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SAFETY APPLICATION AND HEALTH WORK (K3) AT DEPARTMENT OF CNC LATHE USING HAZARD IDENTIFICATION RISK ASSESSMENT AND RISK CONTROL (HIRARC) METHOD (CASE STUDY OF PT. SWADAYA GRAHA)

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ABSTRACT
Work accidents have the ability to cause the formation of every work activity. Aspects of work accidents can be caused by machines or aspects of worker negligence. The comfort of workers is highly dependent on the situation and the industrial area. One of the markers that need to be observed is occupational safety and health. So that the industry applies the K3 listed on PT Swadaya Graha which is currently still in a non-HIRARC condition as a basis for mitigation. The HIRARC procedure finds a procedure that starts to ensure the activity after which the source of the hazard is identified, risk assessment, and control over that exists and has the aim of remembering the level of risk associated with a place. From that case, the author thinks it is necessary to carry out an OHS risk assessment using the HIRARC procedure by carrying out research that aims to find out how to analyze the capabilities of hazards that can be carried out and their control on a cnc lathe machine at PT Swadaya Graha. The procedure used is the HIRARC (Hazard Identification Risk Assessment and Risk control) approach. The results of this research are that there are 5 work disaster hazard capabilities in the Ministry of CNC BUBUT. After that this research shows there is no. 1. extreme type of hazard. risk, and 1 high risk and 3 medium risk. The most common hazard abilities occur because of the lack of PPE and the undisciplined workers and not exploring work SOPs. Therefore, it is necessary to try socialization and continue to emphasize through daily safety briefings and safety signs.
Keywords : *occupational safety and health, risk, hazard, HIRARC*

1. Introduction

The occupational safety and health management system itself is an effort to identify occupational risks or hazards so that work risks can be improved or reduced by existing methods (Santoso et al., 2022). Occupational Safety and Health (K3) is a way to avoid work accidents that can cause injury to death to workers (Haslindah et al., 2020). The security of a company can be seen with the level of order and maintenance. The various hazards encountered during maintenance come from the process and the equipment used (Hasbi & Koesyanto, 2018). If these indicators can be met, it will automatically create a good working environment for workers. In order to achieve this goal, it is necessary to present a work safety program. A structured program with daily work that can make it difficult to separate from the others. One of the aims of this program is to provide knowledge on occupational accident prevention, first aid, and other guidance regarding work safety. Work safety is creating a comfortable and safe area through the completeness of safety equipment, good lighting, and maintaining good water facilities (Ismi, 2014). Occupational health is a condition that refers to conditions general physical, mental and emotional stability (Aulia & Hermawanto, 2020).

Based on this, it is very important to have regulations that regulate it. As a result, a law was issued that regulates to protect workers and other people in the workplace, namely Law No. 1 of 1970. The safety effort that forms the basis is the attitude of workers towards work safety, which will later be carried out as an implementation of the manufacture and K3 procedures to reduce the dangers that will occur.Work accidents not only have a negative impact on other workers but can affect the company's productivity. Therefore, prevention and K3 culture were created in the work environment (ivanidiyani, 2020).

One of the companies that implement K3 is PT Swadaya Graha which was founded by PT Semen Gresik (Persero), Tbk. There are several reasons and causes of work accidents in the CNC lathe department of PT. SWADAYA GRAHA in 2020-2021. The most frequent cause was found with the number of incidents as many as 10 from the worker's lack of focus and lack of attention to the process of entering the program on the computer. Then the personal protective equipment which was judged to be unusable and the old machine causing 5 accidents at work. Then the workplace that is not cleaned when finished doing work so that it leaves a work mark gives the potential for work accidents and in the range of 2020-2021 there is one work accident caused by that reason. The largest contribution to triggering work accident problems comes from the aspect of human negligence itself (Yolanda Saraswati & Widodo, 2021).

Based on these data, a method is needed that can analyze potential hazards. Therefore, the author has an interest in finding out more about the use of the HIRARC method, especially in the steel fabrication industry at PT. GRAHA INDEPENDENCE.

In addition, it is hoped that this research journal can determine what risks have the potential to arise in cnc lathe work at the fabrication unit of PT. GRAHA INDEPENDENCE. *Hazard Identification Risk Assessment And Risk Control*(HIRARC) is a series of processes that can identify hazards that have the potential to arise in the process of work activities, then assess the risks that can arise from the identified hazards so as to minimize the adverse impacts that may arise (Fauzi et al., 2021).

The purpose of implementing K3 efforts is to anticipate accidents in the work environment. Therefore, the implementation and development of occupational safety and health programs must be based on the risks and hazards that exist in the work environment (Angkasa & Samanhudi, 2021).

2. Literature Review

2.1 Hazard Identification

Hazard identification is the act of determining the potential hazards that arise. From the known hazard characteristics, it can be determined which work safety measures or steps can be taken (Naresti et al., 2022). Hazard identification is one of the first steps aimed at controlling and identifying hazards. After the potential hazards are identified, ways to overcome them can be determined. Hazard identification can be started from the planning stage. The initial concept design can be examined to determine how to control the hazards and risks that may exist in the work area.

