EXTENDED ABSTRACT

STUDY ON MACHINERY HAZARDS AND RISKS IN APPAREL INDUSTRY (SPECIAL REFERENCE TO MAS KREEDA VAANAVIL (PVT) LTD)

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Abstract

This study was designed to look at machinery hazards and risks in the apparel industry to find out how these injuries start and how they can be prevented. Researcher used qualitative method study. In order to validate the direct observation findings personal interview was used. Data was collected through direct observation and personal interviews. Researcher has done direct observation from 100 machine operators and personal interview has been conducted among 20 machine operators to whom the direct observation was done. The results demonstrated that Ergonomic, mechanical, electrical, thermal, Vibration and Noise hazards and risks have been raised by machines. Those hazards and risks may be causing accidents and diseases. Researcher found the solution for these issues. Engineering controls and administrative controls can minimize the uncertainties. Control of Administrative utilize work framework to lower hazards and risks by providing a proper and planned policies and ideas. Moreover, Engineering controls also provide and reduce these risks.

Keywords: Apparel industry, engineering controls, administrative control, hazards and risks assessment

1. Introduction

Successful health and safety management is a process of protecting people by continuously making successful decisions. The current research is an attempt to offer a flexible risk assessment method to assess hazards at workplaces. The basic aim of a risk assessment is to prevent accidents (Harms-Ringdahl, 2001). This study conducted for machinery risk assessment and identify the solutions. During last seven months (January to July) 12 skilled laborers were victims. Under that, 9 accidents were machinery accidents. These indicates that majority of accidents were happened from machines.

The laborers while sewing, cutting, printing processes undergo accidents. Not only accidents but also, they are affected from illness because of the machineries. This is the major problem that faced by employees. A risk assessment is simply a careful examination of what, in workplace, could cause harm to people, so that you can determine whether you have taken enough precautions or should do more to prevent harm (OSHA,2011). Workers and others have a right to be protected from harm caused by a failure to take reasonable control measures. Accidents and ill health can ruin lives and affect your business too if output is lost, machinery is damaged, insurance costs increase or you have to appear before the court. WRAP and the law in many countries require you to assess the risks in your workplace so that a plan is put in place to control the risks.

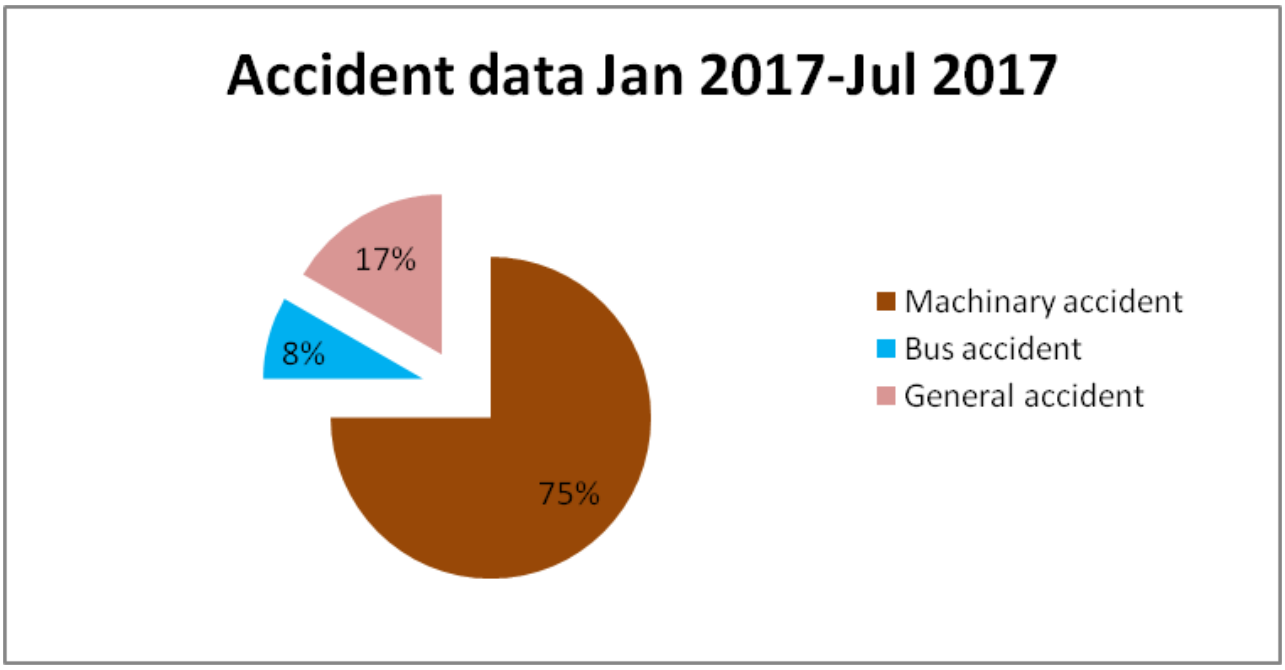

Figure 1. Accident data, Source: Accident investigation report, 2017

Table 1. Accident details from January 2017-July2017,Source: Accident investigation report of MAS KREEDA Vaanavil, 2017

