

Identification of Occupational Health And Safety Potential Hazards In The Production Process at UD. Evan Nias Regency

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Abstract

Occupational Health and Safety (OHS) is a fundamental aspect in improving employee performance and company productivity. This research aims to identify OHS potential hazards, analyze the implementation of OHS procedures, and evaluate control efforts in minimizing OHS potential hazards at UD. Evan, Nias Regency. The research uses a qualitative approach with descriptive methods where data is obtained through in-depth interviews with informants and supported by direct observation and documentation studies. The research results show that the identified potential hazards include physical hazards (being struck by heavy objects, being hit by machines, slippery floors), chemical hazards from production materials, ergonomic hazards (incorrect body posture, repetitive movements), and work accident risks. Implementation of OHS procedures is carried out through strict OHS policies, provision of complete Personal Protective Equipment (PPE), periodic training, as well as routine supervision and audits. Control efforts include machine and equipment modifications, periodic risk evaluations, strict report follow-up procedures, and effective feedback mechanisms. Although OHS implementation is already quite good, there are still obstacles such as lack of employee awareness, budget limitations, and resistance to changes in work procedures. Stronger commitment from management is required in improving continuous training programs, safety technology investment, and building a mature safety culture so that OHS implementation is optimal and sustainable.

Keywords: Occupational Safety, Occupational Health, Production Process

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INTRODUCTION

The development and construction of various sectors of economic activity are carried out using various levels of technological advancement. With the application of advanced technology in the modernization process, labor as human resources acting as operators will have an increasingly strategic role in the production process of both goods and services. There are various equipment that have potential as sources of

hazard factors. Therefore, companies that employ labor are obliged to ensure the health and safety of workers (Ramli, 2017).

Every business activity has risks of accidents and occupational diseases. Almost no workplace is completely free from sources of hazards. The use of machines, work tools, materials and production processes has become a source of hazards that can cause accidents. Therefore, safety and health aspects have become general demands and needs. According to the International Labour Organization (ILO), 2.78 million workers die every year due to work accidents and occupational diseases. About 2.4 million (86.3%) of these deaths are due to occupational diseases, while more than 380,000 (13.7%) are due to work accidents (International Labour Organization, 2018).

The Social Security Administering Body (BPJS) Employment recorded that there were at least 110,285 cases of work accidents in 2015, 105,182 cases in 2016 and 80,392 cases until August 2017. Meanwhile, in 2018 it increased sharply to 173,105 accident cases with Work Accident Insurance (JKK) claims worth Rp.1.2 Trillion. According to the Director of BPJS Employment Services, every year on average BPJS Employment handles 130 thousand cases of work accidents, from minor cases to cases with fatal impacts.

Occupational health refers to Law No. 1 of 1970 in Tarwaka (2017) which explains that occupational safety is safety related to machines, work tools, materials and processing processes, work foundations and work environment as well as ways of doing work and production processes. With the guarantee of Occupational Health and Safety (OHS), it is hoped that existing potential hazards can be minimized.

The furniture industry has potential hazards in its work processes. UD. Evan is a furniture industry located in Baruzo Village, Sogaeadu District, Nias Regency. In general, the causes of work accidents are due to fatigue factors that cause decreased efficiency, work performance, and reduced physical strength or endurance of the body, as well as lack of Personal Protective Equipment (PPE). One case of work accident at UD. Evan was in 2021 when a work accident occurred involving an internship student who suffered a broken hand. Due to this, it caused losses to UD. Evan, both economically, in terms of time and energy. Therefore, hazard identification is needed to find, recognize, and describe potential hazards contained in each stage of activity or work Anizar (2019).

METHODOLOGY

Research Approach

This research uses a qualitative descriptive research type. The researcher draws conclusions descriptively with an analytical method based on the data and information obtained. According to Moleong (2021), qualitative research is research that intends to understand phenomena about what is experienced by research subjects such as behavior, perception, motivation, action holistically and by means of description in the form of words and language. Qualitative research method is a research method based on philosophy used to examine natural conditions where the researcher acts as an instrument, data collection techniques and analysis that are qualitative emphasize meaning more (Sugiyono, 2020).

