MATH 340 A Sample Operations Management Problem: Gasoline Blending

It is required to blend 4000 barrels of aviation gas from three available components: Toluene, Alkylate and Pentane. There are certain constraints which must be satisfied by the blend as summarized in the table below:

Constraint	Toluene	Alkylate	Pentane	Product specification
% aromatics	100	0	0	5(minimum)
Reid Vapour Pressure psi	2.0	4.8	19.7	5.5(minimum) 7.0(maximum)
performance no.	100	125	125	115(minimum)
cost per barrel.	$45	$30	$30	

Thus, for example, the first constraint (aromatics) requires us to use at least 5% toluene in order to have a sufficient level of aromatics.

The objective is to find the amount of each resource to use in order to minimize the cost of producing the aviation gas.

What happens if resource specifications or costs or available amounts change?

This problem was given to me by Bill Pulleyblank around 1980 and I am uncertain as to the original source.