Job safety and awareness analysis of safety implementation among electrical workers in airport service company

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Abstract. Electrical is a fundamental process in the company that has high risk and responsibility especially in public service company such as an airport. Hence, the company that operates activities in the airport has to identify and control the safety activities of workers. On the safety implementation, the lack of workers' awareness is fundamental aspects to the safety failure. Therefore, this study aimed to analyse the safety awareness and identify risk in the electrical workplace. Safety awareness questionnaires are distributed to ten workers in order to analyse their awareness. Job safety analysis method used to identify the risk in the electrical workplace. The preliminary study stated that workers were not aware of personal protective equipment usage so that the awareness and behavioural need to be analysed. The result is the hazard was found such as electrical shock and noise for various intensity in the workplace. While electrical workers were aware of safety implementation but less of safety behaviour. Furthermore, the recommendation can be implemented are the implementation of behaviour-based safety (BBS), 5S implementation and accident report list.

1 Introduction

Occupational safety and health is an important concern for all working individuals [1]. In lack condition of information and awareness of occupational safety in the workplace would like to tend accident in the workplace. Among the main contributing factors that influenced in occupational safety and health implementation to unintentional occupational injuries identified by World Health Organization [2] are poor worker-employer collaborative mechanism, poor training and lack of knowledge, and lack of incentive-based compensation system. Each of these contributing factors falls within the traditional purview of psychological or behavioural of workers among safety system. Therefore, the safe design and safe of use of instruments or tool are broad subjects that involve nearly all procedures in order to do the work [3].

These kinds of procedure were involved all of work such as in operating, machine, production, inspection, etc. Safety consideration must be applied in all of workplaces in order to minimize the assurance cost and worker's accident especially in special type of workplace such as mechanical, electrical, chemical workplace, etc. Over the last few years, there has been tremendous attention given to the arc flash hazard phenomenon. Even though this hazard needs attention to reduce the number of injuries occurring because of it, in some ways, it has become the predominate focus of electrical safety [4]. Electrical safety is more than just the arc flash hazard. Electrical safety needs to be a holistic approach that includes all aspects of electrical safety.

Moreover, even there are routine inspection that has already done by safety health and environment section, the electrical workers are not concern in the safety workplace and their procedure that based on the observation conducted. The electrical workers were not followed the regulation in personal protective Equipment (PPE) usage and avoiding the inspection. These acts of workers that ignoring the safety regulation especially in safety procedures can be caused by several factors such as lack of training or lack of knowledge so that the awareness among safety in the workplace and job procedures was not tend to their safety behaviour [5]. Therefore, it is important to identify appropriate procedures for applying occupational safety and health system in different local conditions and the key factors in effectively using these procedures [6].

Safety procedural behaviour of electrical workers must be considered in order to make safety job in the workplace. Therefore, company such as PT. XYZ as largest company in airport operation has responsible to conduct safety management system must focus in consideration of safety procedural and their awareness in dangerous workplace such as electrical workplace.

In this case, electrical workers have one of safety concerned in the safety system. Electrical workers were gained bad implementation in safety inspection especially in PPE usage on their procedural job and safety behavioural. Therefore, this research was aimed to analyse the procedural of job that has been done and identifying all of hazard in every step of procedural then it was in consideration of worker's awareness in the implementation of safety management system. The

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procedural safety job analysis would like to provide hazard and the risk in every step to do the work that and the awareness level would consider commitment of safety management system, safety compliance, safety awareness, safety behaviour, work stress, safety teamwork and its influences. Therefore, by identifying the safety job and awareness analysis, the company can know the factors of safety awareness and create innovation on the safety management system in order to minimize the risk in steps of job then increase the worker's awareness in the implementation of safety system by analysing the most affected factors that influenced in awareness especially for electrical workers.

2 Research Methodology

2.1 Subject and Object

A total of ten electrical workers were employed for purpose of safety awareness. They all agreed to participate in this study, and filled out the questionnaires. Then, safety expert and all of electrical workers involved on the job safety analysis and accident reported data. The object of research are accident data, job safety activity and awareness of electrical workers.

2.2 Research Method

The research has been conducted by using job safety analysis in order to identify the hazard and risk in workplace. In addition, workers' awareness was assessed by questionnaires and direct interview. Moreover, direct interview is conducted to safety expert in company to support the data on job safety and awareness analysis.

2.3 Research Procedures

In this paper, the examination of awareness is following questions regarding safety awareness aspects.

1. Safety commitment of company
2. Safety compliance
3. Safety awareness of workers
4. Safety behaviour
5. Safety teamwork in electrical unit

The above aspects were analysed in deep interview and questionnaires that supported by expert analysis.
In addition, the flow and research procedures has been conducted following figure 1.

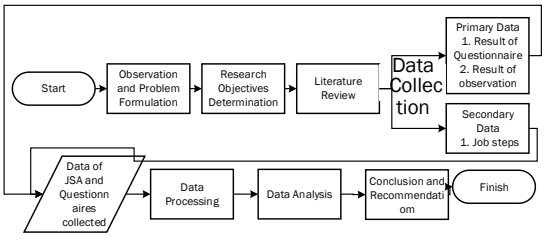

Fig 1. Research procedures

3 Result and Discussion

3.1 Job Safety Analysis

A Job Safety Analysis (JSA) is a qualitative analysis that must be done for job practice in order to identify the hazard and potential accidents that may occurred during the execution of the job [7]. Since the job in electrical unit is related directly to the machinery and electrical wave as potential risk may be occurred.

There are four main steps job as described on figure 2. Job Safety Analysis Lists. These steps were taken by procedural documents that has been provided. Since there is similarity of job procedurals so that the job safety analysis can be conducted as one analysis of job steps that depend on the direct field needed [8].

