

Safety Assessment in Workplace for Electricity Utility Company in Malaysia

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Abstract: *Electricity utility technical workforce are often exposed to risk, danger and hazards at workplace ranging from accidents, electrocution, electric shock, burns, coal dust and noise. Globally, electricity utility recorded the lowest occupational accidents compared to other sectors but the number of fatalities seems to be quite significant. These accidents cause personal loss to employees as well as financial loss to organizations and the economy. This study was conducted in a local electricity utility company with the main aim of assessing the relationship between awareness and compliance of occupational safety and health amongst the technical workforce. The variables utilized to measure occupational safety and health (OSH) compliance included job safety, co-worker safety, supervisor safety, management safety practices and satisfaction with the safety program. This study was done cross-sectionally by using 174 respondents from main arms of the utility such as generation, transmission, distribution and other related subsidiaries. Results indicated that OSH compliance relies upon co-worker safety, supervisor safety, management safety practices and satisfaction with the safety program. Dominant factors such as supervisor safety and satisfaction with the safety program have great implications towards OSH compliance. The implication of this study is defined by its contribution to the understanding of numerous ways management in an electricity utility could endeavor in its effort of increasing employees' well-being based on the needs of the employees and organizations.*

Index Terms: *Compliance, electricity, occupational health and safety, utility.*

I. INTRODUCTION

The present study reflects the actual scenario encountered by majority of technical workforce at a local electricity utility company, especially on the issues of occupational safety and health awareness at workplace. Previous studies have captured number of problems and weaknesses faced by the electricity supply industry which focusses on safety and health at workplace [27]. However, it is uncertain to present date on how safety culture influences the success story of any given electricity utilities in achieving zero incidents and accidents. In [2] asserted that the government has formulated various

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initiatives to ensure the employees' safety and health at workplace is not compromised. Yet, the characteristics shown by organization and employees would dictate whether the aforementioned aspiration will be achieved or otherwise [28], [29].

The common business structure of an electricity utility adopted worldwide comprises three main entities beginning from generation (power plants generating electricity), transmission (connecting the power plants and sub-stations) and distribution (delivery of power supply to the consumers) [11]. Each of the mentioned entities involves various processes and activities as well as exposing the utility workers to numerous occupational hazards. These workers might face injuries or occupational illness if preventive measures are not taken from the early stage. Prior to that, we have to accept the reality that utility workers have both direct and indirect relationships with the generated electricity. Electricity supply industry has not been spared from the possibility of accidents taking place which finally ends with fatalities [5]. In [27] stressed that four common injuries related to electricity are electric shock, electrocution, burn and fall. From the viewpoint of occupational illness, in [3] concluded that electricity utility workers are exposed to the risk of leukemia, brain and lung cancer. Therefore, these workers are not exempted from facing the occupational safety and health risk at workplace. Thus, the implementation of safety culture within the organization and amongst the employees has proven to be driving force to reach the status of zero accidents and injuries at workplace [9].

Work Safety Scale study conducted by [16] posited that safety management practices revolve around work safety, co-worker safety, supervisor safety, management safety practices and safety programs which play an important role in the formation of organization's safety climate influencing the safety compliance level. Numerous industrial accident models have accounted those aforementioned elements as individual social environment, workers behavior and personality [15], [17], [20] which contributed both directly or indirectly towards the accident at workplace. The effort to measure elements comprising workers related social environment could provide a better insight of the causal factors and consequences of industrial related accidents. Hence, this provide a basis for a specific study to be undertaken in electricity utility to fathom the influence of human factors in cultivating safe working practices within this organization. This is important to assess how far all relevant stakeholders are aware of the safety and health situation at workplace.

II. METHODOLOGY

The undertaken study utilizes surveying method,



which leverages upon quantitative approach to collate necessary information in order to achieve the objectives of this study [13]. Survey method could be better defined as direct acquisition of information from a group of individuals by questioning via interviews, questionnaires or psychological instruments [2], [12], [21]. This study intends to identify the awareness level of workers in an electricity utility towards occupational safety and health practices at workplace. Surveying method seems to be appropriate in the management of this study as the survey about respondents' perceptions and awareness towards the given set of questions. The developed questions were clearly stated to the extent whereby the respondents could answer them independently without the presence of the researcher. This study adopts the cross-sectional surveying method as it expedites the information gaining process and involves low operating cost [10]. Furthermore, in [10] advocated that the findings from this kind of survey seems to be appropriate to be utilized by relevant agencies for policy making purposes. Table 1 provides a demo-graphic profile of the respondents who participated in this study. The sample was dominated by male respondents (77%) and majority of the respondents fell in the 31-40 age group. The highest number of respondents are from technician group (32.2%). Almost 24% of the respondents have been serving their organization more than 20 years and approximately 58% of the respondents have electrical engineering qualification which seems to be a common trend for an electricity utility company.

