EFFECT OF DIFFERENT PRESSURE USING SAFETY ANALYSIS FOR POWER TO METHANOL PRODUCTION PLANT

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ABSTRACT

Nowadays, the earth getting worst as the global warming phenomenon being concern especially for the researchers. This phenomenon is due to greenhouse effect particularly emission of the carbon dioxide which is from the industrial process, manufacturing and also deforestation. The technology and innovation play important role to mitigate the concentration of the carbon dioxide in the atmosphere. Thus, the carbon capture approach a technique that absorb carbon dioxide from the flue gas which can produce methanol in presence of hydrogen gas from the electrolysis of water. The utilisation of carbon dioxide attributes various hydrocarbon products that have commercial value. Basically, it is actually a concept power to methanol mainly the methanol is widely used as raw material in plastic industry and alternative fuel. This research project is based on result from the simulation through Aspen Hysis regarding the effect of process condition particularly different of pressure range from 76 bar 442 bar. The data was analysed to evaluate and determine the safety risk of production plant using using probit correlation related to percentage fatality according to fire, explosion and toxicity cases. The research suggested a minimum risk of plant is beyond other considerations such as selectivity, conversion and energy consumption. High pressure of process plant can lead to a major disaster such as fire and explosion if not taking a serious precautions of the process control system

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INTRODUCTION

1.1 Research Background

The emission of concentration carbon dioxide can lead to greenhouse effect which is released through burning oil and also deforestation that give major problem. At the United Nations Climate Change Conference held in Paris at the end of 2016, 195 countries reach agreement on a plan to reduce the release of CO_2 and also greenhouse gases by limit the global heat increment below than 2^{o}C. The emission of CO_2 in the atmosphere is increasing year on year due to burning of fossil fuels. (Thomas R. Anderson, 2016)

The CO_2 emission major sources are from industry and agriculture. As example refineries, construction, mining, energetic industry and waste management. Manufacturing and industrial activities will produce high amount of carbon dioxide . This is because the factory itself use natural gas to generate steam and heat needed for production. Apart from human activities, CO_2 is also released into atmosphere by natural processes like plants, soil, animals and volcanoes. The phenomenon consequences are floods, forests fire as indirectly can effect health, affection and damaged of infrastructures (Bardescu loan, 2015).

One of the approaches to mitigate the negative effect of the climate change and to reduce the emission of CO_2 in atmosphere is by using carbon dioxide capture and storage (I. Sreedhar, 2017). This technology have three main CO_2 capture system that involves with different combustion processes which are post-combustion, pre-combustion and oxyfuel combustion. Post-combustion technology currently is the most preferable and mature process for CO_2 capture compare to the other alternatives. The process to distinguish CO_2 from the flue gas has advantage that can reduce massive amount of