstract: - **Basically factory is a social system; as group of people works together, gratification and non-gratification of needs has its impact on human behavior. Thus their work life can be motivated by safety needs. But Lack of Safety behavior and safety performance is observed in various industries. For improving the safety culture and behavior of the employee, industry needs to provide training, education, meeting, review etc. This paper deals with safety management awareness amongst shop floor employee, for creating safety lifestyle at workplace, as well as those who are associated with manufacturing industry.**

Key Words: Safety Environment, Safety Management, Unsafe act, unsafe condition, Occupational Health & Safety.

I. INTRODUCTION:

According to "Maslow's hierarchy of needs", human beings tend to satisfy their physiological and safety needs before aiming for social, esteem and growth needs. Inline of this, an individual at a workplace also looks for health and safety first, and its absence can be a serious de-motivator. As per the International Labor Organization's report on the global burden of occupational health illnesses: Of the world's 2.7 billion workers, about 2 million deaths are attributable to occupational diseases and injuries. About 4% of the GDP is lost due to occupational diseases and injuries. Health, Safety and Environment are enablers for economic development.

Management must focus on employee safety improvement program not as a legal compliance but as a prerequisite for work together effectively According to Heinrich theory, 88% of industrial accidents were caused by human unsafe behavior, 10% accidents were caused by the industrial unsafe environment and 2% accidents were attributed to other factors. There are some methods to prevent such an industrial accident and the most effective method is to develop the human behavior by giving particular training for the work, conducting behavioral based study to reduce the accident rates and to improve the safe environment in industry. Also focusing on importance and need of proper safety training program and time to time know the awareness of employees regarding safety environment in manufacturing industry.

Awareness, Education and Training; the biggest worry for emerging economies for a huge working population with low literacy rates and extremely poor awareness of occupational health hazards. To compound this problem is an attitude of acceptance of injuries and accidents as a part of life. This can be even seen on an everyday basis when people recklessly cross yellow lines, layout marked for walking paying scant respect to Dos and Don'ts rules of worksite.

It is imperative to spread awareness of occupational health hazards amongst the huge working population. They need to be sensitized to the long-term detrimental effects of the environment that they work in and what precautions can be taken to mitigate these effects. The awareness is sorely missing even in the employees of industries in the emerging economies. But things cannot only stop at creating awareness. It has to be followed up with training. People also need to be sensitized to the importance of Personal Protective Equipment as a means of first line of defense. OHS awareness should be started at school level to ensure that the future working population is well aware of the occupational hazards and their rights to a safe work environment. Integration of health and safety in all curriculums is essential and this task should be taken up on priority to ensure a safer working environment. But to do all this we need a large trained force of OH professionals. There is an urgent need to have more professional institutes that can impart the training to create a large pool of OHS professionals. This can be achieved through corporate and governmental initiatives.

So in this article we will emphasis on Safety training as a part of safety management system and to know the awareness amongst shop floor employees working in manufacturing industry.

II. REVIEW OF LITERATURE

Cohen (1977);
His study involved examining critical elements that should be part of a successful industrial safety program. According to him, the success of an Industrial Safety Program is best defined by lower injury rates and accidents. He concluded that as far as occupational safety is concerned, strong company commitment to safety, and informal/ formal communication between various levels of a company are the most contributing factors to make a safety program successful.

Zohar (1980);
His focus was on the safety climate of an enterprise. His study concluded that safety climate is related to the general safety level in these organizations and can be regarded as a characteristic of industrial organizations. His study

underlines the importance of safety related issues in manufacturing environments.

Col S Rajeev (2000)
Bundelkhand University, Jhansi has studied the safety requirement in industrial sector for the precaution of accidents which occurs commonly and affects human being such as employer and employee. He has analysis that safety measures has positive contribution in development of industry. He concluded that in India most of industries and factory move into production without incorporate without all safety measures and safety arrangement are not keeping pace with the industrial development.

Alli, 2001;
According to his study, worker participation is one of the most essential aspects of the Occupational health safety management system of the organization.

Gupta (2002) J.P.
According to him the Bhopal Gas tragedy happened due to lack of financial problems, reduction in workers amenities, cost cutting procedure and lack of safety management.

Girish Gundesha (2003)
He has analysis the role and responsibilities of employers, union, management and society. He concluded that precautionary measures must be taken to make the work place safer and should provide proper space to the employers to avoid accidents. According to his study accidents has an impact on overall condition of employer as well as employees.

Beriha, G S et al. (2011)
The authors above conducted a study entitled Safety performance evaluation of Indian organizations. The intention of the research was to create an appropriate standard for benchmarking occupational health and safety performance. The major purpose of their study was to evolve strategies to improve the performance and efficiency of the workers. A major finding in the study was that expenses in safety training were relatively more sensitive for improving safety performance of the organization as compared to expenses in health care.

