



ACCIDENT RISK ANALYSIS USING HIRARC METHOD (HAZARD IDENTIFICATION RISK ASSESSMENT AND RISK CONTROL) AT PT. STARR PANEL INDUSTRY

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ABSTRACT

PT. Starr Panel Industri is a company that produces sandwich panel materials that are widely used by contractors and infrastructure activists. However, in the production process there is still manual work that can pose a risk of work accidents. Every activity has potential dangers, either due to negligence or lack of implementation of an occupational safety system. Therefore, the implementation of Occupational Safety and Health (K3) management is very important. K3 management is an effort to reduce the risk of accidents that can harm humans, the environment, and the company. The HIRARC method is used in this study as an approach to analyze the risks and directions of the implementation of K3. The results of the study show that this method is effective in assessing and reducing the level of occupational safety risks. Workers' attitudes also play an important role in the effectiveness of the implementation of K3. Factors that affect occupational safety include human factors, work standardization, and the environment work, infrastructure facilities such as personal protective equipment, and weather factors. This study advises companies to immediately establish policies or SOPs related to occupational safety and consider productivity variables for future research.



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1. Introduction

On era globalization Now development technology on moment This develop very rapid along with the development of time and human mindset. This is caused by human needs that continue to grow. increase will convenience technology Which There is, specifically in field manufacturing And industry (<http://kemenperin.go.id>). One of them is by using the "Sandwich Panel" material which is currently Enough in demand by for contractor, And for activist infrastructure other, because the amount the benefits that can be generated. In some building construction processes, usually this sandwich panel is used as a material for wall partitions and ceilings in certain areas. In the production process at the company there are still some jobs that are still manual in the process. Which may just in work the Can cause the occurrence risk accident Work. Because every job have risk the occurrence accident Which due to because negligence or Because lack of implementation in safety in work. So that it can cause accidents to workers. So

from that health And safety in Work must applied with Good And Correct so that no loss occurs workers and companies. One of the K3 management that applies globally or internationally is OHSAS 18001:2007. According to OHSAS 18001, K3 management is an effort to prevent the occurrence the risks involved in company activities that may result in injury on man, damage or disturbance to company. Management risk divided become three, namely Hazard Identification, Risk Assessment and Risk Control. Also known by the abbreviation HIRARC. This method is part of risk management and determines the direction implementation of K3 in company (Ramli, 2010). The Occupational Safety and Health Risk Management System is to develop and implement K3 For reach the results that effective in prevent accidents And effect other Which detrimental. Efforts implementation K3 in a way Good And Correct in accordance with regulations Which applicable For minimize accident Which happen in place work. In the implementation of the Management System Risk Occupational Safety and Health in In the field, there are many mistakes that cause losses to the company, yourself, or others. Safety And Health Work seems to be matter Which No Can underestimated in work whatever including regulation K3 in in company Because work safety close relation to workers' lives.

In the implementation of the occupational health and safety management system, there are things that are no less important. It is important to note that the facilities are complete for worker. Completeness of facilities plays a role very important in the implementation of the occupational health and safety management system because with existence facility that's good then Implementation of Risk Management Safety And Occupational Health Also walk with Good, so also on the contrary. Fact in field There is a number of workers who not enough care to implementation health And safety Work. Matter This potential cause an accident especially on worker field. Safety And Health Work (K3) Which No can be applied properly damage Management System Occupational Safety and Health Risks in related companies. In addition, the implementation of occupational safety and health must be monitored in order to reduce violations. Which harm company And worker. Awareness about importance K3 must always on aroused, reminded, and cultivated among workers. Understanding and implementation of K3 in the company very necessary, especially in terms of employment. This is related to management problems risk to accident Work, use minimize possibility the occurrence accident work, need socialized understanding And implementation K3 in a way Good And Correct. For That required occupational safety risk analysis to determine the level of occupational safety risk using the HIRARC (Hazard Identification, Risk Assessment and Risk Control) method at PT. Starr Panel Industri.

2. Review Literature

The First Research Titled "EVALUATION OF THE IMPLEMENTATION OF OCCUPATIONAL HEALTH AND SAFETY (K3) BASED ON SYSTEM MANAGEMENT K3 (SMK3) IN WORKSHOP ELECTRO AND INFORMATICS HALL EXERCISE EDUCATION TECHNIQUE (BLPT) YOGYAKARTA" by Gift Ratna Istiqlal Regarding How is the K3 management system in the BLPT Electrical and Informatics workshop and How is the implementation of K3 based on the K3 management system in the BLPT Electrical and Informatics workshop .

