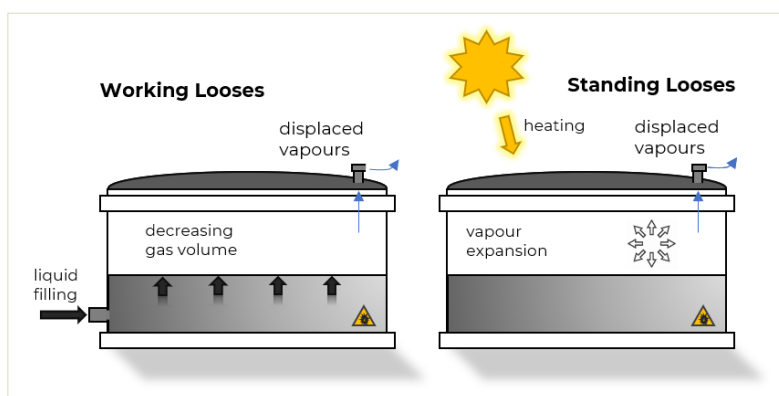


# Improving control over losses and tank emissions through your Production Accounting data

## Overview

Evaporation from fixed and floating roof storage tanks is a major source of product loss in the crude oil industry. Evaporation losses should be minimized to help maximize company revenue, meet regulatory requirements, and reduce greenhouse gas emissions. The accurate quantification of evaporative losses from storage tanks is imperative given the impact to the company's bottom line and the environment. Emissions from storage tanks consist of working losses and breathing losses.

Several international institutes have published detailed methods for calculating losses from storage tanks. However, these methodologies are tedious and time-consuming to the occasional user.



## VM-PA™ Storage Tanks Evaporation Losses

VM-PA incorporates the calculation for storage tank emissions. These emission calculations use equations derived from an August 2001 CEP article by Jimmy Peress. These equations apply for fixed roof tanks and typically deliver results which are usually within 10% of the methodology used by the EPA Tanks 4.09 program.

The VM-PA standard mass loss report is built following the best practices announced by the HM-31 Standard by the Energy Institute<sup>1</sup>. In this line, the Accounted Loss table has been recently added to the VM-PA mass losses report to comply with the HM-31 recommendation: "In order to assist in understanding the variation and reduce loss, it is important to identify known sources or potential sources and one method for this is to construct the Accounted Loss Table. This tables assists good control by identifying changes and allows the refinery to monitor the potential sources of loss and quantify the amount as far as is possible by measurement or calculation or a mixture of both."

Mass losses		VISUALMESA™ PRODUCTION ACCOUNTING	
Model:	DM-SITE - Demo Model - Site		
From:	02/01/2011 00:00:00		
To:	03/03/2011 23:59:59		
Using:	Measured quantities		
User:	Site accountant@as		
Report type:	Summary		
<b>BC-SITE - Balance control - Site</b>			
<b>Processed charges (kg)</b>		<b>Outlets + Consumptions (kg)</b>	
<b>Receipts - Refinery</b>		<b>Shipments - Balance</b>	
05 Gas	21,733,069	20 Liquefied Gas	25,206,937
10 Crude	475,976,657	35 Finished Naphtha	144,429,284
20 Liquefied Gas	3,318,883	55 Finished Distillates	167,229,221
35 Finished Naphtha	9,294,060	60 Heavy Distillates	128,834,956
40 Naphtha Additives	7,009,445	70 Solids	42,999,629
55 Finished Distillates	3,008,597	<b>Subtotal</b>	<b>508,700,028</b>
<b>Subtotal</b>	<b>520,340,711</b>	<b>Consumptions - Refinery</b>	
<b>Inlets - Refinery</b>		00 Gas	18,072,810
80 Miscellaneous	4,910,014	60 Heavy Distillates	5,087,863
<b>Subtotal</b>	<b>4,910,014</b>	<b>Subtotal</b>	<b>23,160,673</b>
<b>Charges inventory</b>		<b>Materials inventory</b>	
Initial inventory	100,115,214	Initial inventory	32,751,667
Final inventory	82,059,244	Final inventory	36,756,591
<b>Inventory difference</b>	<b>18,055,970</b>	<b>Inventory difference</b>	<b>4,004,924</b>
<b>Total processed charges</b>	<b>543,306,695</b>	<b>Total Outlets + Consumptions</b>	<b>535,865,624</b>
<b>Losses results summary</b>			
Total losses	7,441,071	<b>Accounted losses table</b>	
Accounted losses	12,105,305		% total % input
Unaccounted losses	-4,664,234	Flaring	233,576 3.14 0.04
% Total losses	1.37	Losses from API Separator Evap	1,107,563 14.88 0.20
% Accounted losses	2.23	Tank evaporation losses	10,764,166 144.66 1.98
% Unaccounted losses	-0.86	<b>Total</b>	<b>12,105,305</b>

<sup>1</sup> HM-31 Guide to Hydrocarbon Management in Petroleum Refinery Operations, Energy Institute, London, UK.