Type of accident	Count
Machinery accident	9
Bus accident	1
General accident	2

2. Literature Review

Occupational Safety and Health (OSH) is a multi-disciplinary concept that concentrates on the promotion of safety, health and welfare of people engaged in work or employment (Bhagawati, 2015). According to Alli (2008), OSH is generally defined as the science of the anticipation, recognition, evaluation and control of hazards arising in or from the workplace that could impair the health and well-being of workers and taking into account the possible impacts on the surrounding communities and the general environment. As per International Labor Organization (2010), OSH is a discipline with a broad scope involving many specialized fields. OSH in workplace is one of the core concepts considered by all kinds of organizations to be responsible for protecting and optimizing the functionality of human resource (Eddie & Fang, 2004). It helps to control the dangers which are emerging from physical, chemical, and other work environment perils so as to set up and keep up a safe and sound workplace (Mohibullah, et al., 2018). Moreover, as Amponsah and Dartey (2011) described, OSH captures the mental, emotional and physical well-being of the worker in relation to the conduct of the work and as a result, marks an essential subject of interest impacting positively on the achievement of organizational goals. Therefore, OSH management system helps to achieve the effective quality management, protection of the working person and the environment (Tawiah & Mensah, 2016).

3. Methodology

Researcher chose a smaller sample of individuals that represent the larger group. Researcher took 100 machine operators as sample. For this study 60 Sewing machine operators, 20 cutting machine

operators, 15 Printing machine operators and 05 Mechanical machine operators have been taken as sample for this study. Convenience sampling technique is used for this study. It is a one of the methods in a non-probability sampling tool which based on data gathering from whole population members who are easily available to participate in research. Researcher used direct observation and personal interview. Secondary data collected from the record of accident and illness reports for the year of 2017 based on MAS KREEDA vaanavil. Qualitative data analyze is carried by thematic analysis through Nvivo software. Further it will assess through hazards and risks assessment rating and hazards risks assessment cycle which is introduced by wrap. The hazards and risks assessment rating determines whether there is sufficient protection to continue work or whether additional control measures are required to further reduce or eliminate hazards and risks.

4. Results/Analysis and Discussion

The researcher found that noise, thermal, electrical, mechanical, substance, vibration and ergonomic hazards and risks could happen due to machinery. In order to validate observation results researcher undertook interview too.20 employees were participated. Different machinery operators were interviewed by researcher. Researcher took interviewees among those who observed earlier. Researcher took five operators from each machine. Potential hazards from excessive noise are Exhaust systems, high-speed gas leaks, manufacturing processes (stamping, cutting,) moving parts, scratching surfaces, unbalanced rotating parts, whistling pneumatic devices, wearing parts, and causing hearing loss or other physiological effects. Based on observational studies, the identified potential consequences include discomfort, loss of consciousness, and loss of balance, permanent hearing loss, stress, tinnitus, tiredness, and interference with voice communication/audio signals. One of the basic occupational hazards and risks is dust.

The main sources of harmful dust emission at the workplace are technological processes. Fabric dust can be affecting the lungs of operators, may affect the lungs adults and may reduce life expectancy by a few months, mainly in subjects with pre-existing heart and lung diseases. Mostly sewing employees and cutting employees are affected. In contrast, sewing dust is lower than cutting dust. Researchers derive solution ideas from compliance and sustainability directors, engineering directors, and auxiliary data (such as the Nike Code of Conduct and OSHA). The engineering supervisor explained the use of machine guards, and the compliance supervisor explained the employee health and safety section. Based on the recommendations of WRAP, OSHA (Occupational Safety and Health Association) and Health and Safety Guidelines. In addition, the researchers also learned degrees from NIKE CODE, OSHA, and WRAP.

Machines can cause many types of hazards and risks. It can be avoided in the clothing industry. It can be reduced. Based on the above results, research shows that noise, heat, electrical, mechanical, material and ergonomic hazards and risks will increase. Sewing, cutting, printing and maintenance operators are directly related to the machine. Cause them to be affected by accidents or diseases due to this hazards and risks. According to the given solutions, the researchers divided these solutions into two parts. Those are; engineering control and administrative control. Engineering control refers to the physical changes in the work area or process, effectively minimizing the hazards and risks of exposure to workers. Administrative control includes various policies and requirements established at the administrative level. Engineering control and management control can reduce these hazards and risks. Engineering control helps to modify the machine that can support the operator. Management control helps to understand the operator.

