



Analysis of Near Miss Hazards on Aircraft Lift Transport Riau Toll Road Construction Project

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ABSTRACT

Each year, non-fatal work accidents occur nearly 1,000 times more than fatal accidents. An estimated 374 million workers experience non-fatal accidents each year. 2.4 million (86.3%) deaths are caused by occupational diseases, and more than 380,000 (13.7%) are caused by industrial accidents. PT Petronesia Benimel utilizes lift-transport aircraft in carrying out activities. From the use of this tool, potential hazards arise that can threaten the safety of workers. This study aims to determine the potential near miss hazards that can occur in the process of operating the lift-transport aircraft. This type of research is qualitative through secondary data and observation. The research informants consist of 4 main informants, namely the executor (foreman), operator, HSE supervisor, technician, helper (dumpman). Supporting informants are field managers. The research was conducted in the construction project area of the Riau toll road construction which is a project of PT Petronesia Benimel on November 27-December 14, 2023. The results of this study are the causal factors of the near miss incident on the lift-transport aircraft, namely from the material factor that pays attention to the load of heavy equipment which aims to make workers careful, the method factor that pays attention to the position of the blind spot to make it easier for the helper (dumpman) to assist the operator in backing up heavy equipment, the human factor ensures that the operator has an SIO (Operator's License), remembers the warnings given by the company and conducts health tests for workers, and environmental factors by paying attention to the safety sign layout and the correct use of PPE.

Keywords : aircraft lift-transport, near miss, toll construction project

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INTRODUCTION

Occupational Safety and Health (OSH) is an absolute thing that cannot be separated from the work system, and of course is directly related to human resources (1). OHS is important from the point of view of social security and social welfare of workers, and can have a positive impact on the success or failure of a company's productivity (2). According to the Decree of the Minister of Manpower of the Republic of Indonesia K3 No. Kep. 463 / MEN / 1993 is a protective measure that aims to ensure that workers and other people in the workplace / company are always safe and healthy and all production sources can be used safely and efficiently (3). According to the Industrial Safety Act No. 1 of 1970, the purpose of occupational safety and health (K3) which is directly related to machinery, equipment, workplace foundations, and the work environment is to prevent occupational accidents and diseases and provide protection to workers (4). Production sources that can increase efficiency and productivity. With the presence of OHS, companies can prevent accidents so as to prevent casualties and property damage (5). Many factors can cause workplace accidents, including lack of worker knowledge, lack of worker skills, use of technology and tools (6).

Work accidents will cause various kinds of losses, namely to the company and losses to workers (7). in the company, namely paying compensation to workers as a result of accidents, while losses to workers can occur injuries, disabilities, and even death (8). There is always a risk of work accidents when doing work. One of them is the potential danger of lifting equipment commonly found in warehouse areas or commonly referred to as logistics (9). The storage area itself can pose a high enough hazard when carrying out work activities, resulting in the risk of near misses and industrial accidents that result in the loss of property, materials, and human lives (10). The obstacle of construction OHS management in the implementation of OHS is the support of top management, this is because construction projects require a lot of labor, the minimum possible work time limit, with little cost but as much profit as possible (11). Therefore, construction projects with top management that do not support the implementation of OHS will result in a lack of efforts to prevent and control workplace accidents such as lack of availability of PPE, lack of medical facilities, weak monitoring and evaluation related to OHS, and lack of implementation of OHS commitments in accordance with policies as a fulfillment of laws and regulations (12).

