

Prevention of Incidents Involved with Manual Handling in the Workplace through Hazard Identification and Risk Assessment

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Abstract— The manufacturing industry employs many workers for different types of works involved in daily operations. As the number of people increases the risks associated with the operations also increases because there will be more number of operations and movements of workers. There are many hazards associated with manual handling operations in industry which are to be eliminated or minimized to keep workers from any incident. This paper focuses on evaluation of hazards and risks associated in the workplace and solutions to eliminate the work place hazards.

Keywords— Hazard identification, Risk assessment, Safety Management, Communication, Training

I. INTRODUCTION

Working safely on the site is the fundamental right of every worker. Safety is about what an Organization can do for protecting their workers. Daily they should go out as they came in for duty. The practices of Safety and health are very important to get optimum output, ensure better working conditions for workers and good reputation of the Organization in the Market. In Today's competitive world to meet the demands of the Market, there is push on the workers and machines to increase the productivity within the short time. If the safety management system is not properly implemented and the personnel are not following safe practices then it will end up with less productivity, loss of business. The outcomes of this study form a basic framework that Employers of an Organization can get Safety Management system/procedures that they should implement for their employees So that they can work and live safely within their daily environments and to act in case of an emergency in their workplace. Besides that, safety and health practices will reduce the chances of an accident in the workplace [1]. The basic reason for the most of the accidents caused by employees is just because of lack of awareness. Most of the cases, assigning jobs to untrained people, shortage of skilled labour, Improper maintenance of machinery, Miss communication, taking shortcuts accidents get worse and people end up losing lives. If workers are properly trained, proper precautions are taken, strict laws, rules, and regulations are made, employee awareness programs were held frequently, the number of accidents in their workplace could be controlled. This can be achieved by adopting a Safety Management System.

II. HAZARDS AND RISKS

Risk can have different meanings. For example, risk can be defined as the probability or likelihood that someone will be harmed by a hazard. Occupational Health and Safety Advisory Services (OHSAS) (2008) defined risk as the product of the probability of a hazard resulting in an adverse event multiplied by the severity of the event. Alexander (2000) has further expanded the scope of the term 'risk' by

describing it as not only a hazard but as an unsafe practice, a peril capable of being insured or a

Statistical probability. However, regardless of their contradictions and limitations, most definitions suggest that risk is simply the probability of a hazard happening. In risk management, the term "hazard" is used to mean an event that could cause harm. Hazards are sources of potential harm to human health, property or environment, which may, under certain conditions, lead to accidents. In general, accidents often happen suddenly and unexpectedly causing immediate injuries and losses (OHSAS 18002, 2000; British Standard 8800, 2004). On the other hand, many health problems may also develop slowly over time. Accidents can also be seen to be an organizational problem. Supporting this view, some scholars have looked at accidents as the outcome of unsafe actions, error-provoking conditions, and organizational factors.

A. Methods used in Risk Assessment

- 1) Checklists
- 2) Brainstorming
- 3) Decomposition technique
- 4) Semi-structured interview
- 5) Root-cause analysis

B. Methods used for Hazard Identification

Prevention of accidents is based on risk analysis. According to the empirical findings reported above, it involves the identification of the hazards and the consequences and the likelihood of occurrence of each hazard. Based on these findings, the most preferred method for capturing the nature and degree of risk in industry is the semi-quantitative analysis. Hence, the risk calculator and the semi-quantitative risk rating matrix can be identified as the most preferred methods of risk analysis.

III. ASSESSEMENT OF MANUAL HANDLING

A. Manual Handling

A manual task refers to any activity requiring a person to use any part of their muscular or skeletal system in their interactions with their work environment. It includes the following activities

- 1) Carrying
- 2) Lifting
- 3) Pushing and Pulling
- 4) Striking
- 5) Throwing
- 6) Holding
- 7) Continuous standing or sitting
- 8) Repetitive movements
- 9) Sustained postures

Manual tasks can lead to injury through the development of Musculoskeletal Disorders (MSD). An MSD is an injury affecting the bones or soft tissue structure

(other than organs) of the body that is caused by manual handling at work. Examples include sprains of ligaments; strains of muscles or tendons; injuries to the spine, joints, bones or nerves and abdominal hernias.

B. Symptoms of Musculoskeletal Disorders

- 1) Back or neck pain
- 2) Pain in wrists shoulder or arms
- 3) Stabbing pains in arms or legs
- 4) Painful joints
- 5) Pain, tingling or numbness in hands or feet
- 6) Weakness or clumsiness
- 7) Heaviness
- 8) Burning sensations
- 9) Stiffness
- 10) Swelling

IV. STEPS IN REDUCING MANUAL HANDLING RISKS

Safety management system suggests training employs continuously in order to create awareness among the employee in reducing number of workplace incidents. The four simple steps involved in controlling manual handling risk and hazard are

A. Identify Critical tasks

Some factors in the workplace may increase the risk of an injury occurring. These hazards can be identified in different ways:

- 1) Walk through the workplace and look for potential hazards.
- 2) Talk over risk factors with workers.
- 3) Check through injury records to help pinpoint recurring problems.
- 4) Regularly monitor and update risk identification.