Geri Shanker et al. (2012);
The authors conducted a study entitled "Assessment of occupational health practices in Indian industries" to review the perception of safety officers on Occupational Health and Safety (OHS) norms extended to the workers from Indian industries. It is quite evident that the study underlines the importance of the workers knowing about their rights and duties.

III.   RESEARCH METHODOLOGY

Research methodology use for this study is survey method and research design is in descriptive in nature. The selection of industrial employee by simple random sampling and sample size was 180 shop floor employees.

Objective of the Study:

1. To understand the safety management at workplace.
2. To know the employees opinion about safety awareness at workplace.

Following steps will explained how the Importance of Safety awareness training to all employees as well as all to all stakeholders who are associated with industry is important.

To achieve zero incidents we need to understand what the Environment Health Safety Targets (EHS) are:-
1. Prevent unsafe Act
2. Eliminate Environment Issue
3. Improve ergonomic Condition
4. Eliminate Unhealthy Condition
5. Eliminate Unsafe Condition

1) Who gets benefited of safety?
    A) Internal Agencies: Owners, Employees, Shareholders, Business holders.
    B) External Agencies Local society members Government authorities visitors/guests Customers, Suppliers
2) Three basic concepts regarding safety:
What is Safety? Freedom and protection from danger hazard or accident. It is positive organized activity based on knowledge of the reaction between human and working environment, which aid business enterprise by minimize human, economic or sociological losses which may get caused by accidents.
What is Hazard? An agent with capability to cause injury and ill health.
What is Risk? Likelihood of hazard causing actual harm.
3) Two types of Incidents:
    A) Accident: An unexpected event that has or could have caused injury or illness. Such an event may also involve damage to property, product or environment
    B) Near Miss: An event which did not result in injuries or illness to people and damage (loss) to assets and the environment, but had the potential to do so and shares the same root causes as an accident.

Eliminating Hazards and Reducing Occupational Safety & Health Risks:-

Table 1. "Hierarchy of Controls"

1.	Elimination (Most effective reliable sustainable)	Eliminate or remove the hazard from workplace
2.	Substitution	Replace with less hazards condition, practice or process
3.	Engineering Solution	Physical change that reduces exposure, isolates worker from hazard.
4.	Administrative controls	Improvements in the way work is done
5.	PPE (Least effective reliable sustainable)	Protect worker with Personal Protective Equipment's

Steps leads to Accidents:
1st Step: Unsafe Behavior/ Act Unsafe Condition
2nd Step: Near Miss Report
3rd Step: Minor
4th Step: Major
5th StepFatal
Unsafe Acts: A faulty work habits and careless working are termed as unsafe acts. An automobile driver in store or in loading and unloading dept. , for ex. Would be said to engage in unsafe acts if he exceeds speed limits, ignores traffic rules, fails to give single while turning, does not maintain safe clearance from the vehicle ahead of him, , overtakes without honking near moving machinery etc. Unsafe acts accounts for the most accidents & injuries.

Table 2.

How to preventing unsafe acts:-	Examples of Unsafe acts:
• Corrective action by supervisor staff.	• Two hand control system bypass.
• Compulsory use of protective equipment.	• Work on live electrical supply, without following LOTO.
• General awareness of bad habits.	• Interlock safety door system bypass

Definition & examples of Unsafe Conditions: - A condition in the Work place that is likely to cause property damage or injury. (List of unsafe conditions)
Bad arrangement of Materials, Unsafe design of equipment, Poor Housekeeping, Unguarded equipment's Lack of safety devices, Slippers Floors, Irregular Steps, Poorly Maintenance equipment, Unsafe Clothing, Unsafe Process.
Way to eliminate Unsafe Conditions:-Though in majority of the accidents the direct cause of accidents is usually the unsafe acts of the persons, but the most effective method of preventing accidents is to remove unsafe conditions
1) Safe guarding of all machines/ equipment's & moving parts.
2) Suitable and safe design & construction.
3) Safe arrangement of materials, processes and methods of work.
4) Suitable safety devices.
5) Adequate and Suitable ventilation.
6) Adequate and sustainable illumination.
7) Proper personal protective equipment's.
8) Good housekeeping.

Table 3. Causes of accidents

Contributing causes of accidents (Are indirect causes of accidents)	causes of accident
• Mental conditions of person	• Violation of procedure/ Rule
• Physical condition of person	• PPE not used
• Supervisory/ management safety performance	• Lack of communication
• Environmental factors	• Bad housekeeping
-	• Improper tools & equipment
-	• Inattention/ Negligence
-	• Poor judgments

Mental condition of the person includes: Improper attitudes, Unfavorable, emotional & mental conditions Lack of concentration to work
Physical condition of the person includes: Extremely fatigues physically handicapped Bad state of health
Supervisory / management safety performance includes- Safety instructions not given –SOPs, MSDS, etc. Safety rules and enforced Hazardous conditions not corrected – structure, equipment's & instrumentations etc. Poor discipline, Emergencies not planned practice
Environmental condition includes: - Insufficient illumination, insufficient ventilation, Extreme temperature, Toxic environment, long working hours, Extreme pressure of work / performance.

