

Workplace Safety based on the Hierarchy of Control-A Short Review

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Abstract: Workplace safety is an important issue that need to be taken seriously by all workers at the workplace. It is the responsibility of safety and health management that ultimately rests with the employer to provide a safe work environment for the workers. Hierarchy of control helps in reducing accidents or anything that can possibly happen. This review paper focusing on how the safety at the workplace can be archived based on the control measure that is commonly used in lessening workers with accidents and injuries exposure. Workplace safety can be established by following the hierarchy of control which proposed to reduce risks and hazards at the workplace. In choosing the appropriate control according to the hierarchy of control measure can be able to help employers in control the occurrence of risks and hazards in the workplace.

Keywords: Workplace Safety, Hierarchy of Control, Risk Control, Risks, Hazards

1. Introduction

Workplace safety is a multidisciplinary field dealing with ensuring the health and safety of all workplace stakeholders from hazards and risks related to workplace activities. This also includes the upkeep and protection of all of the organization's assets. Workplace safety somehow describes the approach and emphasis on ensuring the health and safety of employees in the workplace. [2]

Safety in workplaces includes awareness among the employee about the basic safety, hazards in the workplace, risks associated with hazards, hazards mitigation method and the use of safety methods, techniques, processes and safety culture in workplaces and the application of safety measures.

In order to keep a job safe, employers should identify unsafe and dangerous conditions and take the procedures needed to limit their likelihood of occurrences [2]. In order to minimize the likelihood of occurrences, it is important for employers to take an action in implementing risk control to reduce and eliminate hazards or risk at the workplace. Preventive controls ensure protection for workers from

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workplace hazards, aid in the prevention of accidents, illnesses, and incidents, reduce or eliminate safety and health risks, and assist employers in providing safe and healthy working conditions for their employees [2]. Risk controls must be suitable to the hazards posed by an organization's activities and appropriate to manage all hazards [4]. Every industry has its own set of risks, yet there are basic workplace risks across companies [2].

2. Overview of Hazard and Risk

With the aim of creating a safe working environment, employers can protect employees against accident and dangers and safeguard employees by detecting and identifying hazards and risks. The words hazard and risk are often used to each other, but how both of it differ.

2.1 Hazard

Hazard is a workplace environment which can cause harm such as physical injury, work-related disorder or fatality. Hazard identification is used for the identification of all potential conditions in which individuals may be exposed to accident, illness or disease, to the nature and management of injuries or illnesses. It is the first phase of a system for risk management. Three primary groups may separate hazard into hazards for health, safety hazards and environment [3] [1].

2.2 Risk

The likelihood that a person may be harmed or suffer an undesirable health outcome as a result of being exposed to a hazard. It also might apply to circumstances involving the loss of assets or equipment. It is assessed in terms of potential repercussions or chance of occurrence [3]. Risk assessment is a key component of an organization's decision-making process, and the choice must be logically implemented [5]. This entails recognizing the risks, evaluating the likelihood of them occurring, and determining the severity level. Moreover, depending on the assessment results, quantify and access the risk posed and provide risk control strategies. The results and discussion section presents data and analysis of the study. This section can be organized based on the stated objectives, the chronological timeline, different case groupings, different experimental configurations, or any logical order as deemed appropriate [1] [3].

3. Hierarchy of Control

Control is widely used to remove or deactivation of a hazard in such a way that it does not cause a danger who must access a place or work on equipment as part of their regular duties [3]. Implementing risk control measures will ensure that the consequences or possibility of the hazard is reduced, potentially lowering the relative risk. In deciding whether the risk control measure is acceptable; identify the appropriate risk control as defined in regulations, codes of practise, regulator-issued guidance, and industry practice guidelines [1].

3.1 Hierarchy of Control

Hierarchy of control act as a guideline for employers to select the appropriate control that are most effective, feasible and permanent to eliminate hazards and risks at the workplace. These hierarchy of control is the effective way to create a safe work environment and achieve workplace safety.

