A study on effectiveness of Safety & health program on workforce of various manufacturing sectors, Bangalore

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Abstract

The aim of study is to examine the strategic issues pertaining to employee safety and health. Some organizations replace the revoked safety programs with more innovative ones. Some safety programs also have rewards for employees who avoid accidents. The study helps to maintain proper safety standards. It would also help the manufacturing sectors to ensure that employees take protection against unsafe practices.

Every organization should formulate and implement a safety policy. The procedure to be adopted naturally depends upon the size of the company, the number of plants it operates, the nature of the industry in which it is engaged, the production technology it uses, and the attitude of the top management.

After it has spelt out its safety policy, a manufacturing institution should establish a safety program, the primary goals of which should be to reduce the number of hazardous factors that are likely to cause accidents, and to develop safe working habits among its employees.

Hence a realistic & positive view has to be inculcated to ensure the safety & health of workforce in an organisation.

Keywords: Occupational health, Accidents, Employee safety & health, Rewards, Hazardous factors
INTRODUCTION
The role of human resource management within the economy is firstly to integrate the aspects of the economy with the existing processes, policies, and strategies of the organization. The needs of the human resources within the organization need to be re-evaluated, and people must be placed at the heart of corporate purpose. Human resource management has to alert the top management of how important the internet, e-commerce and globalization are for the organization’s success and competitive advantage. Incorporating these means that change will occur. It will be the role of the human resource professionals to act as an interface between top management and the employees during this period of change.

Employees are endowed with skills, knowledge, abilities, values, attitude, aptitude etc. They come to the organization with all these varieties of human resources. Though the job and the organization mostly require employee’s skills and knowledge, it is inevitable to the management to bear and respect the total employee. Then only the employee commits himself to the organization.

The committed employee is a valuable asset to the manufacturing organisation as he contributes his maximum skill and knowledge. Further, the committed employee is loyal to the organisation. In the process of maintaining human relations, the company provides congenial work environment to its employees.

Employee Safety
Safety refers to the absence of accidents. Stated differently, safety refers to the protection of workers from the danger of accidents.

Types of Accidents
Accidents are of different types.

- They may be classified as major and minor ones, depending upon the severity of the injury.
- An accident which ends in a death, or which results in a prolonged disability to the injured is a major one.
- A scratch or a cut that does not seriously disable him/her is a minor accident, but an accident nevertheless.
- A mere incision or a deep scratch may or may not immediately disable the worker, but he or she may develop disability later.
- A worker may be disabled by an injury for an hour, half a day, a day, a week, a month, or a few months.
- If he or she recovers from such a disability, his or her disability is temporary. If the injury is such that he or she will never recover fully, his or her disability is permanent.
Need for safety
An accident free plant enjoys certain benefits.
Major ones are substantial
  ➢ savings in costs,
  ➢ increased productivity,
  ➢ morale,
  ➢ and legal grounds.

HEALTH
WORLD Health Organization has defined health in the following words:

“A state of complete physical, mental, and social well being and not merely the absence of disease or infirmity”.

Employee health refers to “a system of public health and preventive medicine which is prevalent within the industries”.
The following elements are involved in industrial health,
  ➢ Preservation and maintenance of physical health.
  ➢ Preservation and maintenance of mental health.
  ➢ Preservation and maintenance of social well being.
  ➢ Preservation and maintenance of working environment that promotes health.
  ➢ Prevention of working condition causing pollution and health hazard.
  ➢ Protecting workers from risks and other occupational health hazards.
  ➢ Designing work station and equipment to suit individual physique and psychology.

STATUTORY PROVISIONS ON SAFETY
ILO’S CODE
International Labor Organization’s conference in 1948, formulated a model code of Safety Regulations for Industrial establishment. This has become a guideline to most of the countries and their Industrial establishment. Codes cover areas of “unsafe acts”.
Examples are provision of safeguards for running machines, proper maintenance of Industrial tools and equipment etc. ILO’s code is followed by HAL.
Statutory Provisions of Safety in India
a. **Factory Act 1948:** The Sections 21 to 40 cover statutory provisions of safety. Areas covered are the following:
   - Fencing of machinery
   - Precautions in working near running machines
   - Safeguards required for allowing adolescent on dangerous machines.
   - Special conditions in using hoists, lifts, revolving machines.
   - Protection against chemical fuels/gases/dust.
   - File protection equipment.
   - Prohibition of women and children in dangerous areas.
   - Provision of ventilation and lights.

b. **Other legislative measures:**
   - Mines Act 1952
   - Plantation Labor Act 1961
   - Beedi and Cigar Workers Act 1996
   - Contract Labor Act 1970
   - Motor Transport Workers Act 1961, etc.

