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Developing Accident Avoidance Program for Occupational Safety and Health

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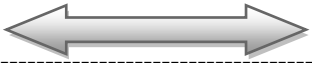
----------ABSTRACT----------

An occupational health and safety programs are effective must demonstrate effective management leadership, worker participation, continual improvement, evaluation, integration, management review in the workplace. Companies with good results in the box has leadership will not allow substandard result. Although cooperation and consensus is important in gaining employee buy - in to the program, ultimately it is the leadership and commitment from management that drives the process. The audit will assess the level of leadership and commitment to health and safety within the organization to evaluate the program. Despite the value to employers and workers in terms of injuries prevented and cost saved, many factories have not yet adopted injury and illness prevention programs that workers safety. Based on the positive experience of employers with existing programs, it believe that injury and illness prevention programs provide the foundation for breakthrough changes in the way employers identify and control hazards, leading to significantly improved overall workplace health and safety environments. Adoption of injury and illness prevention program will result in both improved workers safety and workers suffering fewer injuries, illnesses and fatalities.

KEYWORDS *- Occupational Health and Safety, Injuries and Illness, Workers safety and Hazards.*

Date of Submission: 03 October 2014  Date of Publication: 20 October 2014

I. INTRODUCTION

In today's world, rapid economic development has not only led to significant improvements in incomes and the quality of life, but also resulted in great increases in the number of people killed and injured at work. An "accident" is defined as an unplanned, undesired event that results in personal injury or property damage. Accident in workplace often happen as a result of neglecting the precaution measures in the competitive market where advanced technologies, intensive exploitation of resources, the increasing of natural and technical threats which resulting in lower economic growth rate (M. Spilka, 2010). In Malaysia, workplace-related accidents have continued to rise according to report of Department of Occupational Safety and Health (DOSH). Sectors that involved were manufacturing; mining and quarrying; construction; agriculture; forestry and fisheries; facilities; transportation; storage and communication; wholesaling and retailing; hotels and restaurants; finance, insurance, real estate and services; and civil service.

In 2012, a total 2,824 of accidents were recorded by DOSH, 179 cases were fatal, 205 cases are permanent disability and 2,440 cases are without permanent disability. The numbers of accidents increased by 405 cases compared to 2,419 in year 2011. Accidents in the workplace happen for a number of reasons. The results of a workplace accident can be minimal or tragic, causing minor injury, damage to equipment or even in some cases, major injury or death. According to Occupational Accidents Statistics 2012, the percentages of accidents in manufacturing sector are always higher than other sectors. The manufacturing sector made up the highest number of workplace accidents at 60.91% with 1720 cases, comprising 40 fatal cases, 147 cases permanent disability and without 1533 cases permanent disability.

This paper aims to design the accident avoidance program to improve the safety and health in manufacturing environment. Section 2 describes the methodology used to design the accident program, Section 3 presents the case study and the results conducted in the case study company, Section 4 compares the results from Section 3, Section 5 discussions the results, and Section 6 concludes the paper.

II. FRAMEWORK OF THE ACCIDENT AVOIDANCE PROGRAM

The framework model of the accident avoidance program shows in Figure 1. Stage 1 is data collection about the industrial accident in case study industry. Identify the type of industry and type of accident and injury. Stage 2 is analyzing the data and defines the possible root cause of the accident. Stage 3 is proposing the possible counter measures to avoid occurring accident in the future and stage 4 is develop the accident avoidance program in case study industry.

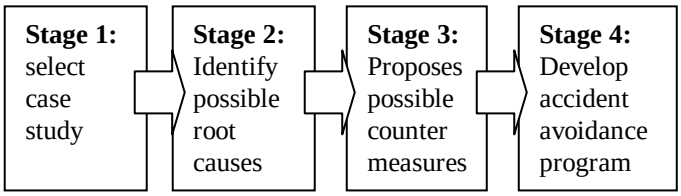


Figure 1: Methodology framework

III. CASE STUDY AND DATA ANALYSIS

A worker at ABC manufacturing company was welding on a sealed and empty metal drum that had previously contained acetone. The welding instrument burned through the surface of the thin metal, igniting the flammable acetone vapour inside the drum. The drum exploded and struck the worker, throwing him across the room onto a concrete floor. The worker sustained fatal injury.

