

Accident Prevention/ Minimization techniques by Elimination of Unsafe Condition or Unsafe Behavior

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Abstract—Many industrial sectors require large number of machines, equipment and plant facilities, ranging from inbuilt technology to sophisticated modern technologies for their manufacturing process. Man – Machine interaction is generally high in all manufacturing industries. When they move towards the concept of lean manufacturing, obviously, it can have increased number of occupational health hazards and risks to the working group. The main objective of this paper is to minimize and prevent the accidents in all areas by eliminating workplace hazards and unsafe work practices in shop floor and to create a safe & good working environment. Many industries are using the concept of elimination or prevention injuries through the implementation of proactive measures and reactive measures. So it will help to achieve our targets.

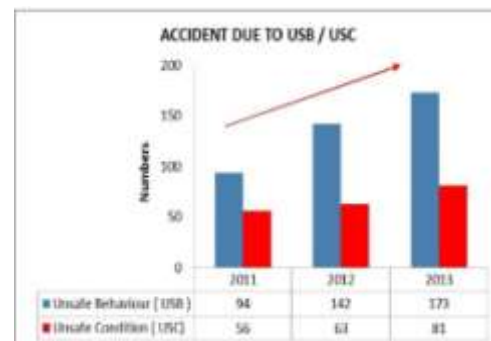
Index Terms—incident, accident, unsafe condition and unsafe behavior

INTRODUCTION TO ACCIDENT PREVENTION/ MINIMIZATION

"Prevention is better than a cure" is an old and popular proverb, meaning it is better to stop before bad things happening than to fix them after they have already happened. Accidents are preventable; steps must be taken to prevent them and to achieve the objectives. It is a legal obligation of the organizations to comply with the laws, standard practices, and safety observations to avoid accidents. Many accidents even lead to loss of life or permanent disabilities that affect the future of personnel. In order to ensure safety of personnel in the work environment we as a safety personnel need to work towards providing a safe environment. During the

past three years many accidents occurred due to human factors. These factors include unsafe acts, un-mindfulness, negligence, lack of knowledge and training. Another leading factor of accidents is working conditions. Unsafe working conditions can include faulty machines, Design factors, substandard process, occupational ill health, fire and other hazards etc., in the shop floor.

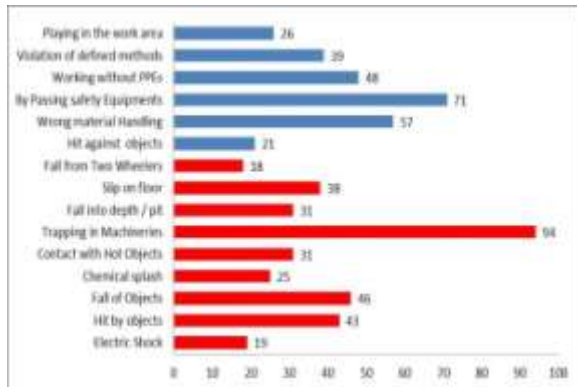
II. CURRENT DATA - REACTIVE MODEL SYSTEM



III.IMPORTANCE OF THE ACCIDENT PREVENTION/ MINIMIZATION

- Reduce accidents & injuries
- Reduce Frequency and severity rate of the company overall safety performance
- Increase safety culture among company employees
- Create Good reputation for company and achieve best bench marking between other industries
- Reduce absenteeism due to the accident
- Productivity improvement with help of safe working environment

IV. PHENOMENON WISE BREAKUP 2011-2013



V. ANALYSIS OF THE DATA

The problems are analyzed by using tools like,
1) QC Problem solving techniques- Why analysis
2) Cause and Effect Diagram



A. Action

- The management has to provide safety equipments like safety guard, sensor, two hand push button and

emergencyswitches to avoid machine related injuries.

- Before installing the machine the operators has to check all the safety equipment is found working or not.

