

ASSESSMENT AND HAZARDS IDENTIFICATION ANALYSIS

RISK CONTROL IN WELDING WORKSHOP

SMK NEGERI 2 PEKANBARU

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ABSTRACT

Hazard identification is a stage that can provide comprehensive and detailed information about the risks found by explaining the consequences of the lightest to the most severe. The purpose of this study was to determine the danger, assessment and control of risk in the Welding Workshop of SMK Negeri 2 Pekanbaru. The type and design used in this study were descriptive qualitative research with an observational approach with 4 informants. The results of the study were 13 cases that had the potential to cause danger with a high risk level of 7 cases with a percentage of 54%, moderate risk level of 2 cases with a percentage of 15%, a low risk level of 4 cases with a percentage of 31%.

Keyword : *Hazard Identification, Risk Assessment and Risk Control*

1.INTRODUCTION

Occupational safety and health are urgently needed in the world of work to create a workplace that is safe, healthy and free from environmental pollution by maintaining and protecting workforce health, security and safety so as to prevent or reduce the occurrence of occupational accidents and diseases, and ultimately increase work efficiency and productivity systems. Work accidents are defined as work-related events that can cause injury or illness (depending on the severity), death events, or events that can cause death (OHSAS 18001: 2007). Based on BPJS Ketenagakerjaan data in Isafety Magazine for the period of December 2018, the number of work accident cases in 2017 experienced a significant increase of 123,000 cases of work accidents with 3000 workers who died, from the data on work accident cases then some were stated, total

disabilities, partial disabilities , have a functional disability and are declared cured after receiving medical treatment.

In 2018, temporary data obtained until the first quarter of 2018 work accidents reported were 5,318 work accidents with 87 workers who died, 52 disabled workers and 1,361 other workers were declared cured after receiving medical treatment. In accordance with the requirements of OHSAS 18001, the organization shall establish procedures regarding hazard identification (hazard identification) risk assessment (risk assessment), and determine the control (risk control) or abbreviated as HIRARC. Hazard identification is carried out with the aim of describing the risk that can be caused by hazardous factors in the work environment, then conducting a risk assessment with probability and severity parameters, then describing how big the impact of the identified hazard potential is with a risk rating to evaluate the magnitude of the risk and scenario of the impact.

Based on the results of the research, conducted by Hazyiyah Ghaisani and Erwin Dyah Nawawinetu in 2014 at PT Cibaliung Sumberdaya Banten regarding Hazard Identification, Risk Assessment and Risk Control in the Blasting Process, it shows that there are 14 identified hazards, the results of the risk assessment are 3 hazards with moderate risk and 11 hazards with low risk. Types of hazard control that have been carried out include technical, administrative and provision of personal protective equipment. Based on the results of the research, which was conducted by Murdiyono in 2016 at the Welding Workshop of SMK Negeri 2 Pengasih regarding Hazard Identification, Assessment and Risk Control, it is known that the research results show that the hazards identified in the welding workshop are 45 hazards, the risk assessment in the welding workshop consists of low risks. a total of 38 hazards and a moderate risk of 7 hazards, the existing risk control in the workshop consists of 26 planned risk control actions and 19 unplanned risk control actions.

Occupational safety and health does not only lead to companies but also in a vocational education institution that requires occupational safety and health in carrying out a practical lesson, in contrast to high schools (SMA) which do not specifically teach students about certain fields. SMK provides teaching that is more applicable and more focused on certain fields and

prepares students to enter certain job fields, such as technology and industry, business and management, tourism, and so on. (Ministry of Education and Culture, 2016). Educational institutions such as Vocational High Schools are a form of formal educational institutions that prioritize the development of knowledge, abilities and preparation of students to enter the workforce and carry out certain types of work. Therefore, the field of expertise in SMK must be adjusted to the areas of expertise needed by the industry, one of the Skills and Competency Study Programs at SMK Negeri 2 Pekanbaru, namely the Mechanical Engineering Skills Study Program with Welding Engineering Expertise Competencies.

