Risk Management on Print Checking of Plastic Sacks Production in Sidoarjo Indonesia

Manajemen Risiko Pengecekan Printing pada Pembuatan Karung Plastik di Sidoarjo Indonesia

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ABSTRACT

Introduction: Risk management is a management activity that aims to reduce risk to prevent negative impact. In printing activities, contact between humans and machines is unavoidable. The Accident data mention that the accident work mostly happens in print checking activity. The purpose of this study was to evaluate the risk management on print checking of plastic sacks production in Sidoarjo Indonesia by conducting hazard identification, risk assessment which includes risk analysis and risk evaluation, control assessment, and residual risk assessment. **Methods:** This is an observational study with a cross sectional design. The subjects in this study were all workers of print checking of plastic sacks in Sidoarjo Indonesia. The variables of this study included hazard identification, risk assessment, risk control, and residual risk assessment. Data included primary and secondary data. Primary data were taken by interview and observation. Secondary data were taken from work accident data. **Results:** A total of six hazards were identified. Risk assessment recorded two low hazards category, two medium hazards category, and two high risk hazards. Administrative control in the form of inspection and the use of Personal Protective Equipment (PPE) was implemented. Residual risk assessment shows that the implementation of controls was not optimal. The results of the residual risk assessment indicate that several risk categories fell into a lower category i.e. four low hazards category and two high risk category hazards. **Conclusion:** The applied risk management has not been optimally implemented.

Keywords: hazard, printing checks, risk managementt

ABSTRAK

Pendahuluan: Manajemen risiko adalah kegiatan pengaturan risiko yang bertujuan untuk menurunkan risiko sehingga tidak menimbulkan dampak negatif. Aktivitas pengecekan printing yang dilakukan terdapat kontak antara manusia dan mesin. Data kecelakaan menyebutkan bahwa kecelakaan kerja sebagian besar terjadi pada aktivitas pengecekan printing. Tujuan penelitian ini adalah mengevaluasi manajemen risiko pengecekan printing pada pembuatan karung plastik di Sidoarjo Indonesia dengan melakukan identifikasi bahaya, penilaian risiko yang meliputi analisis risiko dan evaluasi risiko, penilaian pengendalian, dan penilaian risiko sisa. Metode: Penelitian ini termasuk penelitian observasional dengan rancang bangun cross sectional. Subjek dalam penelitian ini adalah semua pekerja pengecekan printing pada pembuatan karung plastik di Sidoarjo Indonesia. Variabel dalam penelitian ini meliputi identifikasi bahaya, penilaian risiko, pengendalian risiko, dan penilaian risiko sisa. Pengumpulan data meliputi data primer dan data sekunder. Data primer diambil dengan wawancara dan observasi. Data sekunder diambil dari data kecelakaan kerja yang tercatat. Hasil: Penelitian didapatkan 6 bahaya yang telah teridentifikasi. Penilaian risiko didapatkan 2 bahaya termasuk kategori rendah, 2 bahaya kategori sedang, dan 2 bahaya termasuk risiko tinggi. Pengendalian yang telah dilakukan yaitu pengendalian administrasi berupa inspeksi dan Alat Pelindung Diri (APD). Penilaian risiko sisa didapatkan pengendalian belum optimal pelaksanaannya. Hasil penilaian risiko sisa didapatkan beberapa kategori risiko dapat turun menjadi kategori yang lebih rendah yaitu menjadi 4 bahaya kategori rendah dan 2 bahaya kategori risiko tinggi. Simpulan: Manajemen risiko yang diterapkan belum optimal pelaksanaannya.

