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# Hazard Identification and Risk Assessment in Paper Industry

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**ABSTRACT --** In the paper industry, company produces papers with different sizes and shapes. The Risk Assessment and Hazard analysis is done in Paper Production Company producing cigarette paper. In production process, there are different machines and equipment that are operated by the workers. There are a lot of potential hazards to the workers in the workplace and can cause injury to the workers. Hazard identification and risk assessment are done to reduce the hazards and to increase occupational health and industrial safety. By Hazard identification and risk assessment is one a safety and health management. It is use to analysis the risk levels by the criteria and the probability of the accidents during the running production process. Risk Assessment Code (RAC) for each potential hazard, and for a 3 extreme risks, like 12 high risks, 6 medium risks and 3 low risks are tabulated. We have successfully identified potential hazard using the tool.

**KEYWORDS:** Risk Assessment, Hazard Analysis, Occupational health and safety, Risk Assessment Code (RAC)

## I. INTRODUCTION

Risk management is now the main thing in conversation, practice, as well as job training. This clearly demonstrates the importance of risk management in the comfort of working at the present time. Management policies in the field of occupational safety and health companies, including Risk Management policies that relate to risk anticipation, risk evaluation and risk management in the workplace.

Protection of labor safety is very important because of many potential hazards in the workplace. Related problems of labor protection, the company implemented a management system that can protect workers from occupational accidents and avoid substantial losses to the company. The implementation of safety management systems and occupational health consists of many programs to protect and welfare workers.

Research in India has been discussed about the potential hazards in the Thermal Power Plant power in 2014 [1]. In addition, the potential danger has also been discussed for workers at the foundry in a company in India [2]. Past research has also discussed the potential hazards to workers in the construction sector [3]. In Indonesia, the research about potential harm has been done in Makassar, Sulawesi [4]. However, potential hazards may occur, especially company that produces cigarette paper in North Sumatra have not been discussed before. Companies of cigarettes paper using machinery and equipment that has great possibilities in causing injuries to workers. Accidents that occurred can be caused by the negligence of workers when operating the machinery and equipment or because of the surrounding work environment. Potential hazards that occurred often are defects in the operation, the state of slippery floors and work is less cautious.

The study was conducted using the method of HIRA (Hazard Identification and Risk Assessment) to identify potential hazards found in the workplace. By identifying potential hazards and risks of work, is expected to facilitate the company in the management and control of workplace safety and minimize the chances of accidents.

## II. RESEARCH METHODS

To identify hazards that may occur should move as a whole in a system. The application of hazard identification is done for all components. All potential hazards and incidents that are identified must be stored in some way. Here are some of the methods used in determining the hazard identification, such as data usage and condition of the equipment to see potential hazards, any deviation draft or critical user parameter, operations of routine and non-routine like start-up,

shutdown, or process upsets and development, also implementation or maintenance activities that can contribute to potential danger or accident.

Some stages are involved in the management of the potential hazards are identifying potential hazards, determining the level of significance, controlling the potential for significant harm through the process of elimination, substitution, isolation or minimization and educating the operator by giving a training based on the collection of potential hazards in which activity in the industry.

The management system contains the potential dangers. They are the systematic process to identify potential hazards in the workplace, the systematic process to identify potential new hazards in the workplace, the systematic process to review potential hazards to determine the level of significance and the level of control and process to ensure that the control options in the workplace is not enough merely adequate but should be in accordance with industry standards.

### III. RESULTS AND DISCUSSIONS

#### a. Category of Hazards Resources

Data of Hazards Resources obtained then being categorized by Risk Assessment Approach. The categorism of hazards resources defined by the rank of *severity*, *probability*, and *probability*.

The rank of each category is consist of five ranks. Category of severity is ranked by number, the bigger number the worse, such as 5 is disaster, 4 is big, 3 is medium, 2 is small, and 1 is not meaningful. Results of defining the rank of *severity* is written in Table 1.

Table 1. Rank of Severity

No.	Activities	Potential Hazard	Effect	Category of Severity	Explanation
1.	Removal or appointment of Jumbo Roll using Crane	Squashed, crushed	Death, broken bones, cuts, Bruises	5	Cause of death, material loss is huge, going 1 events in more than 1 year
2.	Displacement jumbo roll using a forklift	Trampled, crushed	Death, fractures, abrasions, cuts	5	Cause of death, material loss is very large, one incident occurred in more than 1 year
3.	Splicing or disconnection of the electric machine	Fire, shock	Death, burns	5	Cause of death, material loss is very large, one incident occurred in more than 1 year
4.	Cleaning machines ream cutter	Cut blade, dust	Injuries, respiratory problems	4	Injury resulting in disability or lost total body function, great material loss, one incident occurred within 1 month
5.	Transfer of finished products to the warehouse using a forklift	Trampled, crushed	Death, fractures, abrasions, cuts	5	Causes death, material loss is very large, one incident occurred in more than 1 year

Table 1 shows the rank of severity from activities that cause potential hazards and give effect to workers. On the other hand, category of probability is ranked by letter, such as, A is almost certainly will happened, B is tends to occur, C is may occur, D is less likely, and E is rarely disaster. The rank of *probability* is written in Table 2.

