

Current Status of Industrial Accident Learning in Malaysia

Kamarizan Kidam^{a*}, Zainazrin Zainal Abidin^a, Zulkifly Sulaiman^b, Mimi Haryani Hashim^a, Adnan Ripin^a, Mohammed Wijayanuddin Ali^a, Hazlee M Safuan^a, Saharudin Haron^a, Norasikin Othman^a, Zaki Yamani Zakaria^a, Mohamad Fazli Masri^b, Syed Abdul Hamid Syed Hassan^b, Nazruddin Mat Ali^b, Azman Ahmad^b and Hairozie Asri^b

^a *Department of Chemical Engineering / Institute of Hydrogen Economy, Universiti Teknologi Malaysia, 81310 UTM Johor Bahru, Malaysia.*

^b *Department of Occupational Safety and Health, Aras 2, 3 & 4, Blok D3, Kompleks D, Pusat Pentadbiran Kerajaan Persekutuan 62530 W. P. Putrajaya, Malaysia.*

*kamarizan@cheme.utm.my; zulkifly_s@mohr.gov.my

Abstract

The accident rate in Malaysia is decreasing; however, statistically it is still high if compared with other developing nations. One of the reasons why accidents keep on happening is due to poor learning from accidents. This paper discusses the level of accident learning from accident reports submitted to the Department of Occupational Safety and Health (DOSH) Malaysia and the Society Security Organization (SOCSO) Malaysia involving 1,291 accident cases. Based on the quality and completeness of accident reports, their levels of learning were classified into five accident causation levels which are no, limited, fair, good and excellent learning.

Keywords: Accident Report, Accident Analysis; Level of Learning; Accident Causation; Action Plan

1. Introduction

In Malaysia, it is a legal requirement under Occupational Safety and Health Act (OSHA) 1994 for employers to report any accident at the workplace. At the company level, considerable resources have been used for investigation and reporting of accident cases to the Department of Occupational Safety and Health (DOSH) Malaysia such as via JKKP 6 and JKKP 9 forms. Such accident reporting form will enable the analysis and continuous learning process of unwanted industrial occurrence. These analyses would provide a better understanding on how accidents occur at the workplace.

Although the occupational accident rate in Malaysia is decreasing recently, however, statistically it is still high if compared with other developing and developed nations such as Singapore. One of the major reasons why accidents keep on happening is due to poor learning from accidents that allow similar accidents to recur. In fact, according to Drogaris (1993), for the large majority (>95%) of accidents, the causes are known, foreseeable and can be prevented by using the existing knowledge and technology. The poor accident learning may be due to weaknesses in accident reporting as a result of poor input quality, poor investigation, lack of analysis, and wrong interpretation of evidence (Kletz, 2009) as well as ineffective of information dissemination (Lindberg and Hansson, 2006). Thus, only one third of the accident cases studied is considered to provide lessons learnt on a broader basis (Jacobsson et al., 2010).

Currently in Malaysia, the level of learning from accident reports is less studied and almost ignored. This paper explores accident learning by examining accident reports

submitted to DOSH Malaysia and Society Security Organization (SOCISO) Malaysia involving 1,291 accident cases. Based on the quality and completeness of information available in each accident report, the level of learning was classified into five accident causation levels which are no, limited, fair, good and excellent learning. The findings of the study are essential in knowing the quality and level of the accident learning in Malaysia and appropriate action plans could be implemented for enhancing learning from accidents.

2. Research Approach

In this study, 1,291 accident cases from DOSH and SOCISO databases are analyzed by using data mining methodology. The overall goal of this study is to extract information from accident reports and transform it into an understandable structure i.e. qualitative data for frequency analysis. The level of accident learning based on the accident causation level was measured by examining the accidents reports i.e. JKPP 6 and JKPP 9 from DOSH as well as Form 21 from the SOCISO database.

In order to determine the level of accident learning, the understanding of “*What can we learn from accident reports?*” should be questioned. The level of accident learning within the accident reports was determined based on the accident causation level. The accident causation level comprises the three important breakdowns of causes that required the investigation of its underlying causes of accidents. The breakdown of causes comprises first, direct causes which emphasized on what kind or type of accidents that leads to employees’ injuries or properties damaged. Second, indirect cause or known as contributing factors which considered two elements: unsafe acts and unsafe conditions and while the third is root causes of accidents. These root causes of accidents are crucial parts in investigating the main causes of accidents or incident occurrences. In summary, any accident reports categorized as no learning means the report did not give any information on the causes of accidents. Meanwhile, an excellent category of accident learning provides at least three causal factor analyses i.e. direct, immediate and root causes with good corrective action to prevent similar accidents.