Kata kunci: bahaya, manajemen risiko, pengecekan printing

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INTRODUCTION

Hazard is a source that has the potential to cause harm. Hazards contain risks that can have a negative or positive impact (Australia Standards/ New Zealand Standards, 2009). Martins (2015) in its guide of Investigation of Occupational Accidents and Diseases defines danger as anything that has the potential to cause harm to worker, such as chemicals, electricity, working on stairs, unattended machinery, open storage, demanding and stressful work. The workplace danger is the interaction of the elements of production, which include humans, equipment, materials, processes, and work methods so that the production process brings interaction between humans and machines, materials, work environments which is accommodated by work processes or procedures (Ramli, 2010). International Labour Organization (2013) in the occupational safety and health guidelines defines risk as a combination and the consequences of a hazardous event and the chance of such an event. Risk is described as an opportunity or probability of a danger to cause accidents and the severity (Ramli, 2010).

Workplace accidents are one of the negative effects of the presence of a risk-containing hazard. Workplace accidents are not desirable and often unpredictable that they can cause losses both time, property, property, and casualties that occur in the industrial process (Tarwaka, 2017). Workplace accidents are all work or company related accidents. This is related to work and company as the accidents occur due to work or when doing work (Anizar, 2009). Workplace accidents do not happen by accident. It happens because of reasons. Such accidents must be examined, so that further corrective actions for the cause of the accidents and the preventive efforts can decrease the occurrence and reoccurrence of the accidents (Suma'mur, 2014).

The Martins (2015) in its guide of Investigation of Occupational Accidents and Diseases defines work accidents as an event that arises from or in the work process that causes fatal and non-fatal injuries, such as falling from height or contact with a moving machine.

Work safety in the industry is highly important as it involves the lives of many people (workers). The application of safety in work can create security at work. Tarwaka (2017) explains that work safety is a safety related to machinery, appliances, work tools, materials and its processing, work basis, work environment, ways of doing work and production processes. Work safety aims to protect and guarantee the worker safety. Workplace safety can prevent work accidents that can cause human losses and damage to equipment or machinery as well as extensive environmental losses (Tarwaka, 2017). One of the efforts in implementation of OSH has created a workplace that is safe, healthy and free of environmental pollution so that it has can be free from work accidents and work-related diseases which can ultimately increased work productivity (Yenita, R, 2017)

Risk management is an effort to realize safety in work. Australia Standards/New Zealand Standards (2009) defines risk management as a coordinated activity to direct the organization regarding the risks experienced. OSH risk management is the management of a OSH risk to prevent unwanted accidents in a comprehensive, planned and structured manner in a good system (Ramli, 2010).

Australia Standards/New Zealand Standards (2009) defines risk management process as a systematic application of management policies, procedures, communication, consulting activities, establishing context, and identifying, analyzing, evaluating, controlling, monitoring and reviewing risks. According to (Tarwaka, 2017), hazard identification is a process carried out to identify all situations and events that could be the potential cause of work accidents and work-related illnesses that may occur in the workplace. Risk analysis is determining the amount of risk which is a combination of the likelihood and severity or consequence of risk when it occurs (Ramli, 2010).

To evaluate whether the risk is acceptable or not, it is compared with the standards or the ability of the organization to deal with it (Ramli, 2010). The purpose of risk evaluation is to make key decisions about the risks based on the results of the risk analysis, to decide which risks need further treatment (Australia Standards/New Zealand Standards, 2009).

The application of risk control must consider whether these controls can be applied and provide benefits to each workplace (Tarwaka, 2017). The risk control phase is the implementation of risk management efforts in the company (Ramli, 2010).

Existing risks cannot be totally eliminated by risk control, so that the occurrence of residual risk after the risk control is normal. Residual risk is defined as is the amount of risk or danger associated with an action or event remaining after natural or

inherent risks have been reduced by risk controls (Australia Standards/New Zealand Standards, 2009).

According to the International Labour Organization (2013), there have been more than 250 million accidents in the workplace every year, even 1.2 million workers die from accidents and illness in the workplace. The number of work accident in east java in Indonesia big enough for years 2015 has reached 105,182 cases with the number of workers have died as much as 2,275 people (Department of Manpower and Transmigration, 2016). Data and Information center of the Center for Data and Information of the Ministry of Health of the Republic of Indonesia (2015) reported increasing work accident cases in Indonesia during the four years period of 2011 to 2014. The lowest occurrence was in 2011 with 9,891 cases, and the highest was in 2013 with 35,917 cases. Work accidents from 2011 to 2014 were 9,891 cases, 21,735 cases, 35,917 cases, 24,910 cases respectively. During these years, East Java reported decreasing work accidents during the first three years and surge increase in 2014. The cases of work accidents in East Java from 2011 to 2013 were 2,205 cases, 1,954 cases and 188 cases respectively. The decreasing number suddenly increased in 2014 to the number of 2,283 cases.