Root cause analysis (RCA) is a systematic technique that focuses on finding the real cause of a problem. To determine the causal factor of an accident, Fishbone Diagram had applied in this fatal case. Hazardous conditions may exist in any of the following categories as a Figure 2.

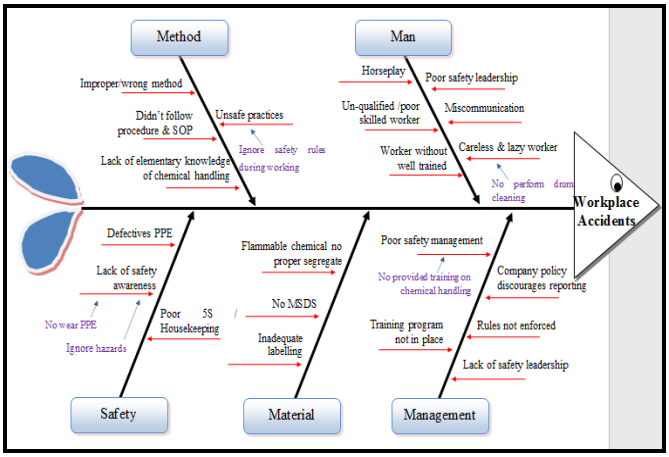


Figure 2: Root cause analysis (RCA)

A. Man or People

Most accidents in the workplace result from human behaviors which is worker, supervisor or manager. It might occurs if the worker horseplay during carry their task. While, carelessness and laziness of worker is another cause of accidents due to they not performed drum cleaning which is contain flammable acetone. Others factor might supervisor or manager lack of safety leadership, they not provide well training on chemical handling and ignore the hazard during pass down and practices. Besides that, miscommunication issue might happen during pass down or training. Worker might carry their task based on their understanding. Additionally, company hired unqualified or poor skilled worker due to cost saving on wages.

B. Method

Method also is one of important factor that have directly caused or contributed in some way to the workplace accident. Workers did not follow the actual working procedure and improper technique or method can caused accidents at work. Most accidents in the workplace result from unsafe work practices which is the worker ignore the safety rules during carrying the task. Others reasons might due to lack of elementary knowledge in working method and chemical handle because of they are not undergo a complete training and instruction session.

C. Management

Management of an organization plays a very importance role on the safety working environment. Management system weaknesses is a major root cause of workplace accident happened. It is included missing or inadequate safety policies or rules, training program not in place, safety policies or rules are not being enforced, safety training is not being conducted, adequate supervision is not conducted and management might lack of safety leadership. For instance, management should provide safety training to new hire employee such as method of using PPE, on job training, and also safety precaution training. Poor leadership and management in the workplace can cause numerous negative consequences for employees

D. Material

Hazardous material found in this accident are flammable chemical (Acetone), empty metal drum that contained acetone and welding instrument. It was suspected that the empty metals drum no segregate and without proper label for identification cause that worker welding on the drum without perform cleaning. Apart from that, the worker might lack of elementary knowledge in chemical properties due to there is no MSDS for the acetone.

E. Safety

In safety point of view, poor 5S or housekeeping and defective Personal Protect Equipment (PPE) might increase the risks of injury. Besides that, worker who lack of safety awareness have always ignore hazards and failing to comply procedure during carrying their task.

IV. METHOD TO AVOID RECURRENCE ACCIDENT

The best way to avoid accidents in the workplace is to be proactive with prevention. An ounce of prevention is worth a pound of cure. Preventing accidents and injuries within the workplace is done by controlling hazards and mitigating risks. One of the challenges is identifying the hazards and risks before it causes an injury or other serious incident. There are many ways to prevent accidents but in implementing these methods, an organization needs to be consistent and communicate their expectations clearly. To successfully avoid accidents in the workplace, review the following list of safety suggestions.

A. Put Formal Safety Policies and Procedures in Place

Create a company handbook that lists out the steps that must take place in order to prevent accidents in the work place. Include procedure and instructions such as welding work instruction, chemical handling method, and hazardous materials identification to alert employers and workers; raise their safety awareness to the dangers of the product.