Location and Research Schedule

The research was conducted at UD. Evan which is located in Baruzo Village, Sogaeadu District, Nias Regency, North Sumatra Province. This company was established in 2019, is one of the companies providing manufacturing services for cabinets, chairs, tables, beds and various household furniture made from wood.

Data Sources

The types of data needed are primary data and secondary data. Primary data is obtained through observation, in-depth interviews, and documentation of objects observed in the field. Meanwhile, secondary data is obtained through documentation from various sources such as literature, books, and other library materials related to research variables.

Research Informants

This study involved five key informants from operational and production management, who were selected based on their expertise and strategic positions. The list of informants is as follows:

Table 1. Research Informants

No.	Name	Position
1	Septianus Zandroto	Company Director
2	Feriaman Waruwu	Person in Charge
3	Juliman Zandroto	Operational Manager
4	Noverius Zandroto	Operational Manager
5	Yulius Krismanto	Production Supervisor

These informants provided in-depth insights into operational dynamics, production management, and managerial-level challenges, which form the basis of the main analysis in this research.

Data Collection Techniques

Data collection in this research was carried out using several methods including observation, in-depth interviews, and documentation. The data collection instruments used include interview guides containing structured and semi-structured questions, observation sheets to record observations on OHS implementation in the workplace, and documentation devices such as cameras to document physical evidence and field activities (Silaen, 2018).

Data Analysis Techniques

Data analysis was carried out using qualitative descriptive methods following the Miles et al (2014) model which includes data reduction, data presentation, and conclusion drawing/verification. Data reduction was carried out by summarizing, selecting main points, and focusing on important matters. Data presentation was done to present data in an organized and systematic manner, while conclusion drawing was done by identifying patterns, themes, and relationships between variables (Moleong, 2022).

RESULTS AND DISCUSSION

RESULTS

Identification of OHS Potential Hazards at UD. Evan

What are the physical hazards often faced by workers during the production process? (for example, being struck by wood, being hit by machines, etc.)

Based on the interview results with Mr. Septianus Zandroto as Company Director on August 20, 2024, it was stated that workers often face various physical hazards during the production process, such as the risk of being struck by heavy objects such as wood or other materials. In addition, there is a risk of being hit by operating machines which can cause serious injuries. Environmental factors such as slippery floors or improperly installed equipment can also increase the risk of accidents. The interview results with Mr. Feriaman Waruwu as Person in Charge on the same date added that workers can be hit by sharp objects or hit by material pieces when operating heavy tools or cutting machines. The use of inadequate protective equipment can also increase the risk of physical injury.

Based on the interview with Mr. Juliman Zandroto as Operational Manager, other hazards often faced are the risk of burns, especially if working with machines that produce heat or fire. Workers can also be exposed to hazardous chemicals if there are no adequate protection measures.

Are there chemical hazards or hazardous materials used in the production process?

Based on the interview results, in the production process there is the use of certain chemicals that can pose health risks if not handled properly. Materials such as paint, varnish, and glue are used routinely in product finishing. Excessive exposure to these materials can cause respiratory problems, skin irritation, or other long-term health problems. The company has taken steps to provide Personal Protective Equipment (PPE) such as masks and gloves to workers. However, workers' understanding of the chemical nature used and its potential hazards still needs to be improved through more intensive training.

What about ergonomic hazards? Are there risks related to body posture or repetitive movements experienced by workers?

Ergonomic risks arise from incorrect body posture when working and repetitive movements that can cause musculoskeletal injuries. Workers who lift heavy wood or perform the same movements repeatedly are vulnerable to injuries such as back pain, shoulder injuries, or problems with the wrists. Based on observation results, many workers have not applied correct lifting techniques, and most of the work is still done in non-ergonomic positions. The company has provided training on correct lifting techniques and encouraged task rotation to reduce this risk, but implementation in the field is still not optimal.

Has there ever been a work accident at UD. Evan? If yes, can you tell how the accident happened?

Based on the interview results, UD. Evan has experienced several work accidents, although most were minor accidents. The most serious accident occurred in 2021 when an internship student suffered a broken hand due to being hit by a cutting machine. This incident occurred because the student did not comply with machine usage instructions and did not use the PPE that should be used. This incident became a turning point for the company to be more serious in implementing stricter OHS procedures. The company then increased supervision, strengthened training, and ensured that all workers, including intern students, understand and comply with the safety procedures that have been established.