The use of technology or assistive devices will greatly facilitate the work process, one of which is in terms of moving goods by lifting and carrying (13). If the load being transported is quite heavy and only relies on human labor alone, it will feel very heavy (14). Therefore, a tool is needed that can help workers to lift and move various kinds of cargo from one place to another easily and quickly in locations or areas, departments, construction, construction sites, storage areas, unloading cargo and so on (15). According to OHSAS

18001:2007 (Occupational Health and Safety Assessment Series) a near miss is an accident that does not result in injury, illness or death. If a near miss occurs, there is generally a risk of accident. This was first proposed by Heinrich, who conducted statistical research on accidents and created an accident pyramid, which is now better known as the accident rate (16). One of the companies that apply lift-transport equipment is PT Petronesia Benimel, which is a construction company that runs a business in the field of engineering, procurement, construction that provides construction services. In the area of PT Petronesia Benimel, there has been a near miss incident in the position of helper (dumppman). Based on the above background, research can be conducted on the analysis of near miss hazards in the application of OHS related to the use of lifting and carrying aircraft on the Bangkinang-Pangkalan toll road project at PT Petronas Benimel.

METHODS

This research uses qualitative research. Qualitative research is research conducted to study research objects in depth in natural conditions whose research data is in the form of interviews and company secondary data. The research was conducted at PT Petronesia Benimel, this research was conducted for 17 days, starting from November 27 to December 14, 2023. The informants in this study consisted of 4 main informants. The main informants are those who are directly involved, namely the implementer (foreman), operator, HSE supervisor, technician, helper (dumppman). Supporting informants are field managers on the Riau toll road construction project. Data collection techniques with in-depth interviews and questions to be asked to several informants. Make observations and record the results to be analyzed with other data so as to get conclusions as a basis for making this residency report.

RESULT

PT Petronesia Benimel is a subsidiary of PT Hutama Karya Infrastruktur (HKI) engaged in construction, especially construction, electricity, instrumentation and heavy equipment rental. PT Petronesia Benimel has completed the construction of the 24.7 km Bankinang-Pangkalan Phase 1 (Tanjung Alai) toll road. The progress rate is 88.58%, scheduled for completion in December 2023.



Picture 1. Lifting and Transporting Aircraft in the Riau Toll Road Construction Project

Near miss incident

A near miss/ near accident/ incident is an event that is undesirable, but does not result in loss. Based on the location or area of the near miss event, for near miss data related to the use of transport aircraft, there was 1 near miss or near miss event recorded due to operations in the toll following is a chronology report of near miss events at PT Petronesia Benimel related to the use of lift aircraft:

Table 1. Near Miss Data

No	Time		Position	Name	Age	Location	Chronology
	Date	Clock					
1	June, 25th 2022	04 PM	Helper (Dumpman)	M.F	32	Riau highway construction project	The helper (dumpman) is behind the heavy equipment which should be positioned on the right or left, to guide the backing but sometimes is not clearly visible to the operator and is almost hit by the heavy equipment when backing.

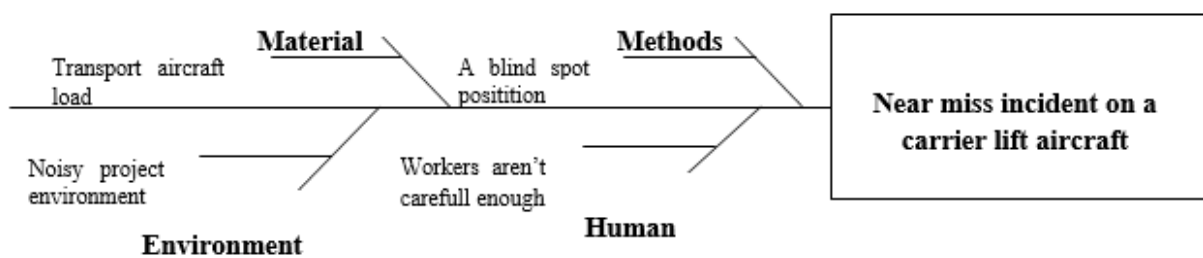
From the near miss incident that has occurred in the report, there is negligence from the operator in doing his job that causes a near miss situation. In this case there is an error during the operation carried out by the operator, namely the operator will reverse the tool but sometimes cannot see the helper (dumpman) who is behind the tool, which should be on the left or right side of the tool because the back of the tool has a blind spot position. Near miss or near miss events do not cause human losses, but the existence of near miss can be an early indication of the onset of a work accident or accident. For this reason, it is necessary to take appropriate countermeasures to prevent the incident from recurring and prevent accidents from occurring.



