

# **CHAPTER I**

## **INTRODUCTION**

This chapter contains of the background of the research, problem formulation, research objectives, scope in research, and systematic of the report. The background contains why this topic become the research. The problem formulation contains the hypothesis of the research. The research objectives contains the objective of the research. The scope of the research contains the constraint of the research. The systematic of the research contains steps in writing this research.

### **1.1 Background**

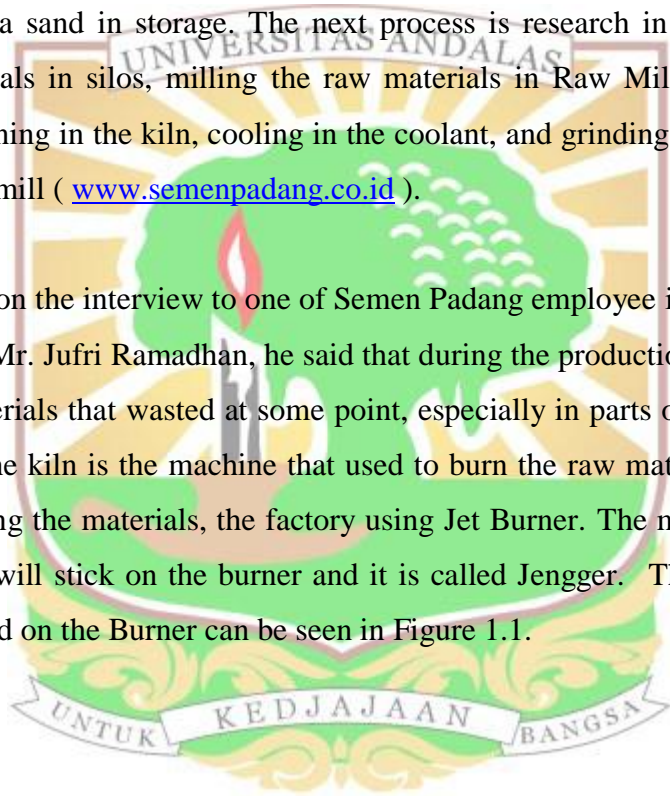
Increasing public demand for various industrial products has led to an increasing number of industrial companies both manufacturing and service industries. This statement based on Kusbiantono (2002) in his journal that if the demand increases the investment increase also. The number of industries in Indonesia continues to increase from year to year. With the increasing number of industries, the level of competition between companies is getting tougher. This is a challenge that must be faced by a company.

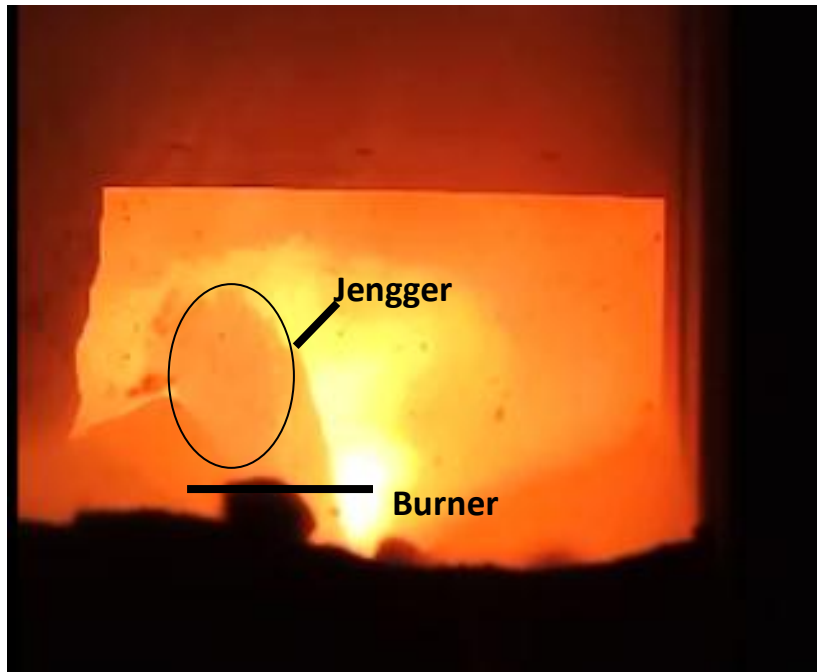
Almost all companies have the same goal, it is increasing the efficiency of the company. There are many ways to improve efficiency, one of them is by controlling the production costs in a company, Rinda (2014). One of the things that affect production costs in manufacturing companies is the efficiency of the production machine, Rinda (2014). If the engine efficiency is low, it will affect the productivity of the company so that the production costs will be greater. One sign that the engine is not working optimally is seen from the production of the machine where there is reject material.

This condition occurs in PT Semen Padang which is engaged in the cement industry. The company was officially founded in 1960 located in Lubuk Kilangan West Sumatra. PT Semen Padang is the largest chemical company in West Sumatra. PT Semen Padang has six production units, namely Indarung I, Indarung II, Indarung III, Indarung IV, Indarung V, and Indarung VI. Indarung VI is a production unit that has higher technology than other production units.