Implementation of OHS Procedures at UD. Evan OHS Policy

Based on the interview results, UD. Evan implements OHS policy quite strictly, ensuring that every employee receives adequate training regarding occupational safety and health. Standard Operating Procedures (SOPs) related to OHS are strictly adhered to, and routine checks on work equipment and work environment are carried out to minimize the risk of work accidents. The company also conducts OHS audits periodically to ensure that the standards that have been set are actually implemented in the field. In addition, the company provides adequate PPE for all employees according to the type of work performed. OHS policy also includes the provision of complete first aid facilities and a trained emergency response team.

Provision of Personal Protective Equipment (PPE)

The company provides various types of PPE needed to protect workers from existing potential hazards, including helmets, gloves, safety shoes, masks, and eye protection. Every worker is required to use PPE that is appropriate to the type of work they do. Based on the interview results, the PPE provided by the company is in good condition and is updated if there is damage or is no longer suitable for use. The company also holds training periodically on the correct use of PPE to ensure that workers understand the importance of PPE in maintaining safety while working. Supervisors ensure that PPE is used correctly and give warnings if there are workers who do not comply with the rules.

OHS Training and Socialization

OHS training is conducted periodically for all employees. This training includes introduction to potential hazards in the workplace, how to use PPE correctly, emergency procedures, and safe work techniques. Training is not only theoretical but also includes simulation of emergency situations such as fire evacuation drills. In addition to formal training, the company also conducts routine socialization through daily briefings and visual reminders in work areas. The company provides information boards and posters throughout the work area containing safety procedures. This functions as a visual reminder for workers so that they are always vigilant and follow applicable safety standards.

The company also has a policy that requires workers to take exams or understanding tests related to occupational safety after each training. This ensures that every worker not only attends but also understands the material presented.

Supervision and Monitoring

Strict supervision is carried out by supervisors in the field to ensure that safety procedures are followed correctly. Supervisors have an important role in ensuring that workers comply with safety procedures at all times. They provide direct supervision and make corrections if there are workers who do not comply with the procedures set. Routine inspections are carried out on work equipment, work environment conditions, and worker compliance with PPE use. Inspection results are documented and followed up if discrepancies are found. The company also uses incident and near-miss reporting systems as early indicators to evaluate compliance with OHS procedures.

Control Efforts to Minimize OHS Potential Hazards

Control Measures

UD. Evan has implemented various control measures to reduce OHS potential hazards in the workplace. This includes routine training for employees about OHS, use of PPE, and routine inspection of work equipment. Risk evaluation is also carried out periodically in each department, and every identified potential hazard is immediately addressed through appropriate mitigation measures. The company has installed various safety signs in work areas and introduced an incident reporting system that makes it easier for employees to report hazards they encounter. The company also conducts emergency situation simulations periodically, such as fire evacuation drills, to ensure that all employees know what to do in an emergency.

Machine and Equipment Modification

The company routinely makes modifications to machines and equipment to improve safety. Every time there is a technology update or new safety standard, the company immediately assesses whether modifications to the machines are necessary and implements them if necessary. This includes installation of machine guards, emergency stop systems, and improvement of ventilation systems. The company conducts risk analysis periodically and adjusts equipment according to the results of the analysis to minimize the potential for work accidents. The company does not only rely on industry standards but also makes additional modifications if it is found that there are potential hazards that can be minimized through changes to equipment.

Follow-up on Reports or Findings

The company has strict procedures in following up on reports or findings related to unsafe working conditions. After a report is received, an investigation is conducted to identify risks and determine corrective actions. Subsequent monitoring is carried out to ensure that unsafe conditions have been corrected and will not happen again. Every reported incident is analyzed to find the root cause and prevent similar incidents in the future. The company also actively involves employees through safety talk programs and briefings before starting work to identify potential hazards directly from employees who are in the field.

Feedback Mechanism

UD. Evan provides various mechanisms for workers to provide feedback or suggestions related to occupational safety, such as suggestion boxes, regular meetings, and periodic surveys. Incident or near-miss reporting programs are also implemented to allow workers to report potential hazards without fear of being sanctioned. The company also uses technology and information systems in OHS monitoring. The use of applications or OHS management systems helps in collecting data and tracking compliance in real-time, making it easier in evaluation and rapid decision-making. This mechanism helps the company identify safety problems before they become serious incidents.