Qualification	Mechanical	33	19
	Civil	9	5.2
	Others	32	18.4
Length of Service	Below 5 years	40	23
	6 to 10 years	37	21.3
	11 to 15 years	29	16.7
	16 to 20 years	27	15.5
	More than 20 years	41	23.6

III. RESULTS AND DISCUSSION

There are five categories and elements required by the legislations covered under Factory and Machineries Act, 1967 [13] and Occupational Safety and Health Act, 1994 [26] namely policy, safety training, workplace environment, employer, planning and implementation, evaluation and continual improvement efforts. One of the distinct feature of OSHA 1994 is the bylaw provision for the employer to come up with a policy pertaining to occupational safety and health which is clearly stated in Section 16 of OSHA 1994. In this questionnaire, majority of the technical workforce are aware of the existence of such written policy at corporate level. It is found that 94.3% (164 respondents) aware about the policy and only 5.7% are unaware about it. Hence, it could be concluded that the awareness level of the technical workforce on the existence of such policy is way above average and could be considered as the manifestation of self-regulation concept alluded by OSHA 1994. Bigger fraction of the respondents which represents 89.1% (155 respondents) from the overall study admitted that the written policy has been well-communicated to all level of staff in the utility. Nonetheless, only a few amounting to 10.9% (19 people) are totally unaware of such communication. As being demanded by Section 16 OSHA 1994, the electricity utility has complied with the requirement of developing a written policy and also communicating it to all staff in order to ensure the objective of this policy reaches the targeted audience. Section 16 OSHA 1996 requires the employer to communicate the policy to all employees. In this utility, the main medium of communication would be via notice board at workplace (29.9%), followed by exposure during training sessions and seminars (28.4%), announcement by management via directives or circulars (22.8%) and finally via explanatory sessions by Occupational Safety and Health Office (18.9%). OSHA 1994 advocates for the joint responsibility by both the employer and employees in implementing occupational safety and health related policies at workplace. The Act call for the establishment of Occupational Safety and Health (OSH) Committee at any workplace with at least 40 workers. We could observe that 94.3% (164 respondents) aware about the OSH committee and only 5.7% are unaware about it. It is imperative that the technical workforce is aware the existence of such committee as a mean of two-way communication whereby the employer could relay information and increase the interest and motivation of employees to place utmost importance on occupational safety and health related aspects. In addition to that the composition of this committee is integral to the

Table 1: Respondents' profile

Demography	Category	Frequency	Percentage
Age	Below 30 years old	52	30
	31 to 40 years old	66	38
	41 to 50 years old	21	12
	More than 50 years old	35	20
Gender	Male	134	77
	Female	40	23
Divisions	Generation	50	28.7
	Transmission	31	17.8
	Distribution	50	28.7
	Investment Management	43	24.7
Position	Technician	56	32.2
	Senior Technician	16	9.2
	Chief Technician	7	4
	Technical Executive	9	5.2
	Engineer	42	24.1
	Senior Engineer	15	8.6
	Manager	20	11.5
	Senior Manager	7	4
	General Manager	2	1.1
Engineering	Electrical	100	57.5



successful safety practices and governance at workplace. Table 2 shows the relationship between the dependent variable (occupational safety compliance) and independent variables (work safety, co-worker safety, supervisor safety, management safety practices and safety programs and policies) in Work Safety Scale. Pearson correlation coefficient was utilized to either reject or accept the null hypotheses, which were developed earlier.

From the analysis, we can conclude that co-worker safety, supervisor safety, management safety practices as well as safety programs and policies are related to the occupational safety compliance. Work safety seems not to be related in the context of an electricity utility. This could arise due to the safety culture has been embodied in the day to day operation of the company since mid-90s when the organization embraced a mechanism to self-audit its safety practices whilst ensuring uninterrupted power supply to its consumers. When a safety culture has immersed within an organization for almost three decades, it could be seen as part of the daily routine of its employees. However, it is closely associated to safety climate formed within a workplace and could be the main reason of any mishaps [6]. From the standpoint of co-worker safety, there is a direct relationship with occupational safety compliance. It is imperative to realize that safety climate evolved from both perceptions towards employee safety performance and behavior of a co-worker [18]. This is due to the nature of concern shown by a colleague creates an emotional attachment that could be exemplary for someone to adore the behavior of his co-worker [14]. Supervisor safety has positive link to occupational safety compliance as supervisors are seen as the source of guidance in the matters of workplace safety (Hsu et al., 2008). A worker could also be demotivated to practice good safety practices if his supervisor has no tolerance and too pushy [7]. Management safety practices relates to occupational safety compliance in terms of responsibility of an employer towards the safety and well-being of their employees at workplace [4]. Workers felt safe when their employer display utmost commitment towards safety and health matters at workplace. Therefore, management's role and committal could be seen as the best approach to alleviate the safety standards at workplace [4]. Finally, safety programs and policies clearly related to occupational safety compliance as this particular utility company has been accredited for ISO 14001 and OHSAS 18001. Having both standards as guidance in running the company's operation requires best practices to be adopted for protecting the safety and well-being of workers as well as general public.

Table 2: Results from Pearson correlation test

	Compliance Towards Occupational Safety and Health at Workplace	
	Pearson	Significance (2-Tailed)
Work safety	.085	.267
Co-worker safety	.212*	.005
Supervisor safety	.414**	.000
Management safety practices	.218**	.004
Safety program and policies	.464**	.000
**p ≥ .01, *p ≤ .05		

IV. CONCLUSION

In this paper has been established that co-worker safety, supervisor safety, management safety practices as well as safety programs and policies are related to the occupational safety compliance. However, work safety seems to be not influencing the dependent variable. It is endeavored that realizing this dominant factors to help the management of an electricity utility to tackle the effectiveness of occupational safety and health performance at workplace. Therefore, the safety and well-being of employees are guaranteed as electricity utility poses high risk of occupational injuries, illness and even death. However, there is a clear need for an extensive study pertaining to the context of this research due to scarcity of information regarding to safety and health in the Malaysian Electricity Supply Industry.

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