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Maintenance Management Damage Prevention on the Twin Shaft Concrete Mixer at PT. X

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A B S T R A C T

PT. Waskita Beton Precast, Tbk is a company that manufactures precast and ready mix concrete with the largest production currently. Producing various high quality concrete with international standards, such as spun pile, full slab, box girder and others. Problems in maintaining production facilities must be considered to maintain quality and increase productivity. When the machine and its components experience damage, the production process can be hampered or even stopped. The purpose of this researchhow is the maintenance management carried out by the companyIn industrial companies, one of the maintenance that must be paid attention to is the maintenance of the machines they own. There are several types of maintenance systems that can be implemented, including: after-breakdown maintenance systems, routine maintenance systems, re-maintenance systems and productive maintenance systems. However, there are times when a component/machine should be replaced based on operating hours in accordance with the manufacturer's instructions to avoid greater losses.

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INTRODUCTION

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Technological developments in the world are very rapid, companies currently required to carry out good productivity in order to produce good finished products without any defects in the products produced. The maintenance management process is needed to measure how well a machine is reliable in carrying out its productivity. This is done so that the company does not experience problems during production that cause the process to stop(Nasution et al., 2021).

In achieving goals and objectives effectively and efficiently, thinking and studies are developed to find better ways. The aim is to produce optimal output, so that it can achieve targets precisely in time, quantity, quality, at an efficient cost by utilizing production factors. This is where good management is needed(Melladya et al., 2014).

Care Management of course costs money. According to Walley (1987), these costs include the value of maintenance stored and used, direct labor costs, all types of indirect labor, and work that is subcontracted. Therefore, a good arrangement is needed so that the implementation of Maintenance Management activities is expected to help maximize the difference between variable costs incurred by the factory and sales results obtained from selling products so that profits can still be obtained. This is the main function of maintenance management(Iswanto, 2008).

Identification of Problems

Based on the background above, the main problems taken by the author are as follows:

1. How is Maintenance Management carried out by the company?
2. In what parts of the Maintenance Management that has been implemented does it need to be improved?Figure 1. Conceptual Framework (**images must be in good quality**)

LITERATURE REVIEW

Maintenance management is an approach used to manage and maintain physical assets or equipment in optimal operational condition. This involves planning, implementing, monitoring, and improving all activities related to

maintaining equipment or infrastructure so that it continues to function as intended.

The description of care management covers several aspects, including:

1. Maintenance Planning: This includes determining the maintenance schedule, type of maintenance required, and allocation of resources such as labor, spare parts, and time required.
2. Monitoring and Inspection: Maintenance management involves regularly monitoring the condition of equipment or assets to detect problems or signs of wear that may require further repair or maintenance.
3. Routine Repair and Maintenance: This includes repair actions necessary to keep equipment in good operational condition. Routine maintenance, such as lubrication or cleaning, is also part of this process.
4. Spare Parts Management: Maintenance management also includes managing the inventory of spare parts required for equipment. This includes procurement, storage and efficient use of spare parts.
5. Performance Optimization: The primary goal of maintenance management is to ensure assets or equipment operate at optimal performance levels. This may include efforts to increase efficiency, reduce production downtime, or extend equipment life.
6. Cost Management: Apart from ensuring optimal performance, maintenance management also focuses on controlling costs. This includes managing the maintenance budget efficiently and finding ways to optimize spending. Maintenance management is critical in a variety of industries, including manufacturing, transportation, healthcare, and many others, because well-functioning equipment is a valuable asset that can support smooth and productive business operations.

METHODOLOGY

Research objects according to Iwan Satibi (2011),In general, a research object is a tool for identifying and mapping a research environment which is the aim of the research to obtain a broad general picture consisting of the nature of the environment, structure, history and function of everything in the research environment.Data collection techniques used include: a. Observation

Nasution, in Sugiyono (2012) stated that observation is the basis of all science. Scientists can only work based on data, namely facts about the real world obtained through observation.

b. Interview

An interview or interview is a form of verbal communication, a kind of conversation aimed at obtaining information (Nasution, 2012). Interviews are a powerful tool for revealing the realities of life, what people think or feel about various aspects of life.

The stages of this research consist of:Preliminary study by reading several previous journals and several supporting books.The following is a research flow diagram.

Data processing aims to resolve and discuss the problem being analyzed. Maintenance management steps carried out in data processing.

Data collection was obtained through company data and direct observation regarding maintenance management at PT. Waskita Beton Precast, Tbk Plant Bojonegara. Using the Failure Mode and Effects Analysis method to find out to what extent corporate governance in carrying out maintenance management has been implemented.