Picture 2. Conducting Interviews with Operators and Helpers (Dumpman)

Cause Analysis of Near Miss Events

Analysis of the causes of near miss events using fishbone diagrams. The preparation of a fishbone diagram is carried out to identify the factors that cause near miss events in the lifting and transport equipment in the Bangkinang-Pangkalan toll road project area of PT Petronesia Benimel. By identifying the factors that cause work accidents, it will be easy to find solutions or ways to prevent them. The following is an explanation of the factors that cause near miss events from each category on the fishbone diagram, which includes: **Methods:** There is a blind spot position that results in the operator not being able to see clearly when backing up the machine, resulting in a near miss. **Human:** Workers are less careful; workers often do their work carelessly, such as doing work unfocused, even though they are used to doing the work, but there are times when they work carelessly even though it is an obligation when doing work. **Material:** The load on the lift-transport aircraft or heavy equipment carried by the operator such as excavators, bulldozers, forklifts, gondolas, electric hoist cranes and chain blocks. **Environment:** Noisy environment; engine noise from road construction equipment is quite loud, the amount of heavy equipment and truck activity in the area is quite noisy.



Picture 3. Fishbone Diagram of Near Miss

DISCUSSION

Based on the causal factors that have been identified from the fishbone diagram analysis, preventive efforts that can be implemented in the Riau toll road construction project as a step to overcome the occurrence of near miss situations to work accidents, namely the method factor by strengthening KY (Kiken Yochi). KY is a routine and mandatory thing to be done by companies to workers before doing work. The purpose of KY is to predict all risks that may occur during work, prevent accidents, and reduce accidents to zero, pay attention to blind spot positions that make operators unable to see clearly when backing up heavy equipment so that the helper (dumpman) can take the left or right side when helping the operator back up heavy equipment. Human

factors by ensuring that operators must have an SIO (Operator's License). Because with SIO, a company will be able to assess whether the person or operator is indeed worthy of working in the company or not, a warning in the form of a Soccer Card. Soccer cards are used by companies as a warning sign to workers who make mistakes. Soccer cards are divided into 3 colors that are adjusted to the level of mistakes made, such as yellow (small), red (medium), black (high), and worker health tests before starting work. The purpose of occupational health checks is to ensure that workers are in the best state of health and fitness to work, and to ensure the safety and health of workers and other employees. Material factors by paying attention to the load of transporting heavy equipment and turning on the siren/alarm when it will be operated. When operating the siren/alarm must be sounded, this is so that all workers know that the operation is taking place and if there are workers who will cross the area, they can be careful and look at the surrounding conditions. Environmental factors and personal protective equipment (PPE) are used to maintain worker safety. Examples of potential hazards in the workplace include noisy environments, heavy falling objects, injuries from production machinery, and chemical exposure, which can be prevented through the use of personal protective equipment. For example, wearing masks, protective helmets, vests, safety shoes, gloves, foot gloves, gloves on the arms, safety glasses, earplugs, and others, as well as paying attention to the placement of safety signs or work safety signs (K3). Safety signs play an important role in minimizing risks and hazards and preventing occupational accidents and occupational diseases in the workplace. Safety signs are visual communication media in the form of pictograms/symbols and text that help convey hazard information and OHS messages to workers, contractors, and guests in the company environment.

CONCLUSIONS

Based on data owned by the company in the period of 2022 there was 1 near miss incident in the use of heavy equipment in the Bangkinang-Pangkalan toll road project area caused by human factors. Based on the analysis through the fishbone diagram, there is a human causal factor caused by workers who are less careful in doing work such as doing work unfocused. Preventive efforts from the presence of human factors are by ensuring operators are required to have SIO (Operator License), warnings in the form of Soccer Cards, and health tests for workers before starting work.

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