CHAPTER 1

INTRODUCTION

Nowadays, markets were influenced by numerous customer need. The power of customer increase in which demand higher customer service level, higher quality, lower price and fast delivery time. Meanwhile, products life cycles were getting shorter. Accordingly, the manufacturing company has moved from labor industry to a high technology industry. A lot of changes in the internal environment of the organization were occurring with high utilization of automation and mechanical of operation such as robots, flexible manufacturing system (FMS), just-in-time concept (JIT) and automatic warehousing. Therefore, as the major component in manufacturing industry was associated with the utilization of machine, the reliability of machine should be considered as the first priority to maintain the effective production (Alshyouf, 2007).

Reliability of machine was the capability of an equipment, machine or system to maintain its specific function or task to fulfill the operational requirement. It was the machine’s ability to operate it the production line without failure or breakdown. The mean time between failures (MTBF) normally used to indicate the probability of failure-free performance over machine cycle life or specific time frame (Douglas et al., 2011).

In recently decades various, barrier was encountered by manufacturing industry. This is due to great competition in the market and the era of globalization. Consequence, the product life cycle will become shorter, drastic changes in manufacturing technology and the various product demands. Machine was the most essential component in manufacturing industry. Even though, machine was becoming more advance and sophisticated, it also not
exempted from breakdown due to regularly usage and aging. The machine that regularly use without maintenance and aging deterioration will cause the major breakdown in the system and out of control. Next, the reliability of machine become low and will effects the production due date and the cost incurred to fix it. Therefore, concentrating on this arising problem was very crucial as the reliability of machine problem cannot be solved easily unless it was designed and planned specially (Houshyar et al., 2015).

The impact of the reliability of machine on operational performance had increased tremendously. Unplanned stoppage and breakdown during operation hour will lead to total output lost for the whole production period. It will not be replaced otherwise additional cost being certified for instances, overtime working. The role of machine’s reliability cannot be denied as it performs its function in maintaining and improving the quality rate, performance rate and availability of the machine itself. Besides, machine’s reliability ensures on time deliveries, highest total plant cost effectiveness and safety requirement in the operation. The disturbances like unplanned stoppage and breakdown in operation caused by maintenance and other will reduce productivity and profitability of the company. Moreover, this low machine’s reliability would result in loss of productivity, failure in providing timely service to customers and might result in safety and environment issues that will give bad image to the company. Thus, there was a need to proof that the reliability of machines greatly contributed to the overall operational (Alsyouf, 2007; Houshyar et al., 2015).

The reliability of the machine was very essential as the main asset in an organization for production. The benefit of machines reliability includes maintaining and increasing the efficiency, performance, availability, quality product, total plant cost effectiveness, environment and safety requirement and ensure on-time deliveries. Every manufacture will face a problem regarding the machine such as a machine breakdown result from wrong usage and aging. However, these constraints should overcome unless it will lead to a low productivity, delay in time and poor customer satisfaction.
1.1 PROBLEM BACKGROUND

Machine reliability plays an importance role in attaining company’s goals and objectives by improving productivity and return on investment of the company. Basically, maintenance has been regarded as less important activity that only incurred a high cost of money instead of producing profit by most organization’s executives or stakeholders. This scenario is due to the blurred perception about its role in achieving company’s goal and objectives (Enofe and Aimienrovbiye, 2010).

Machines were liable to deteriorate relatively the regularly usage and age. This scenario will results in higher production cost and low product quality. Normally, most manufacturing industries implemented preventive maintenance (PM) in the operation to avoid and control the usage and aging among machinery. Preventive maintenance includes scheduled downtime which is perform periodically as a set of tasks containing attributes like repair, cleaning, adjustment, inspection, replacement, lubrication and alignment. However, this practiced seem not enough to determine the root problem that effect on machines (Das et al., 2007).

The machine’s breakdown caused the delays in operation which affect the production rates. Furthermore, its results in reducing the overall productivity of the manufacturing operation and scheduling issues. This scenario shows that the machine’s reliability matter should be considered when operation being conducted (Das and Kader, 2011).

Reliability of machine was the major issues that must be aware of in manufacturing industries. It was the most important component that affects the manufacturing system’s performances. The machine with low reliability will leads to the various problem in the operation. For instances, delays in production and scheduling breakdown problems. In other hand, the machine’s reliability issues bring a different impact on different manufacturing situation. In highly automated mass production system, they were most