5. Conclusion

The following conclusions have been revealed by analyzing the direct observation and personal communication with the employees of MAS KREEDA VAANAVIL(PVT)LTD. The psychological side of the work environment cannot be underestimated both as sewers often face a monotonous work

and a constant time pressure Injuries and accidents affecting these are common problems for workers in the clothing industry. The researcher found that Ergonomic, mechanical, electrical, thermal, Noise risks have been raised by machines. Those risks can't be eliminated. But can be reduced. Those risks may be causing an accidents and diseases such as breathing difficulties, cancer, corrosion, explosion, infection, neurological disorder, trauma of the spine, vascular disorder, Headache, Hearing loss and burn. Based on health and safety requirement organizations have to more concern on employee's safety. NIKE code of conduct also says that zero near miss and zero accidents. Occupational health and safety association validates that providing a safe and healthful workplace to workers. Researcher found the solution of these issues. Where exposure to machinery and equipment hazards cannot be eliminated or substituted for machinery and equipment of improved design, risk control must be applied to the hazards that prevents or reduces the risk of injury or harm. Health and safety laws require the highest order control be applied so far as is reasonably practicable. Higher order machinery and equipment risk controls are preventative by nature, are effective and durable for the environment it is used in, and deal directly with the hazard at its source. Administrative controls use systems of work to reduce risk by providing a framework of expected behaviors. Those are taken frequent break, drink more water to prevent heat stress, Personal protective equipment usage, Proper training, Continuous supervision and job rotation. In the engineering controls, lockout and tag out strategy, guards such as needle guard, finger guard, eye guard, modification in the machines, redesign an experiment, piece of equipment or process to make it less hazardous can be done.

6. Contribution of this study

Psychologically, physically and socially the employees will be released without accident fear for these workers could work hard and happily. Further, Company will be able to produce high quality products to market with either no or minimum risk of machinery accidents. Employees will be motivated. Through that they can increase their efficiency. Organization can save money due to reduce medical expenditures of the employees.

7. Recommendation

Organization can follow the elimination and substitution technique. That means removing the hazard Substitution refers to replacing a hazardous substance or process with a less hazardous one. Arrange operators meeting weekly. Management can identify the risks from machineries and can be identify the causes. Companies can substantially reduce the risk of equipment failure by combining regular, properly conducted equipment inspections with a maintenance program that includes preventative and predictive maintenance in addition to reactive maintenance. Under stress or physical or psychological effect expose machineries should be avoided. Give proper awareness about the structure and operation of the machinery to the operator. By using accident investigation reports organization can predict when it's going to fail and take corrective action earlier. Moreover, Appoint Engineering person and HR person for each cell, cutting tables, maintenance and printing section. Then they can identify the risks in both perspectives engineering and administrative perspective. Furthermore, prepare checklist for every personal protective equipment and have to monitor daily. It can help to remove damaged PPEs and getting PPE without delay. If the abnormalities happen in machines, appropriate action should be taken to rectify or repair immediately.

8. Directions for future research

Data were collected in apparel industry. Although this sample was appropriate for examining machinery risks in any industries, future studies should systematically examine the effects of the model such as, industry, and country differences to determine whether the pattern of our findings is generalizable to other contexts. Future Research should take place in other provinces within Sri

Lanka in order to improve the generalizability of research findings. It is recommended that larger samples, which will provide increased confidence that results would be consistent across similar groups, be used.

References

Zaman, M., Nguyen, M. L., Šimek, M., Nawaz, S., Khan, M. J., Babar, M. N., & Zaman, S. (2012). *Emissions of nitrous oxide (N_2O) and di-nitrogen (N_2) from the agricultural landscapes, sources, sinks, and factors affecting N_2O and N_2 ratios*. Intech Open.

Dartey-Baah, K. (2015). Resilient leadership: A transformational-transactional leadership mix. *Journal of Global Responsibility*.

Harms-Ringdahl, L. (2001). *Safety analysis, principles and practice in occupational safety (2nd ed.)*. CRC Press. ISBN: 9780415236553, p. 302

Kuranchie-Mensah, E. B., & Amponsah-Tawiah, K. (2016). Employee motivation and work performance: A comparative study of mining companies in Ghana. *Journal of Industrial Engineering and Management (JIEM)* 9(2): 255-309.

Muhammad, B., Khan, S., Mohibullah, M., Kasi, A. K., & Ghani, M. (2018). Planktonic foraminiferal biostratigraphy and depositional setting of the Cretaceous Parh Limestone, Quetta, western Sulaiman Fold-Thrust Belt, Balochistan, Pakistan. *Journal of Himalayan Earth Sciences* 51(2A): 8–23.