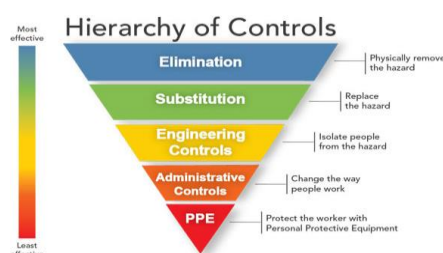


Figure 1: The hierarchy of control by NIOSH

Accordance to the Figure 1, the arrangement of controls has been arranged from the top is the most effective to the least effective control. This hierarchy usually results in the application of significantly safer structures, where the risk of illness or injury is significantly reduced. The use of this hierarchy in risk control measure is the most popular approach in achieving workplace safety [8].

Based on the hierarchy, the most effective control is elimination. Then, substitution, engineering controls, administrative control and the least effective is personal protective equipment (PPE). The control are in a rank order which the most effective should be the priority in implementing control measure.

3.1.1 Elimination

Elimination is the most effective and at the first rank which employers should take it as a priority in implementing control measure. Elimination defined as physically remove the hazard. Elimination is a procedure for removing risk from the workplace or work process. [6][3] In elimination control measure, it entails eliminating or completely removing the risk and any accidents will never occur. Redesign and the job structure or replaced a material to be use with safer material might be necessary as it can eliminate and remove any hazards. With that, there will be no risk and any accidents will never happen towards employees and workplace safety can be improved [1][3].

3.1.2 Substitution

Substitution defined as replaced the hazard. This substitute control measure focusing on the process of replaced or substitute any hazardous substance or material into the materials or substance that is much safer to use or safe to be processes [6] [3]. It means that it will not affect employees when doing their work and make the workplace more safety. This substitution control measure are not fully eliminate or remove the hazards but it could reduce health hazards that might be effect the employees [3].

3.1.3 Engineering Control

Engineering control possessed on isolating people from the hazard. Engineering controls ensure protection by eliminating hazardous conditions or erecting a barrier between the worker and the hazard [9][1]. For example by made any modification on tools or equipment using enclosure, mechanical ventilation, guarding or automated process it can reduce the exposure of risks towards workers [6]. By implementing engineering control, it help workers in preventing them from hazards exposure which might lead to an accidents and injuries at the workplace.

3.1.4 Administrative Control

Administrative control is focusing on changing the way workers work. This control measure is a process of controlling a person who working and faced with risks [3][8]. These control measure required the employer to establish safety culture among the workers such as by providing appropriate education and training, information or instruction that can increase employees' awareness about workplace safety. Other than that, organization should adopting operating procedures or safety practises in overall company also an administrative control measure. In implementing such measure, it can minimise the risks of harm and reduce any health effects towards the worker.

3.1.5 Personal Protective Equipment (PPE)

Personal Protective Equipment (PPE) is mean as wear protective equipment to protect the worker with PPE. PPE is an equipment that reduce the exposure to hazards that can cause occupational injuries and illness. These control measure required workers to wear protective equipment such as glasses, glove, safety foot ware, masks, hard hats and full body suit [3][7]. By wearing protective equipment, it manage to reduce workers from serious injuries and illness which may result from chemical exposure,

radioactive, electrical and other workplace hazards. These control is the least effective control measure in protecting workers and should only be used in combined with other effective control measure or when other control measure are inconvenient to make the workplace more safety.

4. Selecting an Effective Control

In selecting control measure, employers have to determine the control that are most permanent, achievable and effectual. In order to select the effective control in protecting workers safety and health, All major hazards that are causing or are likely to cause death or serious physical harm to workers should be eliminated or controlled by employers. On major dangers and risks, employers should eliminate and pick control measures right away. In selecting control, it is very important to select according to the hierarchy which at the upper rank and the most effective is emphasizes elimination and substitution of the hazards include implementing engineering solutions followed by administrative controls and finally personal protective equipment. In implementing control measure, it is necessary to guarantee that the control measures do not introduce new dangers, either directly or indirectly. When no single risk control is effective in protecting workers, a combination of control measures must be used to improve workplace safety.

5. Conclusion

Workplace safety is important for maintain the safety and health of employees while employees perform work in the workplace. Workplace safety can be improved and maintained when organization implement and take into practical of control measure in reducing risks and hazards which exists in the workplace. Using a hierarchy of control measures in determining the appropriate type of control to remove and prevent any workplace accident and injuries to employees, certainly effective control measures can reduce risk and improve employee safety in the workplace. Thus, these hierarchy of control can be implemented in any workplace as this control measure is focusing in reducing any risks and hazards at workplace.

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