Title	A linear programming model of the oil refinery
Sub Title	
Author	浜田, 洪一(Hamada, Koichi)
Publisher	慶応義塾大学藤原記念工学部
Publication year	1966
Jtitle	Proceedings of the Fujihara Memorial Faculty of Engineering Keio University (慶応義塾大学藤原記念工学部研究報告). Vol.19, No.76 (1966.) ,p.287(69)- 287(69)
JaLC DOI	
Abstract	
Notes	Summaries of Doctor and Master Theses Master of Engineering, 1966
Genre	Departmental Bulletin Paper
URL	https://koara.lib.keio.ac.jp/xoonips/modules/xoonips/detail.php?koara_id=KO50001004-00190076-0069

A Linear Programming Model of the Oil Refinery

Koichi HAMADA*

Based on the equipment capacity and crude oil availability of certain Japanese petroleum refining company, how to give the optimal scheduling to supply the 10 % of the total Japanese demand for each products of 1967 is proposed.

In making this scheduling, the first step is to make the linear programming model of the oil refinery which is equipped with topping, platformer, vacuum distillation and fluid catalitic cracking. This contains details upon the manufacture of the following 21 end items: liquefied petroleum gas,naphtha, gasoline, jet fuel, kerosene, gas oil, and several kinds of fuel oils. Of the refinery inputs, the following items are considered explicitly: 8 kinds of crude oils, 4 kinds of imported fuel oils and tetraethyl lead.

Within this model, there are numerous possibilities for varying the product mix. At the primary topping stage, there is a choice how much each type of crude is used. Once this selection is performed, the quantities of each type of straight-run material can be determined. Next, at the conversion step (platformer and catalitic cracking), there are choices as to how much of the straight-run materials is sent directly to blending, how much to the individual types of conversion units, and how much the converted materials is sent in turn to other units. Finally, at the blending stage there is considerable freedom in the selection of components for any particular end item.

The restraint matrix of this linear programming model has 131 distinct rows and 244 columns. And the restraint equations are grouped into seven classes: (1) equipment capacity, (2) crude oil availability, (3) maximum saling amount of products, (4) material balance of intermediate items, (5) operational restraints, (6) gasoline blending, (7) fuel oil blending.

The completed linear programming model was run on an NEAC 2800 using ALPS (Honeywell's *Advanced Linear Programming System*).

The reasonable result was attained and sensitivity analysis such as ranging and parametric programming were performed.

*浜 川 洪 一