

CHAPTER V

CONCLUSIONS AND RECOMMENDATIONS

This research aims to apply pinch analysis in the chemical engineering industry. Gas separation plant of PTT Company is used as a case study. The integration technique between heat exchanger network and distillation column targeting are very useful to recover heat in the process. Data and information are collected from PTT Public Company Limited at first step. The second step, commercial simulation software, PROII provision is used to simulate and determine thermodynamic properties. Calculation and designing with pinch analysis are the last step to find the optimal modified design options.

By using simulator and concept of pinch analysis, the new design of stabilizer unit can save energy about 47.63 and 17.40 % of cold and hot utilization, respectively by adding side reboiler. Similarly, with process integration, the modification of gas separation unit is adding side reboiler. Two hot process streams were chosen to be used for side reboiler. Option A can improve the energy saving 9.26 and 10.76 % while option B can save 0.70 and 0.82 % of cold and hot utilities, respectively. Finally, the significant range of side drawn tray location to produce Propane and LPG is between tray no.5 to 30 and increasing pressure by 0.3 bars are optimum condition.

There are some suggestions and recommendations of this research work. Firstly, the modification of all topics should be further concerned for impact on the economical and safety constraints. Secondly, the retrofit of gas separation unit can be improved more energy recovery by using total site integration technique. The total site integration is the technique that recovers energy between unit and other units. At present, PTT Company has three gas separation units, GSPI, GSPII and GSPIII. By using this technique, the energy usages will be reduced more. Moreover, using mathematical programming model is the one choice to find the most optimal energy usage design. However, pinch analysis is now universally applied to design of continuous processing plant. The performance of this concept in the plant is an important aspect of energy conservation.