3. Results and Discussions

In this paper as many as 1,291 accident cases reported to DOSH and SOCISO were analyzed to find the industrial accident learning in Malaysia. Based on the frequency analysis of the accident reports, the current status of the industrial accident learning in Malaysia is summarized in Figure 1. As shown in the figure, majority of accident reports were classified as providing a poor learning (59%). Only 9% of accident reports provide a good and excellent learning. Meanwhile, about 30% of accident reports give fairly industrial learning, while 2% of them are classified as no learning at all.

The study reveals that there is serious quality problem in the accident reporting system in Malaysia. More than 60% of accident reports fail to provide sufficient information for accident prevention that for effective learning from accidents. The finding clearly indicates the reason why a similar accident occurs frequently in Malaysian industry.

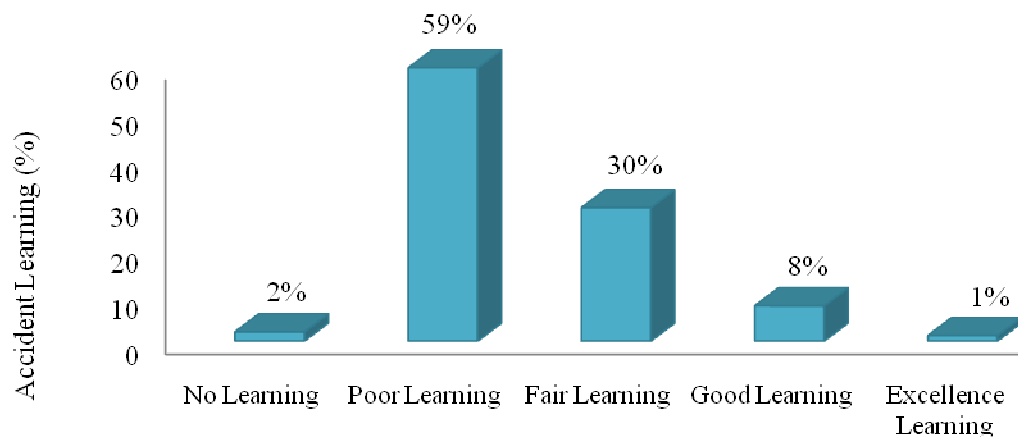


Figure 1: The level of accident learning in Malaysia.

Analysis shows that there are several weaknesses of accident reported to DOSH and SOCSO databases. Large majority of accident reports were incompletely submitted. This may be due to lack of analysis and investigation as discussed in detail by Professor Trevor Kletz in his outstanding publication (Kletz, 2009). In most accident reports, the accidents were reported in a very simple way and lacking the essential accident information especially on why and how the accident happened. Almost all of the accident reports tell only plain statements on the direct cause of accident without meaningful explanation of what was really going on. Furthermore, most of the accident reports did not emphasize on accident causation in detail thus providing limited accident learning. Here are some examples of accident reports that clearly indicate their quality.

Box 1 is an example of an accident report that provides no learning. The weakness of this category is that the accident reports only describe the effect from the accident to the workers. No clear explanation was given on the causes of the accident. In this example, the accident might not have been investigated and the report was prepared by a clerk, i.e., an incompetent person. The accident may have occurred at a small and medium enterprise (SME).

Box 1 (No learning level)

Report: The workers' fingers were injured.

Accident Analysis: no analysis can be done due to insufficient information.

Box 2 is an example for poor accident learning. In this example, the common weaknesses are due to limited accident information that was documented especially on direct causes of accidents/incidents. There was no further contributing information and root causes of accident suggested for instant factors such as working environment, ladder condition, human factors, weather, etc. In this example, the accident may happen in the services sector that in practice they have limited knowledge, information, and accessibility in relation with the site hazard of the company being served. The report might be prepared by the supervisory level that has limited safety knowledge.

Box 2 (Poor learning level)

Report: Worker fell from a ladder at a height of approximately 3.5 meters while installing the new phone lines for residential customers.

Accident Analysis: Direct cause: Fell from a ladder at a height of approximately 3.5 meters.

Box 3 is an example for fair accident learning. The accident learning for fair level was providing information on direct and contributing cause however information for root cause was lacking. To identify the root causes, the investigator/reporter should have a solid working experience and OSH knowledge.