A manufacturing company is a company that in its production process processes raw materials or raw materials into finished products to be used by consumers. Production activities in manufacturing companies involve a lot of labor and there is contact between humans and machinery so that protection is needed so that workers are safe while working. Manufacturing companies are companies which process raw materials into finished ready-to-used products. Production activities in these manufacturing companies involve a lot of labor and machinery. Therefore, contact between humans and machines is inevitable. Given a large amount of human and machine contact in these companies, workers protection is needed to ensure the worker safety during working period.

Based on risk management research conducted by Novita and Nawawinetu (2018) the application of controls could reduce the level of risk. In another study, Khasanah and Nawawinetu (2018) stated that there were 2 hazards in the high category, 22 hazards in the medium category, and one hazard in the low category. After the control was performed, 5 hazards fell into the medium risk category and 20 hazards fell into low risk category. Study by Tantia, Jayanti

and Ekawati (2016) stated that the accurate control from risk factor is very important, so Occupational Health and Safety (OHS) risk management is very needed in the company to find the accurate control. Research by Rositasari, Widaningrum and Iqbal (2015) stated that Risk control shows the effective to reduce the potential hazard at workplace. Risk control on a hierarchy of risk management control based on need to reduce risk.

The process of producing plastic sacks contains hazards and risks of workplace accidents. The activity of producing plastic sacks is performed by machines, both operated by humans and that which only need monitoring in the activities. One of the activities in producing plastic sacks is print checking. Print checking activity is monitoring of the stamp stage so that succeed, and if there is ink dripping immediately cleaned. Ink drop is cleaning by hand without protection when the machine is running. The initial interview with HSE was found that print checking activity often occur accident, evidenced by accident data that most work accidents occur in print checking activity. Print checking activity involves contact between humans and machines. Jobs related to machinery are very dangerous can cause work accidents.

The plastic sack manufacturing company in Sidoarjo is a company that is in the process of developing OSH policy. So far, several policies relating to OSH have been implemented in this company, for example, the use of Personal Protective Equipment and work instructions. However, the policy has not run optimally because the company does not have Occupational Safety and Health Management System (OSHMS). Therefore, the OSH programs and policies that are running are not well monitored. Currently, the management was focusing on making OSH policy. The existing OSH program was under increasing supervision. Thus, it could be immediately evaluated whether the program had been running as intended or not.

Risk management activities in the manufacture of plastic sacks in Sidoarjo include identification of hazards, while other risk management activities such as risk assessment have never been carried out. In relation to the dangers and risks and the conditions above, hazard control efforts need to be carried out so that they can prevent work accidents. The purpose of this study was to evaluate the risk management on print checking of plastic sacks production in Sidoarjo Indonesia.

METHODS

This is a descriptive study that aims to describe a situation. This is an observational research for it observed and recorded phenomena. Cross sectional design was applied. The subjects in this study were all workers (6 workers) of print checking of plastic sacks in Sidoarjo Indonesia, Health Safety Environment (HSE) section and the heads of the Roll to Roll unit. This research location on plastic sacks production in Sidoarjo, Indonesia. This study was conducted in January-May 2019.

The variables of this study included hazard identification, risk assessment which included risk analysis and risk evaluation, risk control, and residual risk assessment. Data collection were in the form of primary data and secondary data. Primary data were obtained from observations using the Hazard Identification Risk Assessment, Determining Control (HIRADC) observation sheet and interview to all workers (6 workers) on print check, HSE, and head of the Roll to Roll unit using interview guideline from (Australia Standards/New Zealand Standards, 2009). Secondary data collected includes work accident data and Job Safety Analysis (JSA).