Study Second Titled "SAFETY AND HEALTH WORK (K3) ON CONSTRUCTION PROJECTS IN BANDUNG CITY" by ERNI KURNIAWATI Regarding How to implement the Occupational Safety and Health (K3) program in construction projects in Bandung City and the obstacles that occur in implementing Occupational Safety and Health (K3) in construction projects in Bandung City .

The Third Research Entitled "ANALYSIS OF OCCUPATIONAL SAFETY AND HEALTH (K3) LEVELS OF CONSTRUCTION PROJECTS TOWARDS K3 RISKS AND MANAGEMENT (CASE STUDY: TERMINAL II CONSTRUCTION PROJECT, RADIN INTEN II AIRPORT, AIRPORT PARKING BUILDING RADIN INTEN II AND SHOWROOM AUTO 2000 (SOEKARNO-HATTA)" by AYUMA ERSAMAYORI MILEN About About What is it all Which become factor accident work and how to apply K3 management procedures to the

study objects of the Radin Inten II Airport Terminal II construction project, the Radin Inten II Airport parking building and the Soekarno-Hatta Auto 2000 showroom.

Study Fourth Titled "ANALYSIS RISK SAFETY AND HEALTH WORK ACTIVITIES DEMOLISH LOAD FERTILIZER" by Rian Muhammad, Willy Tambunan, Lina Abused by Fatimahhayati About How activity demolition And loading goods own potential accident Work tall Which done on area Harbor Dock Which operate in East Kalimantan as well as What just control risk Which must done For give direction K3 in activities demolish load in area Harbor Dock Which operate in Kalimantan East .

Fifth Research Titled "ANALYSIS RISK HEALTH AND SAFETY WORK ON "MILL BOILER DIVISION WORKERS (Case Study at PT Laju Perdana Indah PG Pakis Baru, Pati)" by Hutami Nuke Ardani, Hryo Santoso, Rani Rumita About How management management health risks And safety Work Which Good Which referring to on division mill boiler on PT. Rate Prime Beautiful PG Fern New, Starch Study Sixth Titled "ANALYSIS RISK SAFETY WORK WITH METHOD HIRARC ON PROCESS PRODUCTION KNOW IN UKM SOURCE SUSTENANCE" by Syamsul Arifin and Abdul Wakhid on How analysis and efforts can be made so that work safety risks can be carried out in the tofu production process at UKM Sumber Rezeki using the HIRARC method.

Foundation Theory

Safety And Health Work

According to ILO/WHO (1998) Occupational Safety and Health (K3) is a promotion, protection and improvement of the highest level of health covering physical, mental and social aspects for the welfare of all workers in all workplaces. The implementation of K3 is one form efforts to create the workplace that equal, healthy, free from environmental pollution, so that it can reduce and/or be free from work accidents and work-related diseases which can ultimately increase work efficiency and productivity. Safety And Health Work (K3) is Wrong One effort or form business Which must carried out by workers in carrying out work, whether originating from the individual themselves or the work environment, to obtain a guarantee of Occupational Safety and Health (K3) which aims to ensure that the work carried out does not threaten and endanger them. Furthermore, implementation K3 is a form effort For create place Work which is safe, healthy, free from environmental pollution, so that it can reduce and/or be free from work accidents and work-related diseases which can ultimately increase work efficiency and productivity (Syamsul Arifin and Abdul Wakhid, 2018).

Accident Work Consequences

According to Suma'mur (1995), the definition of an accident is an unexpected and unwanted event. It is said No unexpected Because behind incident Which happen No there is element of intent or element of planning, whereas it is not expected because the accident is accompanied by material losses or causes suffering on the greatest scale light to the most severe scale. Work-related accidents are accidents that occur in employment relationships or while doing work in a workplace. The scope of work-related accidents is sometimes expanded to include work accidents that occur while traveling to and from work. According to Bird and Germain, FJ (1990) work accidents are unexpected events that result in pain (injury or loss of life) to people, damage to property and losses in the process that occurs when work is carried out. Work accidents usually happen Because existence contact with material or source energy (material chemistry, temperature height, noise, machines, electricity, etc.) above the threshold value of the human body's ability to withstand accept it, Which possibility can cause cut off, burnt, wound abrasions, broken bones, and disruption of physiological functions of body organs.