The production processes in the Indarung VI production unit consists of several stages, start with storing raw materials consisting of limestone, clay, iron sand and silica sand in storage. The next process is research in the laboratory, mixing materials in silos, milling the raw materials in Raw Mill, heated in the preheater, burning in the kiln, cooling in the coolant, and grinding all the material at the cement mill ( [www.semenpadang.co.id](http://www.semenpadang.co.id) ).

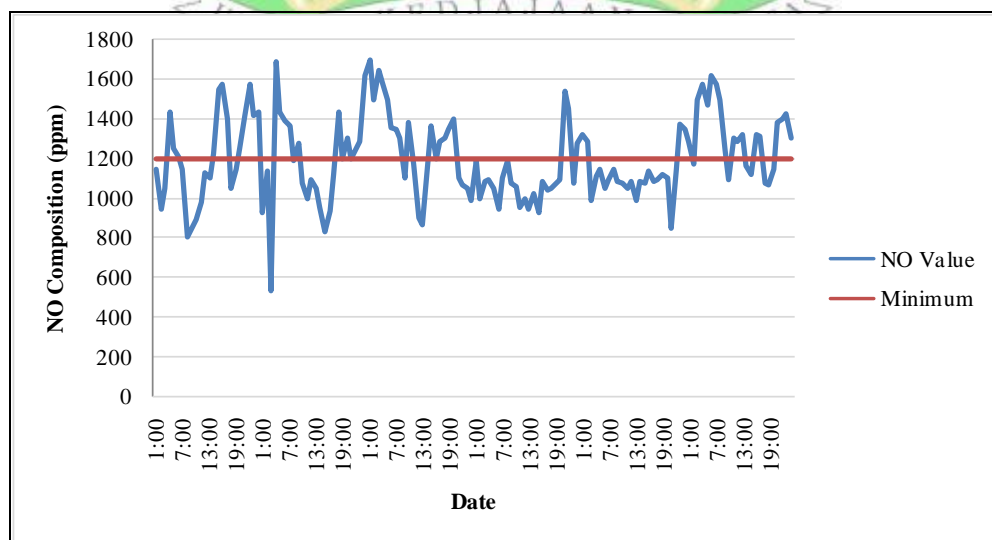
Based on the interview to one of Semen Padang employee in Kiln sector in Indarung VI, Mr. Jufri Ramadhan, he said that during the production process there are some materials that wasted at some point, especially in parts of the jet burner in the kiln. The kiln is the machine that used to burn the raw material from Raw Mill. In burning the materials, the factory using Jet Burner. The materials wasted because of it will stick on the burner and it is called Jengger. The figure of the Jengger stucked on the Burner can be seen in Figure 1.1.





**Figure 1.1** Jengger

Jengger makes the burning process was disrupted. The quality of the materials depends on the composition of Nitrogen Oxide (NO) and NO depends on the amount of jengger. If the amount of jengger increased, the amount of NO is decreased and the quality of the materials (clinker) also decreased. NO is good when the quality of NO at 1200 ppm or above. The data that show the quality of NO when there are jengger and when there is no Jengger can be seen in Figure 1.2.



**Figure 1.2** Composition of NO

The graph shows us there are some data that higher than minimum value of Nitrogen Oxide. From the data, we can say that the problem that occurs because the amount of Jengger is high. Based on Fuel Combustion and Burner Training that held in PT. Semen Padang on July 3<sup>rd</sup>, 2018, the instructor, Pardi Rosyid gave the recommendation to design a tool that can decrease the amount of the jengger.

Based on the above problems, to solve these problems, it is necessary to design a tool that can reduce the number of jengger on a jet burner. With this tool, it is expected that the machines can produce optimal, effective and efficient, so that the quality of cement will be better.

## **1.2 Problem Formulation**

Based on the background, the problem that occurs in the company is the amount of jengger stuck on the top of the burner so that the quality of clinker and production processes is disrupted. The solution of the problem is to design a tool that can help reduce the amount of Jengger that stuck on the top of Jet Burner in Indarung VI PT Semen Padang.

## **1.3 Research Objective**

The objective of this research is to design a tool that can reduce the amount of jengger on the top of the Burner fall into Kiln.

## **1.4 The Scope of The Research**

The scope of the research is the product design process carried out until the detailed design phase including of conceptual design, product cost and the estimation of saved cost of the product.

## 1.5 Systematics of Writing

The systematics of writing this final project report is explained as follows:

### CHAPTER I INTRODUCTION

This chapter describes the background that underlies the final assignment research, problem formulation, research objectives, scope of research, and systematics in writing research reports.

### CHAPTER II LITERATURE REVIEW

This chapter explains the theories relating to problem-solving that you want to do in research.

### CHAPTER III RESEARCH METHODOLOGY

This chapter contains the steps used in conducting research. This chapter consists of preliminary study, collecting data, and designing the tool.

### CHAPTER IV RESULT AND ANALYSIS

This chapter explains the data needed in designing a tool, the process, and stages of designing a tool, and the process of making the tool.

### CHAPTER V CONCLUSION

This chapter contains conclusion, obtained from the results of the research and suggestions for further research.