Table 2. Rank of Probability

No.	Activities	Potential Hazard	Effect	Category of Probability	Explanation
1.	The working process associated slitter machine bobbin	The noise, the room temperature increased	Fatigue, lack of concentration, impaired hearing	A	No injuries, material losses are very small, occur in nearly all circumstances, happen one time in a week
2.	splicing of paper	Cut, exposed to heat dryer	Blisters, burns	B	Lost workdays, require medical care, loss of material large enough, happened 1 time in 1 month
3.	Cleaning and checking the machine bobbin slitter	Cut, crushed	Blisters, sores	B	Minor injuries, requiring treatment P3K, can be handled directly at the scene, the material loss was, happened 1 time in 1 month
4.	The process of cutting paper ream	Cut by knife	wound	B	Injury resulting in disability or lost total body function, great material loss, one incident occurred within 1 month
5.	Cleaning machines ream cutter	Cut blade, dust	Injuries, respiratory problems	B	Injury resulting in disability or lost total body function, great material loss, one incident occurred within 1 month

Table 2 shows the rank of probability from activities that cause potential hazards and give effect to workers.

*b. Determining Risk Assessment Code (RAC)*

Having obtained a value for the category of severity and probability, made the determination Risk Assessment Code (RAC) for each source of hazard. RAC consist of five, such as E is extremely risk, H is high risk, M is moderate risk, and L is low risk. Determining the value of RAC using Qualitative Risk Analysis Matrix is shown in Table 3.

**Table 3.** Risk Values for Each Source of Danger

No.	Activities	Potential of Hazard	Category of Severity	Category of Probability	RAC
1.	Removal or appointment of Jumbo Roll using Crane	Squashed, crushed	6	E	H
2.	Installation of cores on a bobbin	Crushed, pinched, hit	2	B	M
3.	Installation or setting bobbin slitter	Cut, crushed	2	D	L
4.	splicing of paper	Cut, exposed to heat dryer	2	B	H
5.	Cleaning and Checking the machine bobbin slitter	Cut, crushed	2	B	H
6.	The working process associated slitter bobbin machine	The noise, the room temperature increased	1	A	H
7.	Rolling the paper on a bobbin slitter Machine	Clothing entangled operator	2	E	L
8.	Transfer of the results to the bobbin pallet	Crushed, knocked	3	D	M
9.	Displacement jumbo roll using a forklift	Trampled, crushed	5	E	H
10.	Bobbin removal using a hand truck	Trampled, crushed	3	E	M
11.	Installation of jumbo roll to be cut	Havin equipment	3	D	M
12.	Installation or setting ream cutter	Crushed equipment, cut by knife	4	C	E
13.	Entry process into the path of the paper Ream	struck down	4	D	H
14.	The process of cutting paper ream	cut by knife	3	D	E
15.	Push or shift the cutting table	Error body position	3	D	M
16.	Splicing or disconnection of the electric Machine	Fire, shock	5	E	H
17.	Cleaning machines ream cutter	Cut by knife, dust	4	B	E
18.	Loading tide of brake plate	exposed to heat	4	D	H
19.	Transfer of the results ream to the sorting area using a hand truck	hit	3	E	M
20.	Ream of paper packaging results	Havin equipment	2	C	M
21.	Preparation of the results of the paper ream to the pallet	struck down	2	D	L
22.	Transfer of finished products to the warehouse using a forklift	Trampled, crushed	5	E	H
23.	Broke cores cut using a knife cutter	Cut	2	B	H

Table 3 indicate the risk value of each source of danger. It gives the code for risk assessment from low risk (L) to extremely risk (E).

Recapitulation of the risk value based on the results of data processing can be seen in Table 4.

**Table 4.** Recapitulation of the Risk Activity Value

No	Risk Value	Number of Activities
1	<i>extreme risk</i>	3
2	<i>high risk</i>	10
3	<i>moderate risk</i>	7
4	<i>low risk</i>	3

The results obtained showed that the category (high risk) is the risk category of the most commonly found in the production process at the factory. Based on these results, it is known that there are a lot of activities at high risk for occupational safety and health. So the company needs a variety of control measures to avoid potential hazards such as training health and safety, ensuring that all employees use personal protective equipment and make scheduling corrective actions as soon as possible.

#### IV. CONCLUSIONS

Value risk potential occupational hazards dominant in converting work station is a high risk category to overcome required training by management and scheduling improvement. The causes of potential hazards of work are workers who perform activities less cautious, noisy engine, narrow road conditions, high temperatures, and the negligence of workers in the use of protective self-equipment. Action of controlling performed to avoid potential hazards is by implementing the use of personal protective equipment such as gloves, safety shoes and ear plug, the machine checks periodically, a warning sign making, increase ventilation and operator training on a regular basis and the implementation of 5S concept.

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