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An Experimental Site Study on the Actual Implementation of Occupational Safety and Health (OSH) In Manufacturing Process at PT. Asahi (Rubber) Indonesia

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A R T I C L E I N F O

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A B S T R A C T

Particularly in developing countries, the trend of demand and usage for this heavy transport machine increases time to time. More for Indonesia, geographic dispersion across islands further complicates distribution and inventory management. As self-suspicious and concern on lack of safety such as in this company, the research study will observe directly to site on low manpower safety awareness and this local manufacturer's low safety concern as the first and second hypothesis to be evaluated. By facts found, it may be caused by several overlooked - forgotten thoughts safety issues identified in this observational research study that actually need to be addressed to fulfil the lack of safety culture. Recruiting HSE person developing safety rules on the production process and monitoring the daily implementation among the operators become the first movement for solution of safety issues while trying to have better manpower's education level.

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INTRODUCTION

Demand for heavy equipment directly depends on economic growth in the country. A rise in investment in the construction industry as a proxy for infrastructure growth, mining, agriculture, forestry, and other industries will create demand for heavy equipment. As business opportunities for heavy equipment in Indonesia are estimated on an upward trend among Association of Southeast Asian Nations (ASEAN) countries, then heavy equipment manufacturers plan to expand their markets (Simatupang Togar M, Ramaswami Sridharan, 2016, Acritical analysis of supply chain issues in construction heavy equipment).

Regarding to keeping the equipment in good condition to support on development such as infrastructure growth, mining, agriculture, and construction sectors then some options can be the ways. The ways can be on the initial – investment cost to buy selective equipment or to have well management on operation in term of efficient operation, on considering life time of equipment instead of keeping the equipment getting deep maintenance at the frequent repressive maintenance, or by rental scheme of necessary equipment or combination of those options (Sugiyono, L. A., & Syairudin, B. 2021. Economic Analysis of Heavy Equipment Supply for Fulfilling Raw Materials).

Strategic Management Theory states that in order to achieve competitive advantage, companies must be able to identify and utilize Critical Success Factors (CSFs) that are relevant to their industry. In the context of the heavy equipment business, CSFs include factors such as new technology adoption, cost management, and operational optimization. Then technological innovation and resource management should be necessary to considered on (Febrianto Anggie, 2024, Critical Success Factors - CSF Business Heavy Equipment in Indonesia).

The absence of essential spare parts in inventory causes a heavy mobile equipment to become inactive and unable to complete its rounds. Therefore, it causes many situations such as revenue loss, serious costs, customer dissatisfaction, and loss of prestige or vice versa if keeping unnecessary spare parts in inventory as having too many or too few spare parts is not efficient (Ifraz Metin, 2025, A Systematic Literature Review on Spare Parts Classification, Inventory, and Warehouse Management). In term of making sure the availability of essential parts, inventory management becomes important to be considered on as well (Immadisetty Amarnath, 2025, Real-Time Inventory Management). More than that, considering on supply chain management including on applying inventory technology is essential in order to maintain the supply side of raw material including spare parts (Wahyudi Sofian, 2023, Evaluation of Supply Chain Management in Heavy Equipment Industry).

Of all the above consideration, then local manufacturer becomes important to be exist. And, PT. Asahi Indonesia or rather as PT. Asahi Rubber Indonesia is one of the local manufacturers as downline company of Asahi Rubber Inc which is headquartered in Japan and has expanded into countries in Asia and the Americas. In Indonesia, PT Asahi Indonesia is located in the Jababeka Industrial Park, Cikarang area whose business activities are also manufacturing parts of heavy mobile equipment specializing in the manufacturing of rubber

components or rubber-to-metal assemblies. A room of production is seen as below:



Figure 1. A Room of Production

While kinds of product being produced in this manufacturer is as seen below:



Figure 2. Kinds of Products

Regarding the safety issue, safety culture is something that needs attention as it can have a positive impact on the company. An effective safety culture can help a company to maintain its reputation so that it brings some benefits. good the safety procedures and regulations in an organization are considered to be influenced by the existing culture of the organization. Safety culture is often cited as an important concept in understanding the state of safety in organizations. Safety culture can be seen as one component of organizational culture, which refers to individual, job, and organizational characteristics that affect employee health and safety. The purpose of a positive safety culture is to create an atmosphere in which employees are aware of the risks they face in the workplace and are constantly aware of them (Restuputri Dian Palupi et al, 2021, Relationship Between Safety Culture and The Safety Climate, Safety Behaviour and Safety Management).

