# CHAPTER I

# INTRODUCTION

## 1.1 Background

Coal is the world's most important source of energy fueling around 40% of the power stations around the world besides its use as a starting material for many chemical syntheses. It is commonly agreed that coal pits will be mined more intensively and in more numbers in the coming years and that lignite and hard coals will be the major energy suppliers until 2100 (Jangam, 2011). Therefore, the optimal state of coal from the engine and combustion is used.

The high moisture content of low-rank coals (LRC) is a major obstacle to their economic utilization. Such obstacle significantly affects the economics of coal transportation and the efficiency of coal utilization processes, such as combustion and gasification (Junhong, 2016). Low rank coals contain significant amounts of moisture, with moisture contents ranging from 15 to 30 percent for subbituminous coals and from 25 to 40 percent for lignites. High fuel moisture has several adverse impacts on the operation of a pulverized coal generating unit. It can result in fuel handling and maintenance problems, and it increases station service power, unit heat rate, emissions of pollutants, and, for those units with evaporative cooling towers, the consumption of water needed for evaporative cooling (Levy, 2004).

The coal that available in the cement industry has high moisture, so it is not optimal for combustion. So, there is needs some treatment to reduce the moisture from coal. To reduce the moisture people used coal dryer. S V Jangam generally divides the coal dryer into Superheated Steam Drying and Conventional Evaporative Dryers. Conventional Evaporative Dryers contain 10 types of dryers.

In this final project, the analysis of failure on the initial scales by PT.semen Padang then design dryer spin for coal. Currently, coal in imported cement padang has a moisture content of about 40%. Then it will be designed a dryer that will be operated in the industrial environment to reduce the water content. Hence, an indirectly heated rotary dryer has been a common choice.

Rotary dryers were also reported to have higher energy efficiency and lower energy consumption per unit mass of coal dried compared to other conventional dryers such as fluidized bed dryers (FBDs) (Jangam, 2011). So, spin dryers or rotary dryers are suitable for use in Cement Padang because rotary dryers do not use high temperatures in drying.

## 1.2 Aim and Objectives

The objectives of this final project is to obtain CAD design of spin dryer for coal water contant reduction based on stress and strength using finite element analysis.

## 1.3 Benefits

The benefits to be gained from this final project is to get the coal with lower water contant from design spin dryer.

## 1.4 Problem Boundary

There are some things that are not in my influence is the coal that we use is imported by PT. Semen Padang.

## 1.5 Writing Systematical

Generally, the systematical of writing consists of four parts. The first is chapter one introduction. It explains about the background, problem formulation, objectives, benefits, problem boundary, and systematical of writing of the report. The second is chapter two literature review. It concerns about theory related to research that will be conducted. And then chapter three methodology. It contains tools, materials, and the procedure that will be conducted in the research. The last is references, References in research writing for the research.