DISCUSSION

Identification of OHS Potential Hazards

From the research results conducted at UD. Evan, it was found that workers are faced with various potential physical, chemical, ergonomic hazards, as well as work accident risks. This finding is in line with the views of Bendavid & Bozec (2020) who discuss the importance of risk management in manufacturing work environments. They emphasize that risks such as being struck by heavy objects and being hit by operating machines are significant physical hazards in production environments. They suggest strengthening the supervision system and implementing technology to monitor machine conditions as mitigation steps.

Physical hazards such as slippery floors and improperly installed equipment are often overlooked by workers, but have great potential to cause accidents. Cooper (2019) emphasizes the need for safety behavior training to prevent accidents caused by environmental factors. The behavior-based safety approach can help change unsafe worker habits into safer work behavior.

The use of chemicals in the production process adds complexity to OHS management. Hussain et al (2019) revealed that understanding the nature of chemicals used in the workplace and their potential hazards is very important to prevent incidents related to chemicals. They emphasize that education and routine training for workers regarding chemical hazards and emergency procedures are crucial in preventing workplace accidents.

Minghetti et al (2020) underline that the proper use of PPE is very important in preventing hazardous exposure. Their research shows that even small exposure to hazardous chemicals can cause long-term health impacts if not handled properly. They also suggest that strict supervision and continuous monitoring of compliance with PPE use in the work environment should be a top priority.

Ergonomic hazards are often overlooked but have long-term impacts on worker health. Swuste et al (2019) emphasize that poor body posture and repetitive movements are the main causes of musculoskeletal disorders in the workplace. They highlight the importance of ergonomic intervention programs that include worker training and adjustment of work environments to reduce this risk. According to them, training on correct body posture and improvement of more ergonomic work facilities are critical steps in injury prevention.

Rempel (2020) in his writing underlines the importance of ergonomics in the workplace to prevent musculoskeletal disorders, including carpal tunnel syndrome and chronic back pain. He suggests that companies should invest in ergonomic work equipment adjustments and provide routine training for employees on correct posture and how to reduce repetitive physical workloads.

Work accidents that have occurred at UD. Evan emphasize the importance of understanding and implementing safety procedures. Vinodkumar & Bhasi (2019) in their research highlight that workers' understanding of safety procedures is very important in preventing workplace accidents. They found that workers who have adequate awareness and knowledge about safety procedures tend to be less involved in work accident incidents. They also emphasize the importance of continuous safety training to improve workers' understanding and reduce negligence.

Gandhi & Deshmukh (2020) emphasize that negligence in using heavy equipment is often the main cause of work accidents in industry. They state that this negligence often occurs due to lack of adequate training and management failure to ensure compliance with operating standards. In addition, they emphasize the importance of strict supervision protocols and routine safety audits to identify and correct potential negligence.

Implementation of OHS Procedures

The implementation of OHS policy at UD. Evan shows management's commitment to worker safety and health. This is in line with the theory put forward by Sullivan & Wright (2019) which states that the integration of OHS into the company's core business processes is key to creating a sustainable safety culture. They emphasize that adequate and routine OHS training, compliance with SOPs, and periodic audits are important elements in ensuring occupational safety and health.

Sullivan & Wright (2019) also suggest that companies should continuously conduct risk assessments and adapt safety procedures based on audit results and incidents that occur. This proactive approach helps companies identify and address potential hazards before they become bigger problems.

Cooper & Philips (2020) discuss the importance of developing a safety culture through a behavioral safety approach, which emphasizes behavioral change and strict supervision. They state that a strong safety culture can be created through a combination of training, active supervision, and positive behavior reinforcement. They also emphasize the importance of visible leadership in demonstrating commitment to safety.

The provision of adequate PPE is a fundamental step in worker protection. Dawson & Brooks (2020) emphasize the importance of PPE in work environments and a systematic approach to its use. They suggest that the provision of PPE should be accompanied by proper education on how to use it, PPE maintenance, and understanding of when PPE should be replaced. Without adequate education, available PPE may not be used properly or even ignored by workers.