Based on the minister of manpower as stated in PERMANAKER No. 05/MEN/1996 states that the process of identifying the source of danger is carried out by considering the conditions of the event that are considered to have the potential to create a hazard and the types of accidents that may occur (Wulandari, 2017).

In identifying hazards, there are several sources of knowledge that can be used as a basis for identifying hazards. Some of them are personal experience, knowing from someone who has experienced dangerous situations that they have studied and adhered to based on work standards.

2.2 Risk Assessment

After identifying the hazard, a risk assessment is carried out. A risk assessment is carried out to evaluate the magnitude of the risk and the potential impact (Armaeni K, 2020). There are 3 methods of risk analysis, namely qualitative, semi-quantitative, and quantitative. Qualitative analysis uses the word form in explaining the magnitude of the potential danger that will occur. In semi-quantitative analysis, the qualitative scale has been known and then given a rating scale. While quantitative analysis uses numerical or numerical values to calculate potential hazards that can arise (Wildan, 2014). Risk is a factor that causes uncertainty about the occurrence of an event that results in losses that will affect the company (Kadir et al., 2020).

In the analysis process there are 2 important components in the risk assessment. The first is the level of likelihood of risk (likelihood). Likelihood is carried out by classifying the probability of occurrence by dividing from the information "almost certain to occur" to "rarely happening". The second is the severity of the risk (consequence). Consequences are carried out by dividing the level of severity of the hazard that occurs starting from the "insignification"

statement, namely no injury and small financial loss, to "catastrophic" i.e. death, poisoning to outside the area, and major financial deterioration.

2.3 Risk control

The function of risk control is to minimize the impact of risks that may occur. Once minimized, it will be easy to determine how to prevent work accidents (Ihsan & Nurcahyo, 2022). A process used to identify and control all possible hazards in the workplace and carry out continuous review continuously to ensure that the work they are safe (Supriyadi et al., 2010). Risk control will focus on the highest accident potential in the hope of minimizing to prevent major negative impacts. Details of risk control can be found through several ways such as interviews or direct observation in the field. From this data, it is processed and the appropriate risk control can be determined.

There are several risk control methods that can be done. The first is elimination, a handling technique by eliminating the source of the hazard. For example, when a damaged road is repaired, a noisy engine is turned off, and oil spills on the floor are cleaned. The second is substitution, a handling technique by replacing tools, materials, materials with safer or less hazardous ones. Third is technical control, by making improvements to the design, equipment, and installation of safety equipment can control the risks of hazards that may occur. Fourth, administrative controls, work shift arrangements, work breaks, and safer work procedures can control hazard risks. Fifth is the use of personal protective equipment (PPE), safety equipment such as goggles, helmets (Sakti, 2019).

2.4 Risk Map

Risk mapping is the result of calculating and analyzing risk levels, parameters of threats, vulnerabilities, and capacities in disaster-prone areas. The risk analysis carried out must be specific to the components that affect it.

The benefit of risk mapping is that areas that have a certain level of potential hazard are mapped. This can then be used as a basis as a tool for designing work accident prevention.

In this study, questionnaires were distributed to 4 respondents, namely to the K3 HSE team there were 3 people and 1 operator in the CNC lathe department. From the respondent's data, they are grouped according to the table below.

Table 1 - Risk Classification

Risk level	Risk value
Extreme	12 - 25
High	7 - 11
Moderate	4 – 6
Low	1 -3

2.5 Hazard Identification Risk Assessment and Risk control(HIRARC)

HIRARC is one of the methods in K3. This method serves as a tool to minimize to prevent work accidents in the work environment (Giananta et al., 2020). The flow of the HIRARC method begins with determining the type of work activity. Once determined, then proceed to identify the potential source of danger so that the risk of danger is found. From these risks, an assessment can be made and ways to control them can be found so that they do not have a hazard impact (Ramadhan, 2017).

In general, the purpose of the HIRARC method is to identify hazard factors, provide a risk assessment, and enable regular planning and monitoring so that risks can be ensured that they can be controlled. Hazard identification carried out through this method must be carried out in its entirety including regular and irregular activities and work carried out by all workers. The identification carried out must also be carried out by workers who already have the capacity and competence to identify existing hazards.

3. Research Methods

This research is a quantitative research where the data used is primary data namely data collected by researchers directly from the first source in the form of results observation, interviews and documentation (Widodo et al., 2022). There are many things regarding occupational safety

and health (K3) that must be understood before making the HIRARC. Terms such as K3, hazard, risk, and OHSAS 18001:2007 will be found in this research. The preparation of HIRARC is divided into stages, namely hazard identification, risk assessment, and risk control (Irawan et al., 2015).

HIRARC is a series of processes to identify hazards that can occur in routine activitiesor non-routine in the company then conduct a risk assessment of the hazard and then make the hazard control program so that the risk level can be minimized to a lower level with the aim of preventing accidents (Nur, 2021).

