CHAPTER 2

Inventory Characteristics

2.1 The Definition of Inventory

Every day the actual stock from opening and closing (OP/CL) volume will calculated and recorded stock inventories. This is, of course, only applicable for bulk materials.

The basic OP/CL process is two-step. First, the ambient volume is determined from the calibration tables based on the opening and closing gauge reading specified by the user as well as the density and temperature. Second, use ambient volume, density and temperature converting to reference volume (86°F).

In oil industry business, inventory stock of oil is very important which accuracy of calculation will help specification problem gain or loss of stock.

2.2 The Classification of Error from Calculation Inventory

Error from calculation inventory can occur in every step of operation because of several causes. Error is classified on the job specification into 7 categories as follow.

a) Gauge reading error

b) Temperature reading error

c) API gravity at 60 $^{\circ}$F reading error

d) Calculate CTSh error

e) Calculate FRA error

f) VCF at 60 $^{\circ}$F reading error

g) VCF at 86 $^{\circ}$F reading error

2.3   The Classification of Product and Storage Tank

There are many basic tanks type which are designed to serve a particular need or purpose. The following designs are most common used in the terminal operations:

- Fixed roof tank
- External floating roof tank
- Internal floating roof tank

Fixed roof tank has generally cone or dome shaped roof. Fixed roof cylindrical tank are used for most products other than gasoline. A fix roof tank is a minimum accepted standard storage of volatile liquids.

Internal floating roof tanks are cylindrical vessels that have both a fixed roof over the top of the tank, and a floating deck that rests on the liquid stock surfaces. The use of an internal floating deck will reduced the vapor of volatile products in the space of tanks.

External floating roof tanks having a roof that floats on the surface of the liquid stock. The basic design concept is to reduce the liquid surface exposed to evaporation to a minimum by placing a floating roof in direct contact the liquid surface.

In terminal use fixed roof tank for inventory products fuel oil, gas oil and JET fuel and use floating roof tank for storage products gasoline.

2.4   The Development of Calculation Inventory of Oil

In the past, procedure for calculate inventory of oil not consider the effect of temperature on the steel shell of the tank and use table manual for find value of API gravity at $60^{\circ}F$ and volume correction factor. So factors which effect to calculate inventory of oil is human errors.

Present, several computer programs are developed to calculate the amount of inventory which accuracy more than in the past. However, currently used program that their potential does not reach the satisfactory level because correction for the effect of temperature on the steel shell of the tanks not considered, can not calculate API gravity at 60 $^\circ$F and can not investigate volume correction factor which used calculate reference volume (86 $^\circ$F). Last case is major problem which user not accept currently used program because user not know program calculated wrong value or right value. When user calculate reference volume comparing with currently used program and appearing difference value which user believe procedure of them is correct.

Now we developed program which consider correction for the effect of temperature on the steel shell of the tanks, can calculate API gravity at 60 $^\circ$F and show the volume correction factor which used calculate reference volume (86°F).

Furthermore developed program help user understanding fundamental and equation for calculation inventory stock of oil. In this work, its objectives is to develop the program or calculation inventory stock of oil based on API standard that will be present in next chapter.