The study was approved by the institutional Ethical Board of the Faculty of Public Health, Universitas Airlangga Surabaya and the number of ethics certificate is 154/KEPK year 2019.

Hazard Identification

The hazard identification technique used in this study is the Hazard Identification Risk Assessment Determining Control (HIRADC) method, through interviews and observation. Interviews were conducted by asking the opinions of all workers (6 workers) on print checking of plastic sacks, Health Safety Environment (HSE) section and the heads

Table 1. Frequency Categories (F)

Categories	Descriptive
5	Likely, frequently occurred in several times or more, More than once in one month
4	Possible, the event often occur, Once every a month
3	Unlikely, The event does occur from time to time, Once every one until two years
2	Rare, sometimes heard of this occurring, Once every three years
1	Very rare, never heard of this occurring, Once every ten years

Source : Australia Standards/New Zealand Standards (2009)

of the Roll to Roll unit. In addition, it was also carried out by looking at the accident data which was obtained from observations on how workers work and also the work equipment. Hazard identification focuses on sources of danger that originate from humans and equipment. The observed equipment was a machine that has been operating since 15 years ago. Based on interview results, the production capacity for 1 machine is 4000 to 5000 sacks per hour and there were 3 same-type machines in the unit.

Risk Analysis

Risk analysis used semi-quantitative analysis techniques. Risk analysis was carried out to determine the risk of each hazard. Each hazard in the Roll to Roll unit is analyzed based on interviews, accidents data, and direct observation. If the accident data is not recorded or not recorded, then the reference is the opinion of the head of department, HSE, and workers. If their opinions differ from one another, then the expert opinion, HSE, is used as a reference. They are considered most aware of the danger in the Roll to Roll unit. The observation was carried out to measure how the workers work and also the state of the equipment. Risk analysis used

Table 2. Consequence Categories (C)

Categories	Descriptive
5	Severe, more than 1 case of permanent disability or death
4	Major, serious injury or 1 case of permanent disability or death
3	Moderate, medical treatment needed, loss work hours ≥ 24 hours, and temporary disability
2	Minor, medical treatment needed that cause loss of work hours ≤ 24 hours
1	Negligible, first aid cases or medical treatment but do not loss of work hours

Source : Australia Standards/New Zealand Standards (2009)

Table 3. Risk Matrix

Frequency (F)	Consequence (C				
	1	2	3	4	5
5	5	10	15	20	25
4	4	8	12	16	20
3	3	6	9	12	15
2	2	4	6	8	10
1	1	2	3	4	5

Source: The University of Adelaide (2016)

Table 4. Risk Categories

Risk Rating (RR)	
Risk Value	**Information**
20 – 25	Extreme
10 – 16	High Risk
5 – 9	Medium Risk
1 – 4	Low Risk

Source: The University of Adelaide (2016)

risk matrix to determine the level of frequency and severity. Risk Analysis used categories of frequency and consequence determined by discussing with HSE team refer to Australia Standards/New Zealand Standards (2009) then used risk matrix to determine the level of risk categories.

Frequency and severity were recorded and analyzed using the risk matrix table. The results of the analysis show that hazards are categorized as low risk, moderate risk, high risk, and extreme risk.

Risk Evaluation

The risk evaluation variable used the As Low As Reasonably Practicable (ALARP) method. Risk evaluation was carried out to determine the level of a risk, whether it is accepted or not, whether it can be controlled or reduced, so that it can prevent work accidents. The results of the risk evaluation are used to determine control priorities. The higher the risk level, the more it will become the priority to be controlled. The As Low As Reasonably Practicable (ALARP) concept explains that every risk value, if possible, is reduced to the level of acceptable risk or low risk category, so that the risk that gets priority control is the one on the level of extreme, high, and moderate category (Australia Standards/New Zealand Standards, 2009).