B. Implement 5S or Good Housekeeping

A well maintained work area sets a standard for all. Poor housekeeping creates all types of hazards and sets the stage for accidents. Good housekeeping encourages pride and a safe environment. Keep the working environment clean and tidy, with floors and access routes kept clear of obstacles.

C. Metal Drum Allocation Area and Segregation

All metal drum must proper allocation and segregation for before cleaning and after cleaning. Metal drum that contained acetone must segregate properly to avoid mixed with metal drum after cleaning. For instance, drum before cleaning must place in area with RED color layout and every drum must label with red color sticker as status indicator. On the others hand, drum after cleaning must place in GREEN layout with green sticker identification. So that, workers can easily to identify the drum condition and can proceed to the next step. This action can avoid recurrence of accident on worker who welding on drum without performed cleaning that may contain acetone.

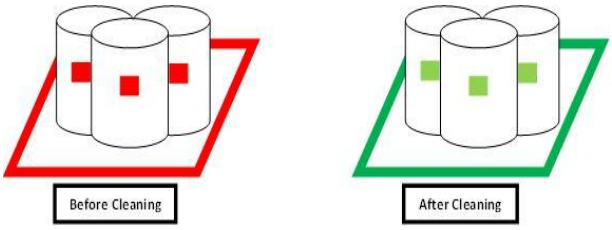


Figure 3: Proper Allocation Area

D. Labels and Material Safety Data Sheets (MSDS)

Labels must be placed on all containers of hazardous materials to alert employers and workers to the dangers of the product and basic safety precautions. For instance, every metal drum can identified with color sticker to segregate drum before cleaning and drum after cleaning. MSDS must be prepared for all hazardous products. These data sheets provide more detailed information about the product than can be put on a label. MSDS should keep at workplace for all workers to refer when they are needed.

E. Workplace Safety Inspection

Supervisors should conduct periodic safety inspections to identify unsafe work practices. For instance, they should be on the lookout for workers who are not wearing appropriate clothing or protective equipment during doing their task; workers performed drum cleaning with unsafe manner; failure to follow established safety policies or warning signs; employees using unsafe welding techniques; unsafe use of equipment and other safety hazards. Supervisors should inspect both indoor and outdoor work areas to avoid overlooking unsafe practices. Once hazards have been identified, managers and employees should work together to eliminate or mitigate them.

F. Worker Education and Training

Employees need to stay alert and aware at all times to avoid accidents, while managers need to know the most common causes for workplace accidents and be able to spot the risk factors early for prevention. So management should provide worker education programs on the hazards of chemicals in the workplace and training in understanding and using the OSHA information. Improve knowledge of chemical handling of worker. The ultimate goal of OSHA is to create a safer workplace by providing workers with the knowledge and tools to enable them to understand the hazards and to work safely.

G. Personnel Protective Equipment (PPE)

Management must provide the training on using appropriate protection clothing and equipment to ensure their worker safety. Personnel Protective Equipment (PPE) greatly reduces the risk of injury and minimizes the effects of toxins. Protective clothing and equipment must be worn during all welding operations. Every worker who performed welding process must wear PPE which are clear face shield, helmet with respirator, leather apron, sleeves, leg apron, coat, glove and cape and rib to protect welders from injury.

V. ACCIDENT PREVENTION PROGRAM

Workplace accidents prevention programs are proactive processes that can substantially reduce the number and severity of workplace injuries and illnesses and can alleviate the associated financial burdens on workplaces. These systematic programs allow employers and workers to collaborate on an ongoing basis to find and fix workplace hazards before workers are hurt or become ill. This kind of programs can provide the foundation for breakthrough changes in the way employers and their workers identify and control hazards, leading to a significantly improved workplace health and safety environment. Adoption of a workplace accident prevention program will result in workers suffering fewer injuries, illnesses and fatalities. In addition, employers will improve their compliance with existing standards and experience the financial benefits of a safer and healthier workplace. There are few steps to develop a good accident prevention program, it is include develop management leadership and commitment, worker participation, hazard identification and assessment, hazard prevention and control, education and training and program evaluation and improvement.