Meanwhile, **Box 4** is an example of a good quality accident report that facilitates learning. Here, all of the causal factors (direct, contributing and root causes) of the accident are reported and analyzed. However the report contains insufficient recommendation for accident prevention and mitigation.

Box 3 (Fair learning level)

Report: The victim was hit by a forklift during crossing the forklift path and suffered a chest injury.

Accident Analysis: Direct cause: Hit by a forklift. Indirect cause: Unsafe act: Using the forklift path instead pedestrian walkways. Root Cause: Did not describe for root cause.

Box 4 (Good learning level)

Report: Burns on the back of body after forklift handled by victim hits drain valve. The drain valve broke and hot water splashed unto his body. The victim had driven the forklift at more than the allowed speed in that area. The victim had never attended the forklift training. There is no safety operating procedure (SOP) for forklift drivers.

Accident Analysis: Direct cause: Burns at the back of body after drain valve broke and hot water splashed victim's body. Indirect cause: Unsafe act: Drive forklift at high speed. Root cause: No forklift training, SOP and control measure for forklift usage.

Recommendation: Suggested but may not be sufficient to prevent accidents.

Box 5 describes an example for excellent level of accident learning. This level of learning provides learning very well where all three causal factor analysis (direct, contributing and root causes) has been analyzed in a detailed way with further improvement being documented.

Box 5 (Excellent learning level)

Before: At 8 am, the victim saw the machine in dirty condition at the casting area.

During: The victim was trapped in the casting machine while cleaning it without switching off the machine.

After: The victim suffered severe injury which required the victim's hand to be amputated up to the arm.

Additional info: No HIRARC has been done at casting area, supervisor is not in casting area at that time and no SOP provided. Control measure need to be taken where, any working process need supervision, provide SOP at the nearest machine area. Implement HIRARC immediately and machine maintenance is required.

Accident Analysis: Direct cause: The victim was trapped in the casting machine which caused severe hand injury. Indirect cause: Unsafe act: Did not switch off machine while handling. Root cause: No supervision, HIRARC and SOP.

Recommendation: Any working process needs supervision, provides SOP. Implement HIRARC immediately, machine maintenance is required and train other workers.

4. Conclusion

A study on the quality of the accident report and its industrial accident learning has been carried out by utilizing 1,291 accident reports available in DOSH and SOCSO databases. The study found that the majority (>60%) of the accident reports are providing a poor or limited industrial accident learning, which hindered meaningful analysis and learning process. Only less than 10% of the accident reports provide a good quality report that facilitates learning for accident prevention. It can be concluded that there is an urgent need to provide assistance and training to guide affected companies to produce meaningful accident report as depicted by Box 5 (Excellent learning level). To enhance the industrial accident learning in Malaysia, we need to continuously educate workers or plant owners on the importance of their participation by proper accident investigation and reporting. Massive effort should be focused on depth analysis and detailed investigation to identify the underlying causes of accident. The OSH value on “*what*” and “*why*” accidents occur needs to be highlighted and disseminated to promote industrial accident learning via workshop, training, forum and seminars.

Sufficient time and resources for investigation process would also assist in identifying the root causes of accidents. The form of accident reports (JKKP 6, JKKP and FORM 21) used could be improvised. The current practice on the disseminating accident information through physical means seems to be less effective to enhance accident learning. A new systematic and online accident reporting system framework is proposed to provide better utilization of accident data. An accident database with a good data retrieving system is preferred for an effective accident analysis and learning from accidents.

Acknowledgements

This work was supported by Department Occupational Safety and Health (DOSH) Malaysia and Society Security Organization (SOCSO) Malaysia.

References

Drogaris, G. (1993). Learning from major accidents involving dangerous substances. *Safety Science*, 16 (2), 89–113.

Jacobsson, A., Sales, J., and Mushtaq, F. (2010). Underlying causes and level of learning from accidents reported to the MARS database. *Journal of Loss Prevention in the Process Industries*, 23(1), 39-45.

Kletz, T. A. (2009). Accident reports may not tell us everything we need to know. *Journal of Loss Prevention in the Process Industries*, 22(6), 753-756.

Lindberg, A. K., and Hansson, S. O. (2006). Evaluating the effectiveness of an investigation board for workplace accidents. *Policy and Practice in Health and Safety*, 4(1), 63-79.