Risk Control

After conducting a risk assessment, the next step was to determine the risk control in the Roll to Roll unit and to carry out a control assessment. All prioritized risks were treated to be acceptable risk by giving control efforts. Risk control is considered effective and efficient only if it is able to reduce the risk of existing hazards. It must be reasonable and doable by the company (As Low as Reasonably Practicable) or be useful for preventing workplace accidents. Control assessments using categories are presented in table 5 to find out how effective controls can reduce the risk.

Table 5. Categories of Control Effectiveness

Effectiveness	
Percentage	**Descriptive**
100%	Special, all control implemented perfectly
80%	Very good, good implemented but needed more attention by manager
75%	Well implemented, needed to improve worker's skill in implementing controls
65%	Implemented, but not all control implemented
50%	Half implemented, implemented about 50%
40%	Implemented by ≥25% - <50% for all control
25%	Implemented weakly, very rare implemented, about 15% - <25% from all control
15%	Understanding emerges, all workers understanding important of risk control in workplace, implemented about >0% - <15
0%	Not implemented

Source: Siswanto (2009)

Residual Risk

After control assessment, the next step was the calculation of residual risk. This is to estimate the remaining risks and assess the success of the taken control in the effort of reducing risks. The results of residual risk assessment can be used as an evaluation of the control and as an input for company for making changes of its policy related to occupational safety and health.

Residual risk assessment uses the following formula:

$$\frac{\text{Residual}}{\text{Risk}} = \frac{(100\% - \%\text{Control Assessment})}{100\%} \times \frac{\text{Risk}}{\text{Ratio}}$$

RESULT

The remaining risk assessment is then carried out to determine the remaining risks after the control has been carried out. The following is a table of results of hazard identification, risk analysis, risk evaluation, control assessment, and residual risk assessment in printing checking activities on the sack stamping.

The results of the risk analysis show 2 hazards in the low risk category, 2 hazards in the medium risk category, and 2 hazards in the high risk category. The risk evaluation of hazards shows that medium and high category risks fell in the category of unacceptable risk. The control assessment resulted in

Table 6. Results of Risk Assessment, Control Assessment, and Residual Risk on Printing Check of Plastic Sacks Production in Sidoarjo Indonesia 2019

Sources of Hazard Activities	Hazard	Risk	Risk assessment			Control Assessment	Residual Risk
			F	C	RR		
Low focus in checking	Hair rolled in the machine	Cut, the scalp is torn.	3	3	9 (medium risk)	65%	4 (low risk)
Cleaning the dirt stuck in the machine	Pinched by the printing machine	Cut, torn wounds, broken bones.	4	4	16 (High risk)	25%	12 (high risk)
Cleaning oil in the printing machine	Slipped by the oil droplets	Bruises, scratches.	1	2	2 (low risk)	No control Assessment	No residual risk assessment
	Finger pinched by the machine gear.	Cut, torn wounds, broken bones.	4	4	16 (high risk)	25%	12 (high risk)
The distance between machines for checking is too narrow	Hit the machine	Bruises, scratches, cuts, tears.	2	3	6 (medium risk)	40%	4 (low risk)
Cable and hose are not neat	Feet tripping	Bruises, scratches.	2	2	4 (low risk)	no control assessment	No residual risk assessment

the finding that the risk categories of some hazards could be lowered. However, some risks remained even though controls were carried out. Control has not been able to reduce the risk category to be lower. Remaining risk shows the effectiveness of the control resulting in the residual risk value shown in table 6.

DISCUSSION

All activities carried out at the factory have various potential safety hazards. Mechanical hazards pose a risk of trauma and injury from accidents. Mechanical hazards include bumps, punctures, cuts, pinches, pressures, falls, slips, burns. It poses a risk of injury, bleeding, fractures, and even death (Kurniawidjaja, 2010). This assessment refers to the risk assessment method according to the Australia Standards/New Zealand Standards (2009) approach, namely the semi-quantitative risk assessment analysis. The results of the risk analysis indicated that a number of hazards still produced risks on high categories and medium categories. Hazard identification had indeed been carried out by OSH officers of the company, but they never carried out risk assessment which includes risk analysis and risk evaluation before. Risk evaluation aims to find out whether the risk is acceptable or not. Based on the ALARP concept, the risk in unacceptable risk category must be reduced to a low category or

in the tolerated category, if further control cannot be performed (Ramli, 2010). The ALARP concept explains that tolerable risk is undesirable risk but it is accepted with a condition of strategies and steps for risk reduction are no longer practically feasible (Ramli, 2010).