The hope of this research is to find out the procedures for analyzing the potential hazards that can arise and their control efforts. This study is devoted to analyzing the risks in the CNC lathe department at the steel fabrication unit workshop at PT. SWADAYA GRAHA Gresik.
There are several assumptions in this study. First, workers are considered to have understood all regulations regarding occupational safety and health. Second, workers already understand their respective roles in their work. Third, the K3 system that applies to PT. SWADAYA GRAHA did not change during the research.

The workflow in this research is started with identification through literature and field studies. Then the data is processed through the Hazard Identification Risk Assessment and Risk Control (HIRARC) approach. The data that has been processed is then poured descriptively on the results and discussion. The results and discussion will produce conclusions and suggestions that can be given to the company and to a further researcher.

Using the HIRARC method is believed to be an indicator to increase company productivity because workers have a small potential to experience work accidents. Because this can cause workers to work optimally and can increase company productivity. One company that has implemented and experienced an increase in productivity is PT. Toyota Astra Motor. In the journal that discusses this, it is stated that the HIRARC method uses a simpler form in a shorter time, and can be applied immediately.

4. Results and Discussions

4.1 Hazard identification, risk assessment and hazard control on cnc lathe operator

The process of identification, risk assessment, and hazard control are carried out during the Job Training process at PT. SWADAYA GRAHA on the CNC lathe. The work process flow of the CNC lathe department begins with preparing machines and tools and measuring the dimensions of the workpiece. Next is the installation and flashing of the workpiece on the chuck. The machine can be started and then determine the zero point of the workpiece. Programs that have been created are included. The machine then works according to the program that has been entered.

Based on the workflow on the CNC lathe, several hazards and risks that can occur are found. Among them are sparks and smoke when the machine is working, which can injure your hands, especially if you don't use gloves. The hot material can cause minor burns and scratches to the hands. Materials that can fall on workers when neglecting to place materials. Then the potential for disturbances in the respiratory tract due to a dusty work area.

Table 2 -Work Process, Hazard Identification, and Risk

No	Stages of work	Hazard identification	Risk
1	walking cnc lathe	Grams and sparks, smoke from the turning process	Splashed by gram, injured hands due to neglect to wear gloves.
2	Cleaning materials	hot material	Blisters or minor burns
3	Check material	hot material	Scratched hands
4	Moving materials	Material falling when lifted using a crane, improper placement by workers	Limbs pinched, crushed by falling material
5	Clean the work area	Dusty work area	Respiratory disorders

4.2 Risk Assessment (risk assessment)

Risk assessment is a step to assess by determining the risk that is carried out on all sources that are found to be potential hazards (Fitri Damayanti & Mahbubah, 2021). This process is intended to determine the magnitude of the risk and its level. The assessment is carried out by comparing the likelihood of a risk occurring (likelihood) with the severity of the risk (consequence).

Based on the questionnaire distributed to the respondents, the risk assessment is determined which is shown in table 3.

Table 3 - Risk Assessment

Hazard Identification	Risk level	Risk assessment percentage
Sparks and smoke	Extreme	39%
hot material	Currently	14.6%
Material fall	Tall	21.95%
Dusty work area	Currently	9.8%

From the results of the risk assessment data, it is then continued by continuing by determining the ranking of the hazard sources from the highest (extreme risk) to the lowest (low risk) which will then be used to determine priorities for risk control.

The highest hazard source rating is when the cnc lathe process runs with extreme predicates. Then the material transfer process is highly rated. The rest of the danger sources are of medium rank.

Risk assessment has the aim of finding a value of potential risk ( ) of work accidents. The determination of this risk level is based on the likelihood of the event (likelihood) and the severity that can be caused (severity).

4.3 Risk Control

Risk Control is a stage to carry out risk control (Robby Surya Poernomo & Nyoman Sutapa, 2019), namely Risk control is the next stage to be able to minimize and prevent work. Risk control according to OHSAS 18001 provides risk control guidelines more specific (Rifani et al., 2018). accidents that have the potential to occur in the work environment. Based on the identification and pre-determined hazard rating, it can be determined the hazard control in the running cnc lathe process activity by modifying PPE such as the use of a strap on the glasses that is tied to the neck so as not to fall. Then the work process related to the material can be controlled by using gloves in accordance with the agreed rules. Then always clean the work area and use PPE according to the SOP to avoid the danger of dust on the respiratory tract. Recommendations for control that can be carried out from the selected risk level are misinformation and Procedure is the socialization of JSA, carrying out daily safety briefings, and installing safety signs.

5. Conclusion

The results of the risk assessment in the CNC lathe area of PT. SWADAYA GRAHA shows that in table 3 there is 1 danger of extreme risk category, and 1 danger of high risk, and 3 dangers of medium risk. The majority of potential hazards that arise are due to the lack of PPE and the undisciplined workers and not following work SOPs. So the suggestion is that it is necessary to re-socialize and always remind each other about SOP information through daily safety briefings and safety signs.

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