Based on observations made by researchers at the SMK Negeri 2 Pekanbaru workshop on Wednesday, January 23, 2019, there were some students who did not pay maximum attention to occupational safety and health aspects such as not wearing complete Personal Protective Equipment (PPE), not complying with Standard Operating Procedures (SOP) for the use of machines and practical tools, besides that there is still a lack of supervision of teachers and technicians when students practice, the school has provided PPE but limited procurement of equipment is not appropriate with the number of students. If this is left unchecked, it can create a potential hazard which in turn can result in a work accident. Considering the above problems, the researcher is interested in carrying out research at the school with the research title Analysis of Hazard Identification, Assessment and Risk Control at Welding Workshop at SMK Negeri 2 Pekanbaru City.

2.MATERIALS AND METHODS

The type and design used in this study is a qualitative descriptive study with an observational approach. This research was conducted at SMK Negeri 2 Pekanbaru, which is located at Jalan Pattimura No.14, Cinta Raja, Sail, Pekanbaru City, Riau. Qualitative research does not use population, the determination of the sample is carried out when the researcher starts to enter the field and during the study (emergent sampling design). In this study, the samples were 4 teachers and instructors. The media used in this study were stationery, laptops, cellphones, and notebooks. Data collection in this study was carried out in natural settings (natural conditions), primary data sources, and data collection techniques more on participant observation, in-depth interviews and documentation. The operational definition in this research is Hazard Identification, Risk

Assessment, and Risk Control at Welding Workshop at SMK Negeri 2 Pekanbaru. Data analysis is performed by reducing data (data reduction), presenting data (display data), interview matrix, conclusion and verification (conclusion drawing and verifying).

3. RESULTS AND DISCUSSION

The results of the research analysis of Hazard Identification, Assessment and Risk Control at Welding Workshop at SMK Negeri 2 Pekanbaru are divided into two, namely the results of observations and the results of interviews. The results of the observation, namely the Welding Workshop Conditions, use an observation sheet which includes 9 indicators to identify the hazards that occur in the workshop, then the results of these observations are assessed using the HIRA (Hazard Identification & Risk Assessment) form.

Table 4.1 Results of the Observation Sheet (Check List)

	Indicator	Number of grains	Answer	
			Yes	No
1.	Material Handling and Storage	12	12	0
2.	Use of Hand Tools	11	11	0
3.	Machine Safety	17	14	3
4.	Workplace/ Workshop Design	26	24	2
5.	Lighting	6	4	2
6.	Working Weather	7	5	2
7.	Noise and Vibration	3	1	2

8.	Worker Facilities	11	10	1
9.	Workshop Organization	8	7	1
Total		101	88	13

From the table above, it is known that the answer "YES" is a statement that does not have the potential to cause harm and the answer "NO" is a statement that has the potential to cause danger. The results of the interview are the results of obtaining information or data regarding research problems that have been compiled according to the interview guidelines and arranged using a triangulation matrix of the results of the interview which includes 9 indicators as follows:

Material Handling and Storage

Based on field research, researchers conducted interviews with informants to obtain more accurate information regarding the handling and storage of materials at the Welding Workshop at SMK Negeri 2 Pekanbaru. Interview with Informant I, who said:

“The Welding Workshop at SMK Negeri 2 Pekanbaru does not have a material storage process due to limited space in the workshop area, so it does not have a special warehouse for storing materials, materials join the practice area, which often results in students stumbling due to work materials. (Source: Interview, 17 June 2019) ”.

From the results of the interview above, it is known that the welding workshop of SMK Negeri 2 Pekanbaru does not have a material storage process, this is not in line with what has been said that material handling activities are very important activities and cannot be separated in activities or production processes. Management the workshop does not or is less aware of the extent and magnitude of the influence of the material storage process which will interfere with practical activities in the welding workshop and will find it difficult to coordinate material handling such as: product design, plant layout, production planning, and packaging.