Based on interviews with respondents, a number of controls can still be carried out to reduce existing risks into acceptable risk. Considering the benefits it offers, the company had agreed to provide the funds to cover the cost of carrying the practical control. Risks that fall into the low risk category, based on the ALARP concept, can be categorized as acceptable risk. Risks in the low category is considered to have very small possibility or almost impossible to be reduced. If further control is carried out, the risk will be more costly and time-consuming without bringing greater benefits Australia Standards/New Zealand Standards (2009) In accordance with the ALARP concept, the risk evaluation process does not only see that the risk can still be controlled practically, but can benefit profitably from the costs incurred (Ramli, 2010).

Risk control must be applied to high risk and moderate risk hazards. Based on the ALARP concept, these two categories are not acceptable and still require controls in order to reduce the risk of being accepted and cause very minor harm to workers.

High category risks must be prioritized by the company prior to controlling other lower hazards. High category risks are intolerable and have a greater impact on work processes and on workers. These intolerable risks need to be eliminated or reduced into two other categories, namely tolerable risk and acceptable risk (Civil Aviation Safety Authority, 2012). A number of safety requirements as preventive and mitigation measures are put in place to control risk to acceptable levels (Australia Standards/New Zealand Standards, 2009).

Medium risk had been controlled by the company but not optimal. The taken control measures were in the form of administrative controls and PPE. Decision making on risk categories can be changed at any time depending on the situation, such as additional controls, the evaluation method and the assessors' perception. How an assessor views and decides the risk category is not static. It is often associated with risk perception (Paek and Hove, 2017)

Risk control is quite effective in reducing risk. It was proven after controlling by a number of high and moderate categories risks changed into lower risk categories, even though some were still in the same category. Although some risks decreased, the implementation of controls still needs to be improved as there are still many shortcomings in their implementation. Residual risk is needed to determine the effective and efficient implementation of controls in reducing risk.

Hair to be Rolled Up by the Machine

A low focus on printing checks can pose a danger like an incident of hair rolled in the machine that bear the risk of being cut and tearing the scalp. The results of interviews and accident data indicate that there has never been an accident. However, the results of observations prove that it is very possible for accidents in the form of hair to be rolled on the machine. The results of the interview by asking for an opinion were proven by observations obtained information that if an event occurred then the worst possibility of serious injuries to workers would require medical care and loss of working days starting from 1 week to 2 months or more. However, this accident does not cause permanent disability. The results indicate that controls are needed to reduce risk.

Research Wulandari and Widajati (2017) states that physical and mechanical hazards are the main source of accidents in the shipyard industry, so risk control useful to protect worker from hazard in workplace. Control carried out included inspections but the implementation was not optimal. There has been no documentation of the results of the inspection. Sanctions given are verbal reprimand. PPE in the form of a hair protector (hair cup) was also not optimal as it did not pay attention to the type. According to PER. 08/MEN/VII/2010 concerning Personal Protective Equipment Article 4 paragraph 1 PPE must be used in workplaces where machinery, aircraft, equipment, equipment or dangerous installations are made, tried, used or used and can cause accidents, fires, or explosions (Minister of Manpower Regulation, 2010).

According to the Minister of Manpower Republic of Indonesia Regulation No. PER.08 / MEN / VII / 2010 article 7 paragraph 1 states that employers or executives are required must to carry out PPE management in the workplace (Minister of Manpower Regulation, 2010). Based on interviews and proven by observation, some workers wear hair cups and some also wear ordinary hats. The hair cup covers the entire hair, while the cap only covers part of the hair. Control assessment is 65%. The results of the calculation of residual risk found that the control carried out was able to reduce the level of risk from the initial risk level, the moderate risk category with a value of 9, to the low risk category with a value of 4. Study from Purbayanti and Hidayat (2018) states that risk control in PT.X able to reduce the risk on the job aircraft paint removal.