**SAFETY MANAGEMENT**
Safety management is the process of creating safety guidelines for your organization based on the law and company needs, and then implementing those programs. In order for a safety management system to offer benefits to the company, every level of the management and executive team needs to be involved, according to the Occupational Safety and Health Administration.

**Safety Management Systems (SMS)** is a term used to refer to comprehensive systems designed to manage the safety, health, environmental and general risk aspects of industry. Certain regulatory and enforcement frameworks apply. An SMS is the specific application of quality management to safety.

**INDUSTRIAL HEALTH AND SAFETY**
The disciplines of engineering, epidemiology, toxicology, medicine, psychology, and sociology provide the methods for study and prevention.
Tens of thousands of occupational hazards exist. Occupational hazards can be organized in terms of plants and equipment, the physical work environment, hazards of materials, and task demands. Significant interactions occur between these categories. For example, equipment can modify the work environment by producing noise, potentially hazardous materials, or heat, but will be hazardous only if inappropriate procedures are followed.

Plant hazards are often associated with energy sources and power transmission, processes at the point of operation, vehicles and materials-handling systems, walking and climbing surfaces, ingress-egress, and confined spaces. Hazards in the physical work environment include vibration and noise, thermal extremes, pressure extremes, and ionizing or non-ionizing radiation.

Materials used in industrial processes vary greatly in nature and form. Mists, vapors, gases, liquids, dusts, and fumes from certain materials may be hazardous. Some materials pose fire and explosion hazards. Others are chemically or biologically active when they contact or enter the human body. Even chemically inert materials can cause injuries or illness.

The task performed by a worker can be hazardous. Lifting, pushing, pulling, and other physical activity can cause injury when applied or reactive forces, pressures, or torques exceeds the tolerance of the body. Repeated performance of manual tasks over prolonged periods, excessive reaches, twisting motions, rapid movements, and postures that concentrate forces can significantly increase the risk of injury. Tasks that are stressful or monotonous can also contribute to human error. Changes in work conditions requiring deviations from ordinary routines, such as when equipment is being repaired, are particularly likely to increase the chance of errors.

Failure mode and effects analysis systematically documents the effects of malfunctions on work sheets that list the components of a system, their potential failure modes, the likelihood and effects of each failure, and potential countermeasures. Work safety analysis and human error analysis are related techniques that organize the analysis around tasks rather than system components. This process involves an initial division of tasks into subtasks. For each subtask, potential effects of product malfunctions and human errors are then documented. Fault tree analysis takes an approach that begins with a potential accident and then works down to its fundamental causes. Fundamental causes may be system malfunctions, human errors, or ordinary non-malfunction states. Probabilities are often assigned to the fundamental causes, allowing the probability of accidents to be calculated.

**Methods of controlling or eliminating hazards include plant or process design;**

In the United States, the best-known governmental standards are the general industry standards specified by the Occupational Safety and Health Administration (OSHA). OSHA also specifies standards for the construction, maritime, and agriculture industries. Other standards include those specified by the Environmental Protection Agency (EPA) on disposal and cleanup of hazardous materials, the Federal Aviation Administration (FAA) standards on worker safety in air travel, the Federal Highway
Administration (FHWA) standards regarding commercial motor carriers, the Mine Safety and Health Administration (MSHA) standards for mine workers, the Nuclear Regulatory Commission's and Department of Energy's standards regarding employees working with radioactive materials, and the U.S. Coast Guard standards regarding safety of workers on tank and passenger vessels. State and local governments may also implement safety and health standards.

OCCUPATIONAL HEALTH AND SAFETY

Occupational health and safety is a cross-disciplinary area concerned with protecting the safety, health and welfare of people engaged in work or employment. The goal of all occupational health and safety programs is to foster a safe work environment. As a secondary effect, it may also protect co-workers, family members, employers, customers, suppliers, nearby communities, and other members of the public who are impacted by the workplace environment.

Reasons for Occupational health and safety:

The event of an incident at work (such as legal fees, fines, compensatory damages, investigation time, lost production, lost goodwill from the workforce, from customers and from the wider community).

Safety training classes help establish a safety culture in which employees themselves help promote proper safety procedures while on the job. It is important that new employees be properly trained and embraces the importance of workplace safety, as it is easy for seasoned workers to negatively influence the new hires. That negative influence however, can be purged with the establishment of new, hands-on, innovative effective safety training which will ultimately lead to an effective safety culture.

