

** A B S T R A C T **

An Integrated Production, Inventory
and Distribution System for Bulk Products
Marketed By

The National Petroleum Marketing Company

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The contribution of Systems Analysis in the industrial world has greatly increased in recent times. With the world economy in its current state of flux, countries and consequently industries have had to re-organise with a view to optimising operations. The local economy of Trinidad and Tobago has been and continues to be fully dependent on the value of our petroleum resources. On the basis of the interlocked global economy therefore, a revamping of this industry is vital.

In this thesis, a numerical method is presented for the prediction of optimal cost elements for the production, inventory and distribution functions associated with local manufacturing/marketing by

Trinidad and Tobago Oil Company Limited and the National Petroleum Marketing Company respectively.

An integrated approach to refining/marketing is suggested as a strategy to industrial optimisation. Models have been formulated on the basis of the total business cycle, which is described in the text. The 'production model' is based on a mixed integer-linear program which can be analysed as a basic L.P. problem with an assumption of zero set-up costs. Solutions to the distribution and 'order-fit' models can be determined by the use of the transportation algorithm.

The study of the systems in place has revealed areas of duplication of efforts and consequently ineffectiveness in the context of the total petroleum industry. The rationale of decision-making seems unclear and principles are based on diverse factors across the front-lines. World-wide trends dictate the need for vertical integration as a concept for the future viability of industries and operations research methods are considered the ideal tool in problems of profitability. Increased utilisation of this tool is therefore essential for future growth or sustained economic position of the industry.

CHAPTER 1

Data collected has been analysed and is presented in the appendices. A final discussion of the findings is presented and recommendations are proposed in the text.