CHAPTER I
INTRODUCTION

As an increase of oil prices and depletion of the world's energy, the energy conservation remains the prime concern for many process industries. For the new industry countries such as Thailand, which has very large energy consumption and the energy sources are imported from foreign country to meet the domestic demand, are effected by the high price of petroleum. From this problem, the reduction of energy consumption is important. The industrial company, which consumes a great amount of energy, is looking for the new way to use the energy effectively.

One way for energy management is process integration. In Specific, pinch technology has demonstrated that good process integration pays off through simplicity of plant design and good use of energy and capital. An essential lesson from pinch technology has been the need to set targets. The principle is to predict what should be achieved (targeting), and then to set out how to achieve it (design). Applications of process integration fall into two categories, grassroots design and retrofit. For modification of existing plants, retrofit is used with the same thermodynamic principles that underlie established pinch technology.

This study uses the process data of Reformer area of The Aromatics (Thailand) Public Company Limited (ATC) with the Pinch technology for retrofitting the heat exchanger network to obtain the best design which results in high degree of energy recovery. This study is divided into two parts. The first part is heat exchanger network retrofit for design case; the second part is the exchanger network retrofit for actual case.

The process of the aromatics plant can be divided into two parts as shown in Figure 1.1, reformer and aromatics areas. This research will be focused on the reformer area that reforms non-aromatic reactant which is condensate or full range naphtha to the aromatic rich products (reformate) and by products such as fuel gas, LPG, H_2 rich gas and light naphtha. The

reformate then will be sent to the aromatics area and converted to Benzene, Toluene and Xylenes which are the major products of ATC plant.

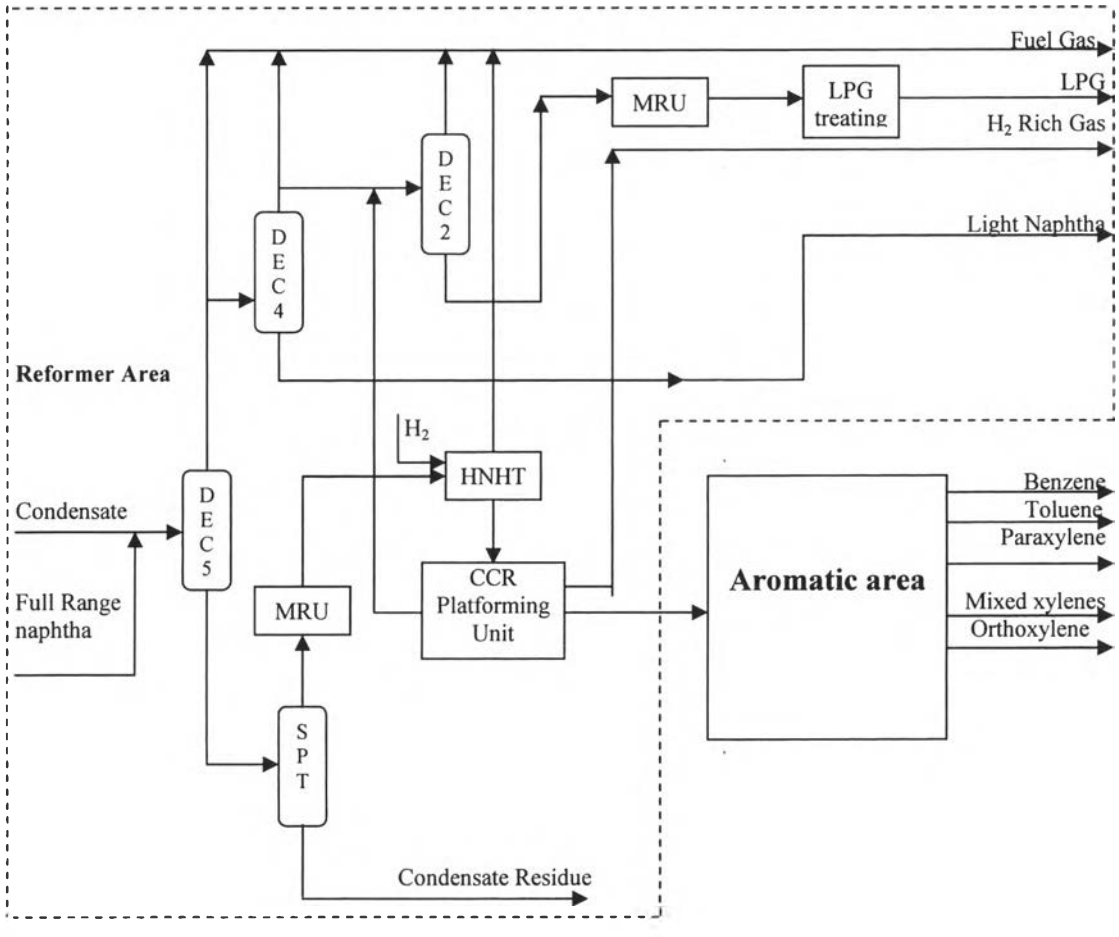

Figure 1.1 The process flow diagram of Aromatics Plant.

The feed can be condensate or full range naphtha containing mercury impurity. The Depentanizer column (DeC 5) is used to separate C_6 and higher compounds from the feed to Splitter column (SPT). The C_6-C_9 fraction from the SPT to remove sulphur will be sent to Heavy Naphtha Hydrotreater (HNHT) and then come to the Continuous Catalytic Regeneration Platforming Unit which reforms the fraction into aromatic-rich product. The product at the top of the DeC 5 will be sent to other units which fractionate distillate and purify C_5 and lower compounds to the valuable and useful products which are Fuel gas (C_1-C_3), LPG (C_3-C_4), H_2 rich gas and light naphtha (C_5-C_6).