OBJECTIVES OF THE STUDY

1. To examine the strategic issues were pertaining to employee safety and health in various manufacturing organizations.
2. To analyse the measures taken towards industrial safety.
3. To evaluate the cause of accidents.
4. To suggest the various measures reduce the occupational hazards in a manufacturing concerns.

REVIEW OF LITERATURE

OSH 2016 India provided tangible solutions to a very pressing need in today’s workplace. The International Labour Organisation (ILO) and the World Health
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Organisation (WHO) have came up with different objectives for the subject of Occupational Safety Hazard such as the maintenance and promotion of workers’ health and working capacity; the improvement of working environment and work to become conducive to safety and health and the development of work organizations and working cultures in a direction which supports health and safety at work. These promote a positive social climate, smooth operation and will enhance productivity.

In studying individual personality traits, Clarke and Robertson (2005, 371) found that whilst extraversion was a valid predictor of traffic accidents they could not identify a strong association between personality dimensions and occupational accidents, suggesting the need for further research on the relationship between personality and safety climate.

According to Frick and Wren (2000: 19), systematic OHS management ‘aims to identify sources of injury and ill-health early in the production process and to produce countermeasures before injury or ill health occurs’.

SOURCES OF DATA

Primary Data:
The primary data from the employees was collected through structured questionnaires to understand their perception about Employee Health and Safety program in their manufacturing concerns.

Secondary Data:
Secondary data that were important for the study was collected from journals & reference books.

SAMPLE DESIGN:

Universe of the Study: Employees of manufacturing concerns
Sample Size : 100

The type of research is selected based on the problem identified. Here the research type used is “Descriptive research”. Descriptive research includes surveys and fact-finding enquires of different kinds. The major purpose of descriptive research is description of the state of affairs, as it exists at present. Here an attempt has been made to discover various causes of the problem and to give suggestions for it.
METHOD OF SAMPLING
Sampling is simply the process of learning about the population on the basis of sample drawn from it. Here as sampling technique is used, instead of every part of the universe only a part of the universe is studied and the conclusions are drawn on that basis for entire universe.

TOOLS AND TECHNIQUES OF DATA COLLECTION
Questionnaire was the instrument used for the research purpose.
The instrument used to collect data from primary source is a structured questionnaire that consists of number of questions printed in a particular form. The questionnaire was administered individually.

TOOLS FOR ANALYSIS
After the completion of fieldwork sample units were coded, transcribed and tables were prepared. Appropriate simple statistical techniques like percentage and graphs were used for analysis and interpretation of data.

LIMITATIONS
1. Respondents might not disclose their honest and true opinion.
2. Manufacturing concerns are located throughout India and it is extremely difficult to conduct the study in all over India.

TABLE SHOWING WHETHER THE ORGANIZATION HAS AN ACTIVE SAFETY COMMITTEE

<table>
<thead>
<tr>
<th>Response</th>
<th>No. of Respondents</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>100</td>
<td>100%</td>
</tr>
<tr>
<td>No</td>
<td>0</td>
<td>0%</td>
</tr>
<tr>
<td>Total</td>
<td>100</td>
<td>100%</td>
</tr>
</tbody>
</table>

ANALYSIS & INFERENCE:
From the above table, it shows that the organization has an active safety committee. 100% of the respondents agree to the fact that the organization has an active safety committee. Since all the employees are aware of the safety committee, this shows that the manufacturing concerns has taken perfect measures to ensure that every
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employee is covered under the committee. Timely periodical changes have to be updated by the safety committee.

**TABLE SHOWING THE EMPLOYEES AWARENESS OF THE SAFETY PROGRAMS PROVIDED BY THE MANUFACTURING CONCERNS**

<table>
<thead>
<tr>
<th>Response</th>
<th>No. of Respondents</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>88</td>
<td>88%</td>
</tr>
<tr>
<td>No</td>
<td>12</td>
<td>12%</td>
</tr>
<tr>
<td>Total</td>
<td>100</td>
<td>100%</td>
</tr>
</tbody>
</table>

**ANALYSIS & INFERENCE:**
It is clear that the employees are aware of the safety programs provided by the manufacturing concerns.