HIRARC (Hazard Identification, Risk Assessment and Risk Control)

HIRARC (Hazard Identification, Risk Assessment and Risk Control) is a series of processes to identify hazards that can occur in routine or non-routine activities in the company, then conduct a risk assessment of the hazard and then create a hazard control program so that the risk level can be minimized to a lower level with the aim of preventing accidents. Implementation of K3 begins with good planning including hazard identification, risk assessment and control

which are part of risk management. This is HIRARC which determines the direction of K3 implementation in the company. HIRARC starts from determining the type of work activity which is then identified as a source of danger so that the risk is obtained. Then a risk assessment and risk control will be carried out to reduce exposure to hazards in each type of work.

Framework Thought

This study is a qualitative study to determine the analysis of worker safety risks working at PT. Starr Panel Industri. In this study, the HIRARC method was used, starting from how to identify risks, how to analyze risks to risk control. This study began by looking at investigation data from PT. Starr Panel Industri and conducting interviews with the relevant informants to find the scope and stages of the process. Work as well as make A questionnaire Which shared to employee PT. Starr Pnael Industry.

3. Methodology

This research is an evaluation study using a qualitative approach aimed at get information about risk safety worker Which Work on PT. Starr Panel The industry is then compared with the results of observations by researchers to determine the level of occupational safety risk, using the HIRARC method which begins with identifying risks, how to assess risks to risk control.

4. Results and Discussion

Program Health And Safety Work (K3)

Program Health And Safety Work (K3) Based on results study Which has carried out at PT. Starr Panel Industri, the occupational health and safety program is already running. The program health And safety Work (K3) Which There is on company covering training safety, work environment control, supervision and discipline, occupational safety publications, and improvement awareness health And safety Work (K3). Objective from existence program health and safety Work (K3) as training safety Which can give knowledge knowledge to all employees working at PT. Starr Panel Industri so that when working they are able and moreover master and understand the work to be done and avoid unwanted incidents. For example accident Work Which will harm employee and party company itself. In addition, the company also ensures that all employees have received comprehensive training with the aim that the occupational health and safety (K3) program can be implemented properly.

Occupational safety publications at PT. Starr Panel Industri include the installation of safety signs. danger work, method usage tool protector self Which on display in every corner room work, the dangers of smoking, how to use equipment correctly and safely, and there are safety messages in each workspace that are intended to be observed by employees while working. With the existence of occupational safety publications, it is expected that employees will pay attention to safety while working which has an impact on the health level of each individual. Supervision is carried out by the Factory Manager to his subordinates, review And see in a way direct performance employee. If in doing work employee No fulfil standard Work moreover results Which produced No satisfying, then the employee will be given a warning. Then violating the work procedures will be given a warning letter Which customized with levels violation from SP 1 until SP 3. Improvement Occupational health and safety (K3) awareness in companies starts from the lowest level to the highest level.

The low level starts with the employee's personal, such as the use of personal protective equipment while working, so that employees are aware of their health. The highest level is that the company involves each employee to provide input related to increasing health and safety awareness, because the results of this input are used as decisions to create programs that are appropriate for their employees. The company's work environment control is carried out directly by superiors, so that a conducive environment can be achieved. Companies often do control in a way routine. Matter Which often done checking is checking tool Personal protective equipment ranging from masks, earplugs, safety shoes, and glasses are carried out periodically. If the stock is

approaching a critical point, an order should be made immediately one month before the stock runs out to suppliers. Except for safety shoes conducted annually. The company does not ever done activity sport in a way routine, activity done in a way individual And checking The health of each employee is only implemented if there is a claim from the employee.

Factor – factor Reason The occurrence Risk Accident Work

A. Factor Man (Human Error)

1. Ignorance in moving materials, and equipment requires sufficient knowledge by technicians. If the technician lacks knowledge, it can be a trigger for accidents. Knowledge from technician in installation material or use equipment work, understand the character of the material, and so on. This is very important, if it is careless, it will also endanger the quality of the material, equipment and the human itself.
2. Lack of skills regarding panel installation, then technicians need continuous training so that skills are getting better. This is to improve skills, to minimize errors in work, and reduce the number of work accidents.