The training program implemented at UD. Evan reflects a comprehensive approach to developing worker safety competence. Blume et al (2019) in their research on competency-based training emphasize that effective training not only teaches technical knowledge, but also develops practical skills and changes workers' attitudes toward safety. They suggest that training should include hands-on components and real situation simulations to ensure effective knowledge transfer.

Strict supervision is an important element in ensuring compliance with OHS procedures. Effective supervision is not only reactive but also proactive in identifying potential hazards before they become problems. Well-trained supervisors can provide direct feedback to workers and help them understand the importance of safety procedures.

Control Efforts for Potential Hazards

The control measures implemented by UD. Evan reflect a proactive approach to risk management. Hollnagel (2019) in the theory of Resilience Engineering emphasizes the importance of the organization's ability to adapt and continue to operate safely despite disruptions or unexpected changes. Focus on strengthening

system resilience, including employee training and periodic risk assessment, is very important to minimize OHS hazards.

According to Hollnagel, resilient organizations do not only focus on failure prevention, but also on the ability to learn from experience and adapt to changing conditions. This means that OHS systems must be flexible and able to adjust to emerging new challenges. Continuous modification of machines and equipment shows the company's commitment to improving safety standards. Dekker (2020) develops the concept that occupational safety systems must be adaptive, meaning they must continue to adapt to technological changes, work environments, and operational procedures. Equipment and machine modification is an integral part of adaptive safety systems, where organizations proactively assess and adjust their work tools as technology develops or safety standards change.

This adaptive approach helps in reducing accident risks and maintaining worker safety in the long term. Companies that continue to innovate in terms of safety tend to have lower accident rates and safer work environments.

Strict follow-up procedures for reports or findings reflect the company's seriousness in handling safety issues. Hollnagel (2019) in the Safety-II theory emphasizes the importance of not only focusing on failure prevention, but also on how systems successfully operate in complex and varied conditions. In this context, when the company receives reports about unsafe working conditions, investigation should not only focus on errors or failures, but also on understanding what usually goes well and how to ensure the system continues to function within safety boundaries.

Effective feedback mechanisms are an important element in a mature safety culture. Guldenmund (2020) in the Safety Culture Maturity Model states that organizations that are more mature in terms of safety have clear and effective mechanisms to involve workers in discussions about safety. Implementation of incident or near-miss reporting programs shows the company's commitment to achieving a higher level of maturity in safety culture.

By providing various mechanisms for feedback such as suggestion boxes and periodic surveys, UD. Evan shows efforts to increase safety culture maturity. The safety culture maturity model identifies various levels of development, from reactive organizations to proactive and generative organizations in their safety approaches.

The use of technology in OHS monitoring shows a modern approach to safety management. Technology-based OHS management systems can help in collecting data in real-time, analyzing safety trends, and providing early warnings about potential hazards. This enables management to make faster and data-based decisions in handling safety issues.

CONCLUSION

Based on the research results at UD. Evan, Nias Regency, it can be concluded that workers are faced with various potential hazards including physical hazards (being struck by heavy objects, being hit by operating machines, slippery floors), chemical hazards (exposure to paint, varnish, and glue), and ergonomic hazards (incorrect body posture and repetitive movements) that can cause serious injuries to chronic health disorders, as confirmed by the 2021 work accident incident. Implementation of OHS procedures is carried out quite comprehensively through

strict policies that include provision of complete PPE, periodic training on hazard recognition and emergency procedures, strict supervision and monitoring by field supervisors, and periodic OHS audits to ensure compliance with safety standards. Risk control efforts are carried out proactively through machine and equipment modifications, periodic risk evaluations, procedures for following up on findings of unsafe conditions, and provision of effective feedback mechanisms through suggestion boxes, regular meetings, and incident reporting programs. Nevertheless, there are still challenges that need to be addressed including employee awareness that needs to be improved, budget limitations for safety investment, and resistance to changes in work procedures from some employees. To achieve optimal and sustainable OHS implementation, stronger management commitment is required in improving continuous training programs, modern safety technology investment such as real-time monitoring systems, and building a mature safety culture through active involvement of all employees, visible leadership, and strengthening fair reward and punishment systems to create a safer and healthier work environment in the long term.

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