Research has shown that industries with mature safety culture tend to have fewer incidents and better operational resilience. Although various high-risk industries such as oil and gas, aviation, and construction have used safety culture maturity models to assess and enhance safety culture, there is a lack of such practical and systematic safety application in Indonesia (Astuti Putu Nadi et al. 2025, Assessing Safety Culture Maturity in Indonesia's Petrochemical Producer)

The focus of this observational research study at PT. Asahi Rubber Indonesia is on about the safety implementation related to these activities:

1. Painting process.
2. Drying process by utilizing Oven.
3. Quality Control QC activities.

The painting process is carried out using a sprayer in the painting booth such as seen on the drawing below:



Figure 3. Painting Booth is on Progress

For drying process is done in a drying booth as seen on the drawing below:



Figure 4 Drying Booth on Progress



Figure 5. Electrical Panel

Other activity becomes the focus as well is a quality control activities as drawing below:



Figure 4. Quality Control - QC

IMPLEMENTATION AND METHODS

Based on personal suspicions on lack of safe working practices, particularly in factories such as on this factory as the sample case located in Cikarang industrial area, researcher try to have some observation the hypothesis mentioned above by visiting directly to the site, refer and reviewed them to some related literature references. This research observation will be reviewed and analyzed more by explanatory-qualitative methods by gathering facts at site and identifying possible causality (cause-and-effect) relationships in order to have an explanation on the hypothesis regarding to the real process activities found at site.

RESULTS AND DISCUSSION

Painting Process

Regarding to painting process that is carried out using a sprayer in the painting booth such as seen on the drawing table 1 seen that:

Table 1. Manufacturing Process

NO	MANUFACTURING PROCESS
	PAINTING
1	Operator & Object are in same room
2	Along the process, door of painting booth is open position
3	Room is completed by intake & exhaust fan coonected to air duct
4	By using a sprayer, the operator is painting the part suspended on a hanger
5	Instead of using special clothing and musk as the instruction, the operator is only using general medical mask seen on figure 3.b

It means that:



Figure 7. K3 (HSE) Guideline

As the person and the part are in the same painting booth or same room and to paint the object is by utilizing a sprayer then there is a risk of paint splattering onto your face of the operator and this condition will be not good for the skin around face which means it is less safe for the operator. Other unsafety issue is about the duration of painting process since along the process, when the operator is using a mask without any respirator as seen on figure 3.b that means the respiration of the operator might be limited as still on manually process with no standard duration. Furthermore, it could be potentially impact on low painting quality as limited operator's sight as using glasses and limited light.



Figure 8. Real Painting

Worse and critical condition is as seen on figure 8 that on fact found the operator is not using special safety clothing with special mask as shown on figure 3.b as standard safety mask along the painting process. The operator is just using a kind of medical clothing mask only. Of course, this is an unsafety activity. More than that as seen on the process, it is also potentially have a negative impact on a waste of paint as not so easy for the sprayer focus on just directly to the part.

Drying Process

As drying process is done in a chamber-drying booth as seen on the Table 2

Table 2. Manufacturing Drying Process

NO	MANUFACTURING PROCESS
	DRYING
1	Wall of Drying booth is inserted by heater in the middle although no sign/warning saying heater stuck on outside of the wall (sign saying "Heater" on the Figure is written by researcher just for reporting)
2	Room is completed by intake fan connected to air duct
3	The object being dried are suspended on a hanger in the centre of the chamber-drying booth
4	During the drying process, whilst the heaters are switched on, air is drawn in through the intake air
5	Once the drying process is completed then heaters are switched off and air is expelled through the outlet
6	Around-near the chamber-drying booth utilized high electrical energy looks no fire extinguisher