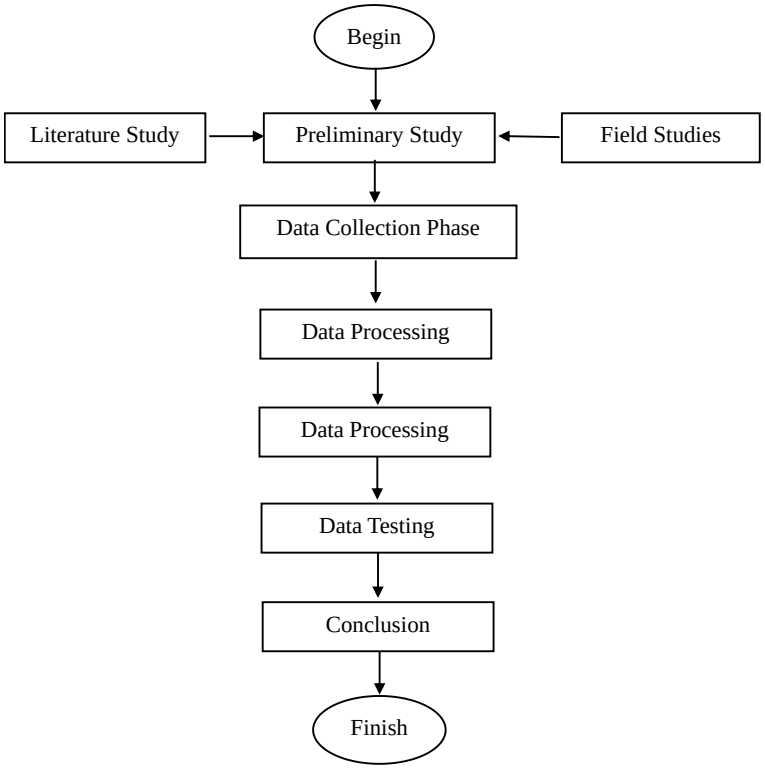

Figure 1. Flow diagram

DISCUSSION

After getting the data that the company manages in its maintenance, the following is the maintenance management carried out by the company at the facility.

The following table shows the governance carried out by the company in maintenance management at one of the facilities in the company, namely the Batching Plant, based on the component units in each part.

Table 1. Facility Maintenance

No.	Name
1.	*Aggregate Feeding System*
2.	*Vibrating Screen*
3.	*Conveyors*
4.	*Water Tanks*
5.	*Pug Mill Mixing*
6.	*Control Cabin Unit*
7.	*Cement Silos*
8.	*Wet Mix Storage Silos*

The company aims to organize maintenance management whose function is to provide company maintenance for the facilities owned by the company, as well as to maintain the stability of the ongoing production process in order to achieve the goals expected by the company..

In this case the company has 2 types of maintenance activities which will be described in the table below.

1. Programmed Maintenance

A maintenance activity that is programmed and is one of the institutional/company activities carried out with future-oriented thinking, control and data collection in accordance with previously determined plans. Included are:

Table 2. Plant Maintenance Activities

No.	Maintenance Activities	Explanation
1.	Preventive Maintenance (Maintenance)	A maintenance activity carried out in a planned and periodic manner in the form of a time schedule, the aim of which is to reduce the possibility of damage, disruption and maintain facilities in standard condition. There are preventive activities that must be carried out daily, such as checking the machine before operation.
2.	Repair Maintenance	A maintenance activity brings a facility to its original standard condition by repairing a previously damaged state. This activity can be carried out in programmed maintenance or non-programmed maintenance. Examples of programmed repair maintenance activities are minor/major maintenance activities, namely minor/major repair activities but this is in accordance with the manufacturer's recommendations as stated in the instruction manual (factory instructions) for the operation of the machine.

2. Non-programmed maintenance

Unprogrammed maintenance is a maintenance activity resulting from damage that occurs outside of planning or unexpectedly, and is not included in the budget. What is included in non-programmed maintenance is generally emergency maintenance, such as sudden machine damage during production activities, so the damaged machine must be repaired immediately to avoid greater losses due to production stopping.

The success of maintenance implementation is measured based on the least frequency and length of time down (facilities are not functioning). So equipment down time due to damage must be avoided wherever possible, through programmed Preventive Maintenance Management. There are several types of maintenance that are often carried out by companies in order to maintain their facilities and component units, which will be explained in the table below.

Table 3. Plant Maintenance Activities

No.	Maintenance	Objective
1.	After Breakdown Maintenance System	The aim of using this method is to save time and costs and repairs are carried out in situations that are really necessary. In this maintenance system, maintenance workers will only work after damage to the machine or equipment occurs. If we use this system, machine or equipment damage will occur many times and the frequency of damage will be almost the same every year.
2.	Routine Maintenance System (Preventive Maintenance)	This type of preventive inspection and repair is made by considering the availability of labor, spare parts, materials for repairs and other factors. Repair costs and the length of time the machine/equipment is out of operation can be minimized compared to repairs to the same machine but carried out after the machine is completely damaged.
3.	Re-Maintenance System (Corrective Maintenance)	Things that are carried out in re-maintenance activities generally occur on equipment or machines that have been in operation for a long time, for example after several years of routine maintenance carried out in the factory, from the inspection data that has been carried out the age and cost of each piece of equipment can be determined, then unit

		priority can be determined. which must be repaired immediately.
4.	Productive Care System	From the several maintenance systems described above, it can be concluded that the higher the efficiency, the higher the profits that will be obtained, so if the high efficiency does not provide the desired benefits.

CONCLUSION

1. The company implements a planned maintenance management system, preventive maintenance management. The success of maintenance implementation is measured based on the minimum frequency and length of time down (facilities are not functioning).
2. Maintenance and repair activities are not only carried out by maintenance or mechanical departments but also by production departments, especially operators, because they are the parties who directly interact with production facilities so they will be more familiar with the condition and behavior of the machines. Meanwhile, the maintenance team is on duty when serious damage occurs that cannot be handled by the operator.

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