B. Standardization

1. Not yet existence regulation or standardization that discuss about each work panel installation and panel management.
2. The amount worker Which No notice Instructions safety And health Work And risks that may occur.
3. Not enough knowledge about danger Which There is around and Which Again in do it

C. Environment Work

1. Panel is material standard building Which heavy And side wide panel Because remainder piece still sharp plate
2. Moment demolish goods Which No safety, in a hurry, No in accordance priority Which done
3. Cutting panel, aluminum And accessories other No on place Which in accordance
4. Placement mastic sealant And silicon Which not enough Correct cause air around contaminated work environment Completeness tool protector self Which not enough adequate so that worker must extra Be careful
5. Noise machine continuous, boiler And dust collector Which currently operate cause the worker's hearing to be impaired
6. Unrest inhabitant around Which a number of time throw rock, bottle glass from outside factory fence
7. The existence of material chemistry dangerous that is ISO, POLY, Cyclopentane And Catalyst Which easy explosion, fire and radiation.
8. Material dangerous chemicals Can cause irritation caught eye or skin in a way direct
9. Respiratory disorders due to inhaled PU particles, shortness of breath, long-term health problems
10. Possibility risk Which Can happen moment process development Which in cause by panel namely broken bones, being hit by panel sheets during lifting or installation, bleeding wounds due to plate Which sharp, irritation eye moment cutting panel, foot And hand often scratched until it is deep enough to need stitching

Incident Accident Work

The incidents of work accidents that have occurred were obtained from information from trusted informants. Data taken within a period of 3 months at PT. Starr Panel Industri.

Tabel 4.2 Data Accident Work

NO	CASE INCIDENT ACCIDENT	PERIOD		
		MAY	JUNE	JULY
1	Scratched Plate	4	-	2

2	Hit by Goods	-	2	1
3	Caught Chemical	1	3	1
4	Slipped	1	-	1
5	Fall from the height	2	-	-
6	Caught welding sparks	-	1	-
7	Scratched machine cutter	1	-	-

Source : PT. Starr Panel Industry

Results Identification HIRARC on PT. Starr Panel Industry

Results identification on PT. Starr Panel Industry there is results that level risk Which happen is still relatively high and at the same time shows that occupational health and safety management is taking place Not yet in do in a way maximum. Following results HIRARC Which There is on PT. Starr Panel The industries are as follows:

Table 4.7 HIRARC Calculation

Activity Name	Type Accident Work	Causes of Accidents	Risk or Impact	Possibility	Consequence	WRAC	Risk Level
Production	Fallen	Environment Work	Stretch Muscle / Tendon	4	3	12	Conditional at
Production	Contact With Hazardous Materials Or Radiation	Ingredients Or Radiation Substances	Wound On the surface	5	4	23	Tall
Production	Bumped (Scratched, Cut, Stabbed)	Environment Work	Wound On the surface	5	3	18	Strict
Production	Excessive Movements Ability	Environment Work	Scratched	5	2	12	Conditional at
Delivery	Hit by Object	Environment Work	Bruise And Deep Wound Others	5	2	5	Low
Production	Hit by Object	Ingredients Or Radiation Substances	Bruise And Deep Wound Others	5	2	20	Strict

Production	Stuck By Object	Machine	Stretch Muscle / Tendon	2	3	12	Conditional at
Production	Contact With Ingredients- Material Dangerous Or Radiation	Machine	Wound In Surface	1	3	18	Strict
Maintenance	Stuck By Object	Machine	Wound On the surface	1	3	7	Low
Delivery	Bumped (Scratched, Cut, Stabbed)	Tool Transport / Lifting Equipment	Wound On the surface	5	4	22	Strict
Production	Bumped (Scratched, Cut, Stabbed)	Machine	Bruise And Deep Wound Others	5	3	15	Conditional at
Maintenance	Caught Electric current	Electrical Equipment	Wound Outside	1	4	23	Tall
Maintenance	Influence High Temperature	Electrical Equipment	Stretch Muscle / Tendon	1	3	23	Tall

5. Conclusion

Based on results study Which has done For test Influence Health And Work safety To Performance Employees at PT Starr Panel Industri in Pasuruan Regency, it can be concluded that:

1. Attitude worker very influential to implementation health And safety Work on when a work accident occurs .
2. Health And Safety Work in Work used For protect And ensure occupational safety and health .
3. The implementation of risk management is influenced by the working environment conditions which are the attitudes of workers, personal protective equipment and standardized rules, the following is an explanation:
 - a) Attitude worker Which negative influential to accident safety And health Work on PT Starr Panel Industri in Pasuruan Regency. This means that the lower the worker's attitude towards risks, the higher the work accidents that occur.
 - b) Personal protective equipment does not have much influence on the risk of work accidents at PT Starr Panel Industri because personal protective equipment is available but its appropriateness is not considered or is inadequate, so work accidents are still high.

- c) Standardization rules are very influential to risk of accident Work on PT Starr Panel Industri due to lack of employee concern for the applicable K3 SOP. Occupational safety and health supervision does not have much influence on the risk of work accidents at PT Starr Panel Industri because many workers do not pay attention to work instructions.
4. Occupational Health and Safety can minimize the possibility of work accidents among workers.

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