A. Step 1-Management Leadership and Commitment

Management leadership and commitment is crucial to the success of the workplace accident program. Management must not only establish the program and communicate it to everyone in the organization, but also provide the resources to improve safety and health throughout the entire organization. This includes providing employees and supervisors with the authority to identify and correct hazards, the budget to purchase new equipment or make repairs, the training necessary to work safely and to recognize hazards, and the systems to get repairs made, materials ordered and other improvements accomplished. Management also establishes the importance of the accident prevention program, both by the priority they give workplace safety and health issues and by the example they set by initiating safety and health improvements, correcting hazards, enforcing safety rules, rewarding excellent performance in safety and health, and by following all safety rules.

B. Step 2-Worker Participation

Worker participation is a fundamental element of workplace accident programs, makes an important contribution to an employer's bottom line. When workers are encouraged to offer their ideas and they see their contributions being taken seriously, they tend to be more satisfied and more productive (Huang et al., 2006).Engaging employees in dialogue with management and each other about safety and health can lead to improved relationships and better overall communication, along with reduced injury rates. Improved employee morale and satisfaction translates to greater loyalty, lower absenteeism and higher productivity. For instance, management can involve all employees in policy making on safety and health issues while manager consult with workers in developing and implementing the program and involve them in updating and evaluating the program. Some more include workers in workplace inspections and incident investigations. Besides that, management must always encourage workers to report concerns, such as hazards, injuries, illnesses and near misses. Additionally, protect the rights of workers who participate in the program also is responsibility of management.

C. Step 3-Hazard Identification and Assessment

Identify, assess and document workplace hazards by soliciting input from workers, inspecting the workplace and reviewing available information on hazards. Then perform investigate injuries and illnesses to identify hazards that may have caused them. Another importance step is about the methods of organization plans to use to identify, analyze and control workplace hazards. This includes hazards that currently exist in the workplace and those that may occur due to future changes, such as the introduction of new equipment, processes or materials, or the revision of existing procedures. There are several methods organizations can use to identify hazards. Inspection of work areas and audits of safety programs are tools that can be used to identify problems and hazards before these conditions result in accidents or injuries. Audits also help to identify the effectiveness of safety program management can be used as a guide to assure regulatory compliance and a safe workplace. Some rely solely on walk around inspections by first-line supervisors, management or safety committees, others go through formal hazard analyses of different parts of the operation and some use a combination of methods. Regardless of the methods used, the best hazard identification methods combine expert opinion about safety and health hazards with input from either a cross-disciplinary team or at least one employee who works directly with the process or equipment in question. At least some of the individuals involved in hazard identification should be trained in hazard recognition. Inspections should be done on a regular basis to identify both newly developed hazards and those previously missed. Employers should also consider the value of periodic industrial hygiene monitoring and sampling for agents such as hazardous substances, noise and heat. For instance, one of the more common tools used for hazard identification are checklists. Another method often used to identify workplace hazards is job hazard analysis (JHA), also known as job safety analysis. Job hazard analysis is a step-by-step method of identifying the hazards associated with a particular task or job. It is important to involve the employee who normally performs the job, in the development of the JHA.

D. Step 4-Hazard Prevention and Control

Management should establish and implement a plan to prioritize and control hazards identified in the workplace and provide interim controls to protect workers from any hazards that cannot be controlled immediately. Then verify that all control measures are implemented and are effective. For instance, management must maintain equipment and tools regularly and thoroughly. Besides that, ensure that employees know how to use and maintain personal protective equipment (PPE) and train employees in proper procedures for handling specific situations

E. Step 5-ducation and Training

An employer is also obligated to provide "to employees, in appropriate languages, the information, instruction, training and supervision necessary to enable them to perform their work in a manner that is safe and without risk to their health. For instance, provide education and training to workers in a language and vocabulary they can understand to ensure that they know about procedures for reporting injuries, illnesses and safety and health concerns, method on how to recognize hazards, correct ways to eliminate, control or reduce hazards and management must conduct refresher education and training programs periodically to raise their awareness. Establish appropriate education and training programs for staff, which may include a structured training regime for employees, encompassing on job training, refresher training and OSH Consultation training.