Stuck in the Machine

Pinned by a printing machine during the printing process may happen due to direct hand contact with a rotating machine when cleaning the machine. Finger pinched by machine gear due to oil top up may happen due to the absence of protective equipment and close distance with the gear machine. Insecurity may arise because dangerous equipment has the potential for workplace accidents (Gunawan et al., 2016). The risk of pinching causes a torn wound and broken bones.

The results of the interview and observation to the accident data showed that the most frequent work accident was worker hand pinched on the machine, which is as much as 2 times a month. The results of the interview, by asking for subject opinions, showed that frequent pinched events occur more than once a month. This was also proven by the observation result. The interview results informed that, in the event of an accident, the workers whose

hand pinched on the machine get work leave with the limit of being fully recovered or no longer needing health control, visiting health services.

Risk analysis resulted in high risk category with a value of 16. The frequency of non-occurrences that continue has a value 4. The severity of the incident allows permanent and missing injuries of 2-3 months working day with a value of 4. The results of the risk evaluation found that this was intolerable categories risk and it needed control so that the risk of this kind accident can be lowered into lower categories.

A hand pinched by a machine is a danger. The activity of cleaning dirt on a printing machine had special rules, such as to maintain distance, not to get too close to the printing machine, and to turn the engine off when doing the cleaning. Control in the form of inspection was not optimal. The results of the interviews which proven by observations showed that no workers were wearing gloves when working. Workers know the importance of gloves for protection, but for reasons of being not comfortable, workers do not want to wear gloves. The company had issued rules regarding the use of gloves and also the procurement of PPE, in the form of gloves, during working time. However, the monitoring of employee compliance had not been optimal. The control of this work accident was scored to be 25% as it was a very weak in implementation. There are no real actions taken in implementing controls. The results of the control assessment are then used to calculate residual risk. According to PER. 08/MEN/ VII/ 2010 concerning personal protective equipment, gloves are one of the PPE that must be used for high-risk work to injure workers' hands such as machine-related work (Minister of Manpower Regulation, 2010). PPE for reduce risk from pinched is use of leather type of safety gloves be coated chromium metal (Martino, Rinawati and Rumita, 2015). Research Mallapiang and Samosir (2014) said that recommended control in station and nut kernels to reduce the risk of injury is administrative control by making work safe procedure and using PPE consist safety gloves. Pinched hazard the effect of low focus can cause risk of injury, and can be reduced by control PPE and training, beside that control PPE and training get a value 90% so that effectiveness to reduce of risk (Zeinda and Hidayat, 2016).

Residual risk was obtained after controlling. However, this has not been able to reduce risk into a lower category (Minister of Manpower Regulation, 2010). The initial risk was 16 which fell into high

category. After the control was carried out the value dropped to 12 which fell into high category.

Slip Due to Oil Droplets

The danger of slipping on printing checks can occur when oil is topped up to a machine where oil drips onto the floor causing the risk of bruising and scratches. Slipping was mostly caused by workers as they loss their focus when carrying materials. Slipping has the risk of bruising and blisters. Research Kurniawati, Sugiono and Yuniarti (2014) mentions that hazard of slipping due to wet floor contact with water mixed with oil can cause work accident, so needed awareness worker about environmental hygiene to minimized work accident. Research from Zeinda and Hidayat (2016) explained that risk to hazard slipped from droplets of oil can be reduced by the control of cleaning the floor and use of safety shoes, get effectiveness control 75 percent with the residual risk 1 belongs to low risk category. In other research by Mallapiang and Samosir (2014) said that risk control to reduce slip due to oil droplets is using PPE consist safety shoes. The results of interviews and by looking at accident data indicated that the risk of the slip hazard has never happened. However, it is proven by observation that it is possible to slip due to the condition of the ceramic floor. The interview results by asking for opinions and proven by observations showed that slipping can endanger the safety of workers. Slipping causes a minor injury, so it requires first aid and causes worker to loss some weekdays from 1 week or less.