By a certain hight-electrical energy utilized for the heater installed inside the wall of the chamber booth while the part is suspended in the centre of the chamber, the heater with not just heating the part but also heating the air around the object as well that this might potentially have a negative impact on waste of electrical energy. As in the middle of wall is inserted by heater as seen on the figure 4, then it is not safety along the drying process for persons near the chamber booth as there is a chance that someone might accidentally touch the hot outer side of the wall. Furthermore, as the drying process the part is in center of the chamber-drying booth in that such volume of room or the part is not placed in a box and get the heat then quantity of the part might be necessary to be considered on in term of effectiveness. More, as high-electrical energy have being utilized, then the risk of safety is also higher such as on cables, MCBs, switches, etc and or there is suitable-good sign on word “heater” and/or place the chamber-drying booth in certain safety position in the production room with better safety installation.

Furthermore, potentially as unsafety issue is about the electrical panel of chamber-drying booth seen on figure 5, those are:

1. No meter device embedded on especially volt-meter and amper-meter
2. The place of the panel with high electrical energy inside is located around the space of operators
3. Although high electrical use, but no sign or safety code stuck on panel saying high voltage. etc.
4. Around-near the chamber-drying booth utilized high electrical energy looks no fire extinguisher

Overall, PT. ASAHI (Rubber) Indonesia is recommended to be evaluated to get better layout, production process and inserted recommended safety rules especially for the operation of high electrical energy equipment as refer to reference (Guan Wang Ru, 2024, Predicting Imminent Electrical Safety Incidents).

Quality Control - QC

After the objects passed and going through the manufacturing, painting and drying process then the parts will get QC as activities seen on the figure 6. Looks that the methodology of the QC activities seen more as general visual inspection with no specifical focus of evaluation to the objects. Looks at the activities of QC process done not in a kind of proper desk with a certain standard height in term of having better ergonomical working position. It means that it's not safety to the operator's back condition in term of ergonomical working position to the body of operators regardless the productivity can be achieved.

Of all the result of observation in this research study, safety awareness and even be the habits while company-concern on safety will increase the manufacturing production as having positive attitude, no safety accidents and no disturbance (Fauzi Nadzirah Mohd, et al, 2022, The Effectiveness of Safety Practices on Safety Behavior among Employee).

In this site observation research, all the unsafety activities look allowed and can take place there as working company culture. The study about ways of safety site implementation like in this manufacturing company also has been observed and showed the result a positive correlation between safety climate, job satisfaction, motivation safety against employee safety behavior of manufacturing companies in Indonesia (Indi Djastuti, et al, 2019, Safety Behavior of Manufacturing Companies in Indonesia). More than that, not just operator's education, but it looks there is an interdependence between work motivation and job satisfaction and how operators perform their work (Sudarman E. Pulungan, e al, 2026, Pengaruh Motivasi Kerja terhadap Kinerja Karyawan dengan Kepuasan Kerja).

However, while expecting the awareness, starting by recruiting HSE person to develop safety rules and monitoring the daily implementation on production process can be the first movement for solution of safety issues while running the daily production process. More than that let the manpower have better education level to get easier and faster safety improvement. Safety rules will include rewards such as an additional incentive and punishment as well.

CONCLUSIONS AND RECOMMENDATIONS

Found the fact at site of PT. ASAHI (Rubber) Indonesia to relate and response the hypothesis:

1. It looks there is no consideration on safety rules as a priority as no certain safety standard
2. It seems highly likely that safety awareness is not in the heart of operators and even they have never been any safety training
3. In term of manufacturing company as strengthen the local production in Indonesia such as PT. ASAHI (Rubber) Indonesia looks necessary to develop awareness and high concern on safety things to be as a high consideration at any single activities even be a working culture and overcome the lack of safety issues as seen and occurred and trying to be as similar to global company standard.
4. It looks external party is necessary to be utilized or to be considered on to develop self-awareness, training and regular monitoring the safety issues to reduce the lack of safety accidents.

5. As the first movement for solution of safety issues, get suitable HSE person to develop safety rules and monitoring the daily implementation among the operators on doing the production while letting the manpower have better education level for easier-faster safety improvement.
6. Safety rules mentioned above need to be included rewards such as an additional incentive and punishment as well.

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