The unit has responsible to maintain all of electrical in the airport so that all of maintenance must be scheduled as soon as possible. There is no direct hazard identified so that the management must be accurate in creating maintenance schedule. Therefore, the condition of creating schedule must be in standard condition specially to minimize human error [6].

After scheduling was created, the next job procedural was in order to prepare all of tools, equipment and stuffs needed. Since majority population of workers was outsourcing workers so that workers has their own equipment. However, in the real activity of electrical maintenance, the tolerance was found between outsource workers to borrow the tools each other's. Unfixed properly location of tools that might be confused the engineers and waste their time to find it. In emergency condition, this problem would be turned into huge issues since the electrical problem must be maintained soon [9].

On the action activities, these steps can be focused as main activity that must be done by workers in order to finish, repair and maintain. The hazard depends on the electrical problems occurred in the airport. In these case of electrical problem in airport such as airfield lighting system, the hazard and risk potential might be electrical shocks. The electrical shock felt was also depends on the electrical problems found which is small, medium or large range of problems that has potential of explosion. Hence, all of personal protective equipment must be used in proper condition even in the short or long time hazards [10].

On the report process, there is no significantly hazard found. However, the proper standard for administrative of report must be considered such as standard temperature, dust and another physical work environments aspects that must be affected to the workers. Therefore, the condition of creating report must be in standard condition specially to minimize human error [6]. The result and discussion would be explained briefly based on sub-explanation.

Moreover, accidents can be avoided by understanding near misses and eliminating the root cause [11]. Therefore, it is important to create a list of accident occurred recently as described by Table 1.

Table 1. Accident list found

No	Accidents	Frequency	Comment
1	Small Range of electrical shock	almost every work	Prevented by using PPE properly
2	Med Range of electrical shock	large maintenanc e	Prevented by using PPE properly

3.2 Safety Awareness Analysis

Safety commitments of company has safety management system as authority of Safety and Health Environment Section. The management in safety can demonstrates how importance the usage of PPE. It has safety campaign program that has to be done in every month. It provides PPE needed for all workers in the airport as described on Figure 2.

Fig 2. PPE provision.

The training has been conducted in first work period. Therefore, the commitment of safety management to fulfil their responsibility has been fulfilled to conduct needed training in electrical unit. Routine inspection for every week so that all of incident, accident or hazard found can be minimized [12]. The management eliminate and cover hazard and communicate to the related section that has responsible to the hazard control.

Safety compliance shown that the unit is not actively discussing about safety. Hence, in case of accident and incident occurred has not been reported as list so that the safety management system also did not know the accident. It might be the habits and behavioural factors of workers that has impact to pretend the safety problem such as electrical shock has not been reported [5]. The cleanness is already arranged well. Moreover, the physical work environment was indicated in standard ratio for electrical workplace.

Safety awareness includes understanding of safety management is basic that begin by understanding the policy and rule of occupational safety and health [13]. The understanding as described on the Figure 3.

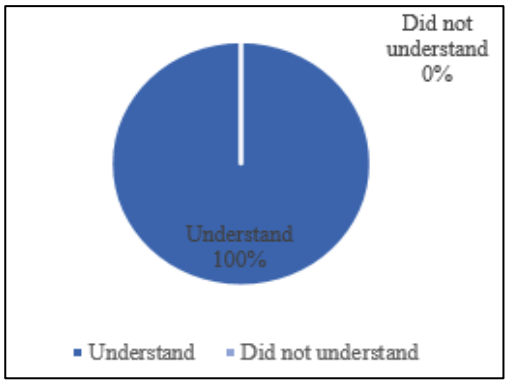

Fig 3. Safety understanding of workers

Then, in the activity of job they were not following the safety policy was not caused by the lack of understanding but it caused by behavioural and habits [5].

Safety behaviour measures the behaviour of workers in the workplace to implement their safety to finish their jobs. The priority made was the objectives to maintain problems rather than the safety principles. This case is main point that affected the safety worker's behaviour. In fact, the lack of PPE usage was caused by the confident level and the habits that they would be fine without any equipment. Therefore, the main cause in lack of safety behaviour is the habits of workers and confident level [5]. Then, there is no reward and punishment system on safety behavioural.

Safety teamwork shown that supervisor has given advices and control to prevent the hazard risk and accident. It is importance that must be often done by the supervisor because the supervising system in the safety management is one of best way to increase the safety awareness [14]. Then, workers have aware to give advice and comment to their team that does not use PPE and bend the safety policy. Moreover, all of machine procedures has been known by all of workers that maintained the machine. On the other hand, the reporting of accident occurred was not been controlled in all range of accident. In addition, the discussion to prevent the hazard almost done by safety management that applied by electrical units.

4 Conclusion

Based on the results and analysis that has been conducted the hazard found based on the job safety analysis are unfixed properly location of equipment that has risk to human error and confusion in wasting time to find it. Moreover, the electrical shock was hazard in small to medium range of shock. In addition, accidents in the last month occurred are small electrical shock in every activity of job and medium range of electrical shock in larger project maintenance. Moreover, the awareness level in the electrical unit has divided into several aspects. The safety commitment was done properly but needs to be improved, safety compliance was the unit did not actively discuss about safety yet, safety awareness is the workers understand and aware among safety implementation, safety behaviour in electrical has to be improved and

safety teamwork was done properly and still can be improved. Furthermore, the recommendation can be implemented are the implementation of behaviour-based safety (BBS) which is effectively increase the safety awareness among workers [15]. In addition, 5S implementation and accident report list also has to be conducted to maintain the sustain safety [16, 17].

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