**TABLE SHOWING THE MONITORING OF THE VIOLATION OF THE SAFETY RULE**

<table>
<thead>
<tr>
<th>Response</th>
<th>No. of Respondents</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Consultation of the Superiors</td>
<td>32</td>
<td>32%</td>
</tr>
<tr>
<td>Occurrence of Damage</td>
<td>20</td>
<td>20%</td>
</tr>
<tr>
<td>Through Observation</td>
<td>48</td>
<td>48%</td>
</tr>
<tr>
<td>Total</td>
<td>100</td>
<td>100%</td>
</tr>
</tbody>
</table>

**ANALYSIS & INFERENCE:**
From the above, it shows the monitoring of the violation of the safety rule by the safety manager. From the table it is seen that 48% of the respondents feel that the monitoring is done through observation, 32% of them feel it is done through the consultation of the superiors and 20% feel that it is done only during the occurrence of damage.
TABLE SHOWING THE MEASURES TAKEN TO ENSURE INDUSTRIAL SAFETY IN THE ORGANIZATION

<table>
<thead>
<tr>
<th>Response</th>
<th>No. of Respondents</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Safety Committee</td>
<td>28</td>
<td>28%</td>
</tr>
<tr>
<td>Safety Training</td>
<td>56</td>
<td>56%</td>
</tr>
<tr>
<td>Regular Inspection</td>
<td>16</td>
<td>16%</td>
</tr>
<tr>
<td>Total</td>
<td>100</td>
<td>100%</td>
</tr>
</tbody>
</table>

ANALYSIS & INFERENCE:
It is clear that the measures taken to ensure industrial safety in the organization. From the table it is seen that 56% of the respondents have opted safety training, 28% of them have opted safety committee and 16% have opted for regular inspection.

TABLE SHOWING THE CAUSE FOR INDUSTRIAL ACCIDENTS

<table>
<thead>
<tr>
<th>Response</th>
<th>No. of Respondents</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Slip / fall</td>
<td>20</td>
<td>20%</td>
</tr>
<tr>
<td>Inherent Hazards</td>
<td>56</td>
<td>56%</td>
</tr>
<tr>
<td>Collision</td>
<td>24</td>
<td>24%</td>
</tr>
<tr>
<td>Total</td>
<td>100</td>
<td>100%</td>
</tr>
</tbody>
</table>

ANALYSIS:
From the table it is clear that 56% of the respondents perceive that it is due inherent hazards, 24% of them perceive that it is due to collision and 20% perceive that it is due to slip/fall of the employees.
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GRAPH SHOWING THE CAUSE FOR INDUSTRIAL ACCIDENTS

INFERENCe: From the graph it can be inferred that the majority of the respondents perceive the cause being due to inherent hazards.

TABLE SHOWING THE PROVISION FOR HEALTH PROTECTION

<table>
<thead>
<tr>
<th>Response</th>
<th>No. of Respondents</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Accident Insurance</td>
<td>0</td>
<td>0%</td>
</tr>
<tr>
<td>Health Insurance</td>
<td>16</td>
<td>16%</td>
</tr>
<tr>
<td>Hospitalization</td>
<td>84</td>
<td>84%</td>
</tr>
<tr>
<td>Total</td>
<td>100</td>
<td>100%</td>
</tr>
</tbody>
</table>

ANALYSIS:

From the above table it shows the provision for health protection. From the table it is seen that 84% of them have been provided with hospitalization benefit, 16% of them have been provided with health insurance and none of the respondents have been provided with accident insurance.
GRAPH SHOWING THE PROVISION FOR HEALTH PROTECTION

INFERENCES:

From the graph, it is inferred that the majority of the respondents have been provided with hospitalization benefit. This measure is sufficient since the major manufacturing concerns run a hospital catering to the needs of employees at all levels.

FINDINGS

- All the employees are aware of the safety committee, this shows that the organization has taken perfect measures to ensure that every employee is covered under the committee.

- Majority of the respondents have rated the safety policies and procedures to be good. This is useful for the organization so as to increase the average ratings into better ones by frequently updating the policies when change is necessary.

- 20% feel that monitoring is done only during the occurrence of damage. Measures have to be introduced to avoid violation of safety rules.

- Majority have responded that safety training is the measure taken to ensure industrial safety. However, the officials can ensure that regular inspection is conducted along with the safety training.

- Majority of them have agreed that the safety and health training program is conducted. It means that the employees are given due importance with respect to their safety and health.
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- All the respondents agree that medical benefit for occupational disease is provided. This is a good indicator for the safety and health department in the manufacturing concerns.

CONCLUSION
The study concluded that, in manufacturing industry especially, Bangalore both the public and private sectors are functioning effectively towards safety and health on workforce. Discussing best practices, asking questions, and learning from each other will help improve safety and prevent loss of life.

REFERENCES
[1] OSH India 2016: Transforming India’s Workplace Safety And Health
[6] Clarke and Robertson (2005, 371) predictor of traffic accidents they could not identify a strong association between personality dimensions and occupational accidents 32:305-312