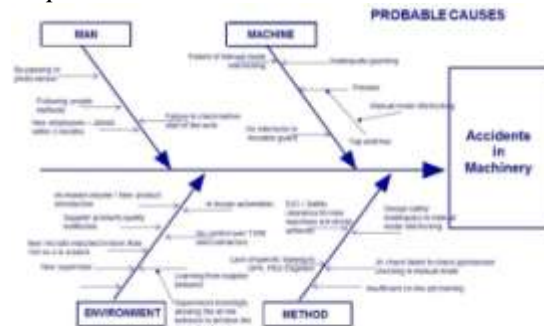
B. Causes and Effect diagram

A cause and effect diagram is “a fish-bone diagram that presents a systematic representation of the relationship between the effect (result) and affecting factors (causes)”.

Step 1:



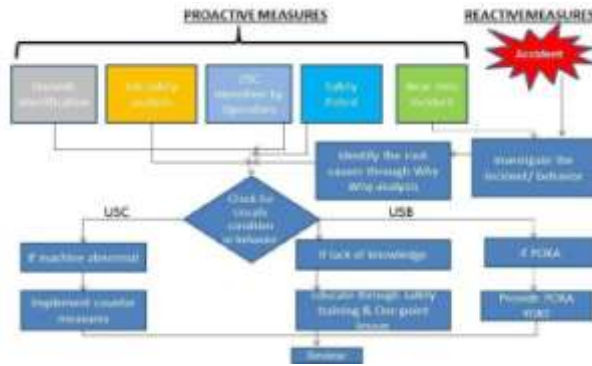
Step 2:



VI.RECOMMENDATIONS:

The first step based on the analysis the main causes of the accident is trapping in machineries. So we focus to eliminate the unsafe conditions in the overall areas and especially in machineries.

VII.PROPOSED MODEL (IMPLEMENTED ON TRIAL BASIS):



VII. PROACTIVE MEASURES

- Safety audit
- Job safety analysis
- Safety Committee meeting
- Incident reporting
- Behavior based safety system
- Safety gallery
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IX. SUGGESTED SCHEME FOR IMPLEMENTATION

- Frequent safety inspection to be planned and inspected the safety device to sustain the continual improvements
- Continuous Behavior monitoring system to be followed to achieve Zero At risk behavior in the workplace
- New Machineries installation procedure to be established and implement necessary the safety
- Involve safety committee member to audit the employee's behavior on work place
- Do the Job safety analysis for all jobs
- Employee's motivation is very important to initial adoption of safety culture. So conduct safety motivational program like safety quiz, slogan competition in National safety day celebration on Every Year March 4th.
- Work permit systems have to be implemented for all service contractors jobs.
- Conduct Periodic Safety Opinion surveys to implement employees suggestions

X. RESULTS

The project result is compared to previous year trend and now the trend is getting down due to the elimination of unsafe conditions and behaviors.

$$\text{Frequency Rate} = \frac{\text{Total No. Of Reportable Accidents} \times 10^6}{\text{Total Man-hours worked}}$$

$$\text{Severity Rate} = \frac{\text{Total No. Of Man-days lost due to Reportable Accidents} \times 10^6}{\text{Total Man-hours worked}}$$

Reportable Accident – Operator not able to return back to duty within 48 hrs from the time of accident.

Man-days Lost - Number of days the operator not able to come for duty from the day of accident.

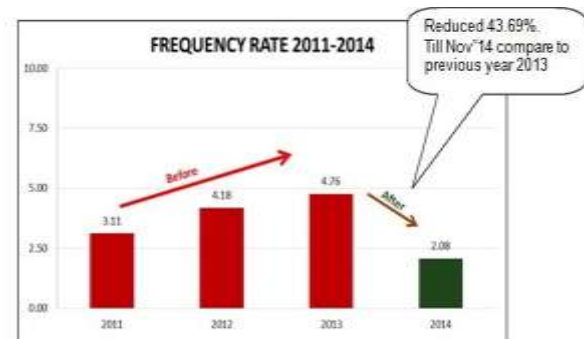
$$\text{Man-Hours Worked} = (A + BA - CA)$$

A = (8 hrs) x (No. of working days) x (Total no. of employees).