Hand Tools

Based on field research, researchers interviewed informants to get more accurate information about the use of hand tools at the Welding Workshop at SMK Negeri 2 Pekanbaru. Interview with Informant I, which reads

“The Welding Workshop at SMK Negeri 2 Pekanbaru teaches students how to use hand tools before they go down to do the practice, otherwise how can they do practical activities, of course they have to use how to use tools properly. (Source: Interview, 17 June 2019) ”.

From the results of the interview above, it is known that the welding workshop of SMK Negeri 2 Pekanbaru has tools that are used to assist and facilitate the implementation of practical activities, such as marking, sculpting, scraping and so on. The condition of the welding workshop is in accordance with the hand tool working equipment, which utilizes hand strength or human power without the help of machine power, such as: vise, file, hand chisel, hammer, screwdriver, hand saw, and others.

Machine Guard

Based on field research, researchers conducted interviews with informants to obtain more accurate information about machine safety at the Welding Workshop at SMK Negeri 2 Pekanbaru. Interview with Informant III, who said:

“The Welding Workshop at SMK Negeri 2 Pekanbaru has powerful machines with a large electric current, and rules of use for user safety must be made, such as making access lines to machines, use soup and K3 posters. (Source: Interview, 17 June 2019) ”.

From the results of the interview above, it is known that the welding workshop of SMK Negeri 2 Pekanbaru has a machine that is used to contain various potential hazards that can threaten the safety and health of students during practice. Therefore, the potential hazards that exist in welding workshops must be controlled or eliminated by eliminating or reducing risks by installing guards on machines and protecting students with personal protective equipment (PPE) for certain risks.

Workshop / Workplace Design

Based on field research, researchers conducted interviews with informants to obtain more accurate information about the design of the workshop at the Welding Workshop at SMK Negeri 2 Pekanbaru. Interview with Informant IV, who said:

"The welding workshop of SMK Negeri 2 Pekanbaru is still in the development stage and adjusting to the existing curriculum new and school operational funds because funds are very limited. (Source: Interview, 17 June 2019) ”.

From the results of the interview above, it is known that the welding workshop of SMK Negeri 2 Pekanbaru has been designed and made in such a way as to make it easier for workshop users to practice. The welding workshop has an adequate place for teaching and learning activities, the distance between the class and the workshop is not too close, easy to access, and there is a tool room and a practice room.

Lightin

Based on field research, researchers conducted interviews with informants to obtain more accurate information about the lighting at the Welding Workshop at SMK Negeri 2 Pekanbaru. Interview with Informant III, who said

"The welding workshop of SMK Negeri 2 Pekanbaru only uses sunlight as a source of light to illuminate the workshop area. (Source: Interview, 17 June 2019) ”

From the results of the interview above, it is known that the welding workshop of SMK Negeri 2 Pekanbaru uses natural lighting which is a source of lighting that comes from sunlight, for natural lighting, large windows, glass walls, and a lot of holes are required. Welding workshops rely on outside light because it has the advantage of using sunlight as a light source, which is a reduction in electrical energy. Natural light source sometimes considered less effective than the use of artificial lighting, apart from the light intensity that is not fixed, natural sources generate heat, especially during the day.

Working Weather

Based on field research, researchers conducted interviews with informants to get more accurate information about the working weather at the Welding Workshop at SMK Negeri 2 Pekanbaru. Interview with Informant III, who said:

"The welding workshop of SMK Negeri 2 Pekanbaru has a machine that produces outputs that can impact the health of students, such as welding radiation and welding dust friction. (Source: Interview, 17 June 2019) ”.