F. Step 6-Program Evaluation and Improvement

Lastly, management should conduct a periodic review at least annually of the program to determine if it has been implemented as designed and is making progress towards achieving its goals. Program review is vital, because it serves as a check to see if the organization is making progress toward its goal of creating a safer, healthier workplace for all employees. The second reason for conducting a review or audit of the workplace safety and health program is to determine whether the procedures used in the facility are consistent with those described in the program and if they are effective. For example, if the audit shows there are injuries and illnesses occurring from hazards that have not been identified or controlled through the methods described in the safety and health program, the auditor needs to determine if the methods are being used in the facility correctly and as described in the program. If the methods are not being used or are used incorrectly, the auditor needs to determine what barriers are present that prevent the correct application of the methods. If the hazard identification and control techniques are being applied correctly, then the organization needs to further review the techniques and, perhaps, modify them or adopt new ones.

VI. CONCLUSION

As a conclusion, workplace accidents have great increases in the number of people killed and injured at work while the manufacturing sector made up the highest number of workplace accidents. Most everyone would agree that an accident is unplanned and unwanted. An accident might causes property damage, or personal injury, minor or serious and occasionally results in a fatality. Hazardous conditions may exist in man or people, method, management, material and safety. To seek to minimize the pain and suffering, equipment damage, loss of morale. Root cause analysis is needed to determine the causal factor. The best way to avoid accidents in the workplace is to be proactive with prevention. An ounce of prevention is worth a pound of cure. Workplace accidents prevention programs are an effective tool for reducing occupational injuries, illnesses and fatalities. There are few steps to develop a good accident prevention program, it is include develop management leadership and commitment, worker participation, hazard identification and assessment, hazard prevention and control, education and training and program evaluation and improvement. Preventing accidents and injuries within the workplace is done by controlling hazards and mitigating risks. One of the challenges is identifying the hazards and risks before it causes an injury or other serious incident. Preventing accidents and injuries within the workplace is done by controlling hazards and mitigating risks. One of the challenges is identifying the hazards and risks before it causes an injury or other serious incident. If an accident does occur, conducting a thorough analysis of the causes will help prevent future accidents from occurring. Additionally, safety precaution and management responsibilities influence the safety climate. It is important for employer, employee and also government to co-operate hand in hand to ensure a minimum danger risk level at the workplace. Government need to enforce the law of Safety and Health to make sure all the industries follow the guidelines of safe work culture. Time by time, government also need to carry out some campaigns or workshops to increase people awareness on safe work culture and the necessary to follow the rules and regulations. Employees need to stay alert and aware at all times to avoid accidents, while managers need to know the most common causes for workplace accidents and be able to spot the risk factors early for prevention.

APPENDIX

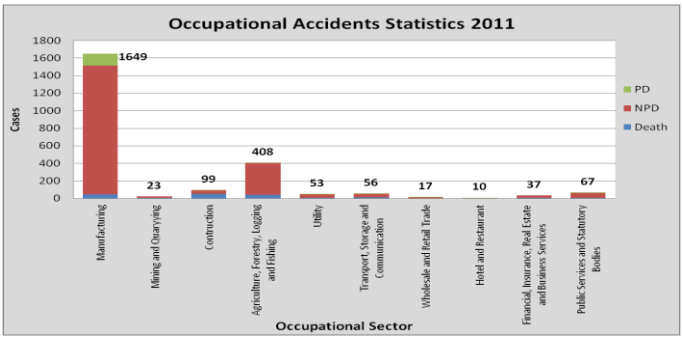


Figure 4: Occupational Accidents Statistic 2011

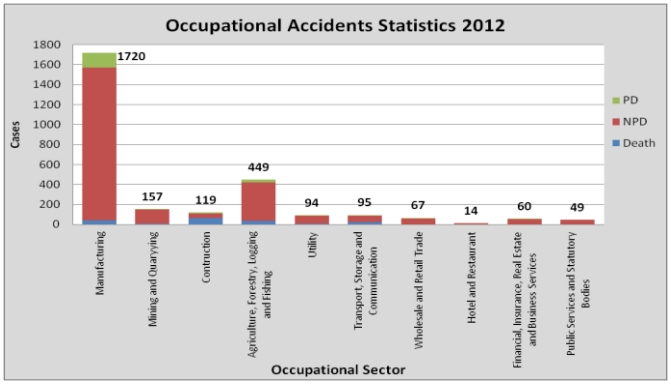


Figure 5: Occupational Accidents Statistic 2012

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