

CHAPTER I

Introduction



1.1 The Significance of Oil Loss in Petroleum Industry

Currently the petroleum industry plays a more becoming important role in Thai economy. Each day consumers all over the country utilize a large amount of finished petroleum in various ways, while most of which is used for transportation and in the manufacturing industry. The petroleum product is available through the production of domestic refineries and is imported from overseas countries.

General the petroleum product must be stored in the storage tanks which are located countrywide before being distributed to various petroleum station. Storing is also important for petroleum industry business because it will affect directly the quantity of the product.

The major problem that arise from the storage of this finished oil of distributing company is the loss of oil, while it is stored in tanks and withdrawn from vessels for the purpose of distribution. Whether the oil loss is great or little has direct effects on business running of the company, especially when the loss surpasses the normal level.

1.2 The Featuring of Oil Loss and Its Detection Simulation Program

Oil loss or evaporative loss of oil takes place in two ways. One is an equivalent atmospheric hydrocarbon vapor emissions from volatile stocks stored in

storage tanks, the other is working loss which may be withdrawal loss. Withdrawal loss pertains to the evaporation of liquid stock that cling to the storage tank shell which the stock is withdrawn.

The amount of oil loss depends on different factors e.g. type and size of the storage tank, average annual ambient temperature, average available storage, tank turnover, wind velocity, Reid vapor pressure of product, etc. Several computer programs are developed to estimate the amount of the oil loss per year. However, at present we find that their potential does not reach the satisfactory level and has a lot of limitations, especially an database-supported function.

Most of such programs have to be imported from abroad then its utilization is very limited. This work, therefore, will focus on developing a simulation program which is efficient, suitable for Thailand's condition and costs less than a program bought from abroad.

1.3 The Objective of this Study

- 1.3.1 To develop simulation program for estimating the total oil loss in many kinds of storage tanks.
- 1.3.2 To calculate the value of oil loss for each type of tanks by using the developed simulation program.
- 1.3.3 To analyse the value obtained from the developed simulation program with results of currently used simulation program and the reported loss record from the plant.

1.4 The Scope of this Study

1.4.1 The study is the determination of the oil loss by using computer simulation program which is written in Microsoft Visual Basic language. This program is suitable for the estimation of highly volatile products with Reid Vapor Pressure (RVP) from 6 to 10 PSI and for the study of the following variables :-

- a) Storage temperature of the stock and climate data at the tank location
- b) Vapor pressure of the stock

1.4.2 A database which is developed to support in the program calculation consists of :-

- a) Type of storage tanks :-
 - Fixed roof tank
 - External floating roof tank
 - Internal floating roof tank
- b) Size of the storage tank
- c) Properties of gasoline stock
- d) Thailand 's climate cindition