B. Assess the Risk

The next step is to assess which factors are contributing to the risk of injury. Typical risk factors that can increase the risk of injury include:

- 1) type of work – working in a fixed posture for a prolonged period of time
- 2) layout of the workspace – a cramped or poorly designed workspace can force people to assume awkward postures, such as bending or twisting
- 3) weight of an object – a heavy load may be difficult to lift and carry
- 4) location of an object – heavy objects that have to be lifted awkwardly, for example above shoulder height or from below knee level
- 5) duration and frequency – increasing the number of times an object is handled or the length of time for which it is handled
- 6) condition of an object – more effort may be required to manipulate badly designed or poorly maintained equipment
- 7) awkward loads – loads that are difficult to grasp, slippery or an awkward shape
- 8) handling a live person or animal – lifting or restraining a person or animal can cause sprains and other injuries.

C. Implement controls

D. Monitor and review

V. GUIDELINES OF PREVENTING MANUAL HANDLING INCIDENTS

A. Guidelines for weight lifting

The chart below gives guideline weights for lifting and lowering, which assumes that the handling is taking place in reasonable working conditions with a load that is easily grasped with both hands by a reasonably fit, well-trained individual.

No manual handling activity is completely safe. However, using these guidelines as part of a well thought out risk assessment will reduce the risks from manual handling activities. Weights to be lifted may need to be reduced below the guideline values if there are environmental or other factors that could have an adverse effect on the activity or if it involves twisting or bending.

Similarly, if the task is being carried out frequently then weights should be reduced.

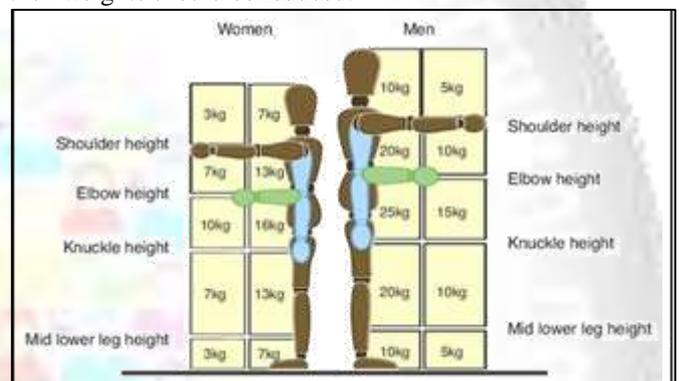


Fig. 1: Guidelines for workplace weight lifting

B. Basic Principles of Manual handling

There are some basic principles that everyone should observe prior to carrying out a manual handling operation:

- 1) ensure that the object is light enough to lift, is stable and unlikely to shift or move
- 2) heavy or awkward loads should be moved using a handling aid
- 3) make sure the route is clear of obstructions
- 4) make sure there is somewhere to put the load down wherever it is to be moved to
- 5) stand as close to the load as possible, and spread your feet to shoulder width
- 6) bend your knees and try and keep the back's natural, upright posture
- 7) grasp the load firmly as close to the body as you can
- 8) use the legs to lift the load in a smooth motion as this offers more leverage reducing the strain on your back
- 9) carry the load close to the body with the elbows tucked into the body
- 10) Avoid twisting the body as much as possible by turning your feet to position yourself with the load.

C. Guidelines for Pushing and pulling

- 1) Avoid / reduce the need for pushing / pulling by using mechanical aids
 - Conveyors (powered or non-powered)

- Powered trucks
 - Lift tables
 - slides or chutes
- 2) *Reduce the force required to push / pull*
- Reduce the weight of the trolley and/or load
 - Provide suitable handles positioned between waist and shoulder height
 - Provide trolleys with suitable wheels / castors (e.g. proper sizing, composition) and ensure that they are regularly lubricated and adequately maintained according to manufacturer's specifications
 - Provide even, but slightly rough, and unbroken floor surfaces which are clean and dry
 - Provide soft sole shoes with good grip
- 3) *Reduce the distance of the push / pull*
- Reposition receiving and storage areas closer to production areas
 - Improve production process to eliminate unnecessary materials handling
- 4) *Optimize handling techniques when pushing / pulling*
- Provide variable handle heights, which are at a suitable distance apart.
 - Ensure low gradient ramps / slopes.
 - Restrict maximum stacking heights to improve visibility, weight and body posture.
 - Provide automatic opening doors.

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VI. CONCLUSION

Workplace injuries are most common type of injuries in Industries especially in manufacturing sectors. As the demand increases, working pressure on workers also increases. If the workers are not trained about their regular duties they may face Musculoskeletal Disorders which are serious issues but we won't come to until the worker tells us. Efforts are taken to present how implementation of a safety Management system can prevent workplace injuries related to manual handling. The implementation Safety management system not only prevents injuries related to manual handling but also enhances an organisation to improve its performance by preventing incidents in the plant which otherwise result in men, machinery and inventory loss. Every organisation must conduct periodic risk assessment for each new job or existing job without fail. These risk assessment are pathways to identify, control and mitigate risks and hazards associated with every work within the organisation's control.

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