Risk analysis scored 2 and fell in the low risk category. The frequency of events was very rare and almost never occurs and resulted in a value of 1. Severity received a value of 2 for it caused minor injury that needs first aid. The hazard of slipping can be prevented by wearing anti slip shoes when doing work (Ihsan, Edwin and Irawan, 2016). Risks from slip hazards are acceptable risk in the ALARP concept, so no control assessment and no residual risk assessment in this study.

Hit the Engine

Engine bumps occur because the distance between the engines is too narrow and causes the risk of bruising, abrasions, cuts and tears. Check printing is done by checking the cliche place or stamp pattern making film that is done every approximately 1 hour. The results of the interviews

by looking at the accident data showed that the risks from these hazards occur most often once in a year. Risk analysis resulted in a value of 6 which fell in the medium risk category. Frequency was rare but it is possible to occur and gained a score of 2. Severity scored 3 as causing severe injury that it needs medical treatment but does not cause permanent disability. The results of the risk evaluation on printing checks indicated that it was in unacceptable risk categories, so risk control was needed in order to reduce the level of risk.

The applied risk controls include inspections yet implementation was not optimal. PPE in the operation forklift is the use of helmet, gloves, and safety shoes to reduce risk of injury so the effective protect (Martino, Rinawati and Rumita, 2015). The results of the interview asked for subject opinion and were proven by observations showed that workers did not wear gloves when working due to reasons of discomfort. There were some workers who use safety shoes, but most of worker found to use regular shoes. The results of the risk control assessment get a score of 40%. The residual risk calculation showed that the control measures taken can reduce the level of hazard risk from moderate risk with a value of 6 to a low risk with a value of 4. Control can be further improved by conducting routine and scheduled inspections, conducting safety talk before work and educating workers on the importance of using PPE. According to (Tarwaka, 2017) Inspection is the best way to find problems and assess the risks before work losses or accidents and occupational diseases actually occur. According to the (Suma'mur, 2014), the PPE used must be able to provide effective protection against various hazards. Research Alayyannur and Nilamsari (2016) state that work accident occur every year can caused not using PPE when work activities.

Feet Tripping

The danger of tripping occurs because untidy cables and tubes cause the risk of bruising and scratches. Workplace has an important role to health and safety labor. Good workplace is a safe workplace. Pleasant and harmonious working environment will support the safety (Ramli, 2010). 5R program to eliminate waste can be minimized so there has increased productivity and effectiveness of a company (Osada, 2011). The practice of 5R (Ringkas, Rapi, Resik, Rawat, Rajin) and use of safety shoes on work activity can reduce the risk cable tripping hazard (Agustina and Mulyono,

2017). House keeping has introduced by hiroyuki hirano with the concept of 5S (seiri, seiton, seiso, seiketsu, shitsuke) in 1980 in japan (International Trade Center, 2012). Risk analysis resulted in a value of 4 and fell in the low risk category. The frequency of events was zero or rare that it gained a value of 2. Severity that causes minor injury and requires first is given the value of 2. The risk of tripping hazards is acceptable risk in the ALARP concept, then no control assessment and residual risk assessment in this study.

CONCLUSION

Risk management on print checking of plastic sacks production in Sidoarjo Indonesia has not been optimally implemented, so needs to be improved. Hazard identification in the activity of print checking activities on the production of stamping stage of plastic sacks in Sidoarjo, Indonesia resulted in 6 dangers from 5 sources of danger. Risk assessment produced 2 low category hazards, 2 medium category hazards, and 2 high category hazards. Based on the results of the evaluation, medium and high categories belong to unacceptable risk and need controls to reduce risk. The control applied in the form of inspection and PPE, yet the application was not optimal. Residual risk after control resulted in 4 low risk hazards and 2 hazards remained in the high risk category.

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