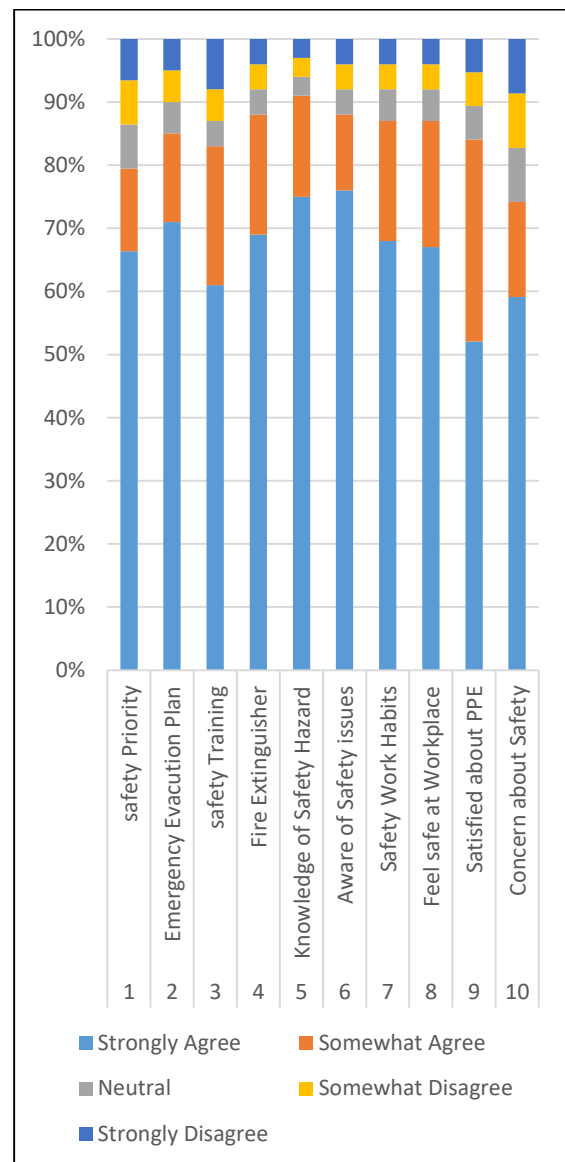IV. DATA ANALYSIS AND INTERPRETATION:

Figure 1:
Employees Opinion: Safety Environment in Manufacturing Industry:-

Total 180 shop floor employees participated in this survey,
1. Self-safety priority- 128 [71%] shop floor employees opinioned that self-safety is first

priority at workplace while 26 [15%] employees were not giving importance to self-safety.

2. Factories emergency evacuation plan- Data shows that 128 [71%] employees are well aware about factory emergency evacuation plan while 20 [17%] were not confident about this plan.

3. Data indicates that there is need of improvement in this area as, out of 180 employees, 109 [61%] agreed that they received training for handling the emergency situations at work place. Rest were somewhat disagree.

4. Data reveals that out of 180 employees, only 124 [64%] employee were aware about the fire extinguishers' locations at the workplace.

5. Identification of safety hazards at workplace is very essential for safety management. Out of 180 employees, 135 [75%] were strongly agree that they know but 44 employees were not aware.

6. Data shows that out of 180 employees, 21 [12%] employees were agree that violation of safety is not taken seriously.

7. 122 [68%] employees are aware about workplace occupational Health and safety policy.

8. Out of 180 employee, 59 [33%] employees were somewhat not feeling safe at workplace.

9. Only 94 [52%] employees were Satisfied about Personal protective Equipment (PPE) provided by company.

10. Only 106 [59%] employee agreed that Concern is shown for health & safety at work.

Findings:

The majority of employees felt that safety is a priority and awareness of factories emergency evacuation plan was good. Most of the employees agreed on training provided by company. Hence they agree to handle emergency situation at work. .Most employees know the location of factories fire extinguisher(s) because, on shop floor, arrangements of fire extinguishers is well in position. On the point regarding knowledge of unsafe conditions, Unsafe Act and safety hazard has to be known according to their opinions. Employees are somewhat aware of safety issues or violations and its effect on their life. Awareness of Occupational Health & safety policy is average. So majority employees felt safe at workplace but satisfaction regarding Personal protective Equipment (PPE) is comparatively not much better than other response. Though concern is shown; for health & safety at work; is an area to be focused and improved upon.

V. CONCLUSION:

OSH knowledge, attitude and skills should be encouraged among employees through proper safety training, when each individual employee will train oneself as well as other employees by sharing knowledge, continuously improving safety management practices, practicing safe activities, safe behavior, then industries can succeed as receiving positive effects on the working environment in terms of quality production, productivity enhancement plus job satisfaction among employees. Employers should use all available resources to learn about their obligations in keeping safe work culture for employee and resolving hazardous situations.

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