From the results of the interview above, it is known that the welding workshop of SMK Negeri 2 Pekanbaru carries out welding process activities when the practices carried out by students in general, which often occur incidents such as radiation, welding rays, dust, welding fumes, electric shocks and fires. The welding workshop has adequate ventilation in the practice space which is used to maintain and create air according to needs and comfort. The human body always produces heat as a result of the process of burning nutrients with oxygen (metabolism). If the process of removing body heat is disturbed, the body temperature will increase. The work environment with the body always exchanges heat, this heat exchange depends on the temperature of the environment (working climate)

Noise and Vibration

Based on field research, researchers conducted interviews with informants to obtain more accurate information about noise and vibration at the Welding Workshop at SMK Negeri 2 Pekanbaru. Interview with Informant I, who said:

"The welding workshop of SMK Negeri 2 Pekanbaru did not escape the noise, especially when using the grinding tool, which resulted in students speaking never being slow. That is a crucial factor .. (Source: Interview, 17 June 2019)".

From the results of the interview above, it is known that the welding workshop of SMK Negeri 2 Pekanbaru is a workshop that does practice with machines that produce high sound and pressure and noise and vibration are familiar occurrences in welding workshop

Work Facilities

Based on field research, researchers conducted interviews with informants to obtain more accurate information about the work facilities at the Welding Workshop at SMK Negeri 2 Pekanbaru. Interview with Informant III, who said:

"The welding workshop of SMK Negeri 2 Pekanbaru is still in the development stage, for example, there is still a lack of supporting facilities to support the effectiveness of student practices, but what the school has been trying to do, especially the workshop, is the location of the bag, the study room in the workshop and, importantly, the place of practice. (Source: Interview, 17 June 2019) ”.

From the results of the interview above, it is known that the welding workshop of SMK Negeri 2 Pekanbaru provides work facilities for students that can be used to facilitate students in carrying out their practice. These facilities include: changing rooms, hand washing rooms, lockers for easy access to first aid kits, health services (UKS), rest rooms and briefing or training rooms. However, the workshop is not equipped with drinking and eating facilities in a hygienic area, for this situation the school provides a canteen to provide a proper place to eat. Work facilities are very important for students, because they can support student performance during practice, such as in completing more productive practical work.

Work Organization

Based on field research, researchers conducted interviews with informants to obtain more accurate information about the work organization at the Welding Workshop at SMK Negeri 2 Pekanbaru. Interview with Informant II, who said:

“The welding workshop of SMK Negeri 2 Pekanbaru is managed by several teaching staff, such as teachers and technicians. (Source: Interview, 17 June 2019) ”.

From the results of the interview above, it is known that the welding workshop of SMK Negeri 2 Pekanbaru has a work organization consisting of teachers and instructors who work together in educating students in welding techniques. The results of work that have been completed by students, are always informed about the results of their work by the teacher concerned, the teachers also maintain communication with students to build two-way communication by coordinating with students about the maintenance and cleaning schedule of the workshop. The assignments given to students always hone students' skills by making various products, such as:

tables, infaq boxes, and so on, this makes assignments more interesting by forming collective and responsible working group

4.CONCLUSION

Based on the research results of the Hazard Identification Analysis, Assessment and Risk Control at Welding Workshop at SMK Negeri 2 Pekanbaru, it can be concluded as follows:

The hazards identified in the Welding Workshop at SMK Negeri 2 Pekanbaru are 13 cases, including: 3 cases of machine safety, 2 cases of workshop / workplace design, 2 cases of lighting, 2 cases of working weather, 2 cases of noise and vibration, work facilities there is 1 case and work organization there is 1 case.

The risk assessment at the Welding Workshop of SMK Negeri 2 Pekanbaru, there were 7 cases with a high risk level, 2 cases with a moderate level and 4 cases with a low risk level.

Risk control at the Welding Workshop of SMK Negeri 2 Pekanbaru consists of 13 actions, including: security, there are 3 actions, 2 cases of workshop / workplace design, 2 actions of lighting, 2 actions of working weather, 2 noise and vibration, work facilities there is 1 action and work organization there is 1 action.

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