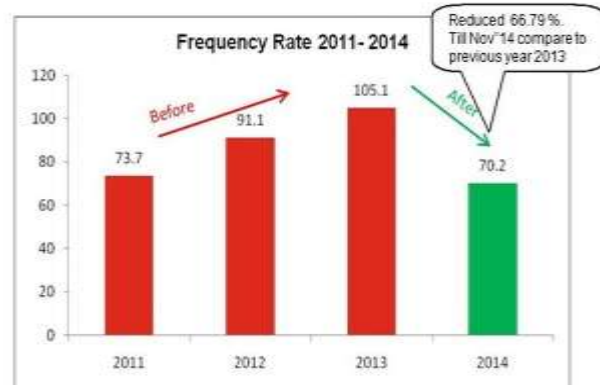
B = Percentage of Over Time.

C = Percentage of Absenteeism

I. FREQUENCY RATES

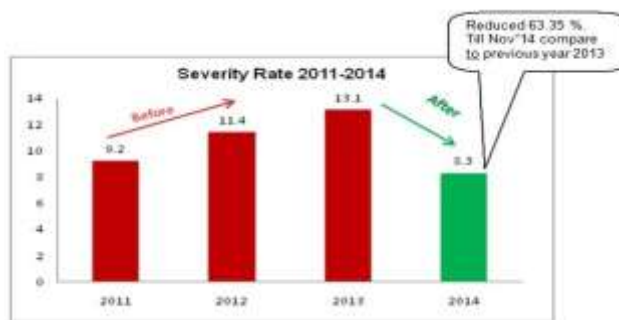


Major Accident(Reportable)

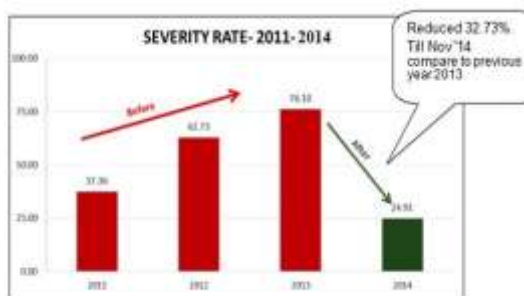


First Aid cases

2. SEVERITY RATE

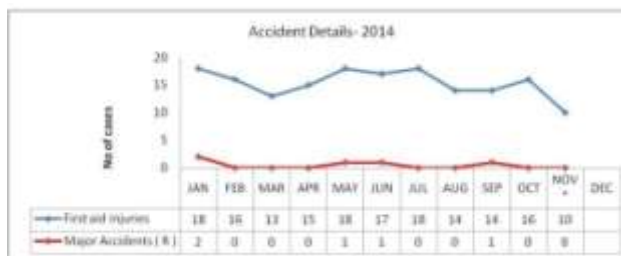


First Aid cases



Major Accident(Reportable)

3. Accident trend for the year – 2014

*Up to November 17th 2014

XI.LIMITATIONS

This system will work only when following safety rules and regulations will become an act of responsibility by the employees. Small negligence can lead to major accident.

XII.CONCLUSION

This paper has resulted in major benefits in terms of accident prevention and minimization by elimination of unsafe condition and behaviors. The above suggestions and implementations will help to achieve

organization goals as Zero Accident". The proactive and reactive measures are not one time implementations. It has to be sustained permanently. A systematic approach to elimination of unsafe conditions and workplace behaviors will result in increase safety standards in organization; Increase employee morale and safety culture and reduce fatigue with good ergonomic design workplace. The major results of this project are to avoid accidents in an organization, Good reputation among Public and private sectors.

XII. FUTURE WORK

We are working to diversify the project by not restricting to automobile industry. Since the cost of implementing is economical it can replace the existing system in every industrial category, making it possible for small scale industries.

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