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NATIONAL PETROLEUM COUNCIL

TEMPORARY COMMITTEE ON
MILITARY AIRCRAFT FUELS
PRODUCTIVE CAPACITY

September 3, 1947

At the suggestion of MPAC the above Committee conducted an informal poll of petroleum refiners known to produce 100 octane avgas, plus a number of other companies known to have operated alkylation units. The purpose was to collect, rapidly, data on the prospects of fully satisfying avgas requirements, particularly military requirements, for the fiscal years 1948 and 1949.

This document contains a brief summary of the data obtained. It is marked RESTRICTED because it should not be published unless and until approved by NPC. Copies are being sent to NPC's Committee on Military and Federal Government Requirements and to MPAC; also to representatives of each company which participated by supplying data.

A chart is now in preparation showing a breakdown of the same information by company. Copies of such chart, marked TENTATIVE, will be transmitted to each company representative for verification, after which a final edition will be issued to them.

The companies supply data were:

Ashland **	Pan Am *
Atlantic *	Phillips
California (Standard	Pure **
Cities Service	Richfield
Gulf	Shell
Indiana (Standard)	Sinclair
Jersey (Standard)	Socony
including Humble but	Sun *
excluding Aruba	Texas
Leonard **	Tide Water
Ohio (Standard)	Union

* Produce alkylate but no 100 octane avgas
** Produce no alkylate or 100 octane avgas

The data summary is shown below:

100 Octane Avgas
Production and Forecast Production; Sales and Forecast Sales
(in thousands of 42 gallon barrels)

	January through June 1947	Fiscal 1948 Forecast Only
	<u>Estimated</u>	<u>Actual</u>
Production Grade 100/130	4,486	20,214
Production Grade 115/145	712	4,241
Sales to Civilians or for export - Grade 100/130	3,561	10,091
Sales to Military - Grade 100/130	1,498	10,403
Sales to Civilians or for export - Grade 115/145	88	566
Sales to Military - Grade 115/145	639	3,925

Alkylate Production and Disposition
Production and Forecast Production: Disposition and
Forecast Disposition
(in thousands of 42 gallon barrels)

	January through June 1947	Fiscal 1948 Forecast Only
	<u>Estimated</u>	<u>Actual</u>
Production *	11,234	26,453
Blend in Grade 115/145 avgas	454	3,376
Blend in Grade 100/130 avgas	3,574	12,921
Blend in 91 & lower octane avgas	1,191	2,681
Blend in motor gasoline *	5,747	7,204

The above figures are believed to present a reasonably accurate appraisal of the forward position. Nevertheless anyone drawing conclusions from these figures should take in account the following points:

- A. None of the figures for fiscal 1948 represent commitments to the government or to customers. These figures merely reflect present operating plans.

Note: * Since chart was prepared Continental has reported 1947 alkylate production of 198,000 bbls. and estimated 1948 production of 410,000 bbls.

- B. Production compared to Sales. Neither the estimated actual figures for 1947 nor the forecast for fiscal 1948 reflect inventory changes.
- C. Specifications. The data on both avgas and alkylate was obtained from the individual companies without imposing any limiting specifications. Some of the avgas figures represent fuel containing 3 cc/gal. of tetraethyl lead; whereas other material contains 4 cc T.E.L. Since both grades are acceptable and the primary purpose of the poll was to ascertain quickly the practical availability of fuel, this short cut was deemed justifiable.

Similarly, the Committee accepted figures on alkylate production and disposition without seeking alkylate specifications. Obviously - by definition - the alkylate reported as used in avgas must have been aviation alkylate. Most companies reported some alkylate used in motor gasoline (7,203,000 barrels predicted for fiscal 1948) and some small fraction of this material is heavy alkylate unsuitable for avgas. However, some other companies, which are not making avgas, probably use the whole alkylate stream (unfractionated) for that purpose and many companies which produce 100 octane avgas also use alkylate in motor gasoline.

As to fiscal 1948, some companies may distill an aviation alkylate for blending elsewhere. Much of the alkylate blended or to be blended in motor gasoline could be used in blending Grade 100/130 avgas if needed in a national emergency.

- D. Proportion of Alkylate used in Blends. Data from the individual companies on peacetime blending of 100 octane avgas indicates, almost uniformly, a great increase in the proportion of alkylate to total product. This reflects the necessary and desirable trend of "cat cracking" operations toward the production of maximum quantities of motor gasoline rather than the relatively uneconomic wartime practice of producing maximum butylenes for alkylate and maximum avgas base stock. It also reflects the economic unavailability in peacetime of some high octane light hydrocarbons specially produced in wartime.

A few companies (one eastern, one midwestern and several western) having (or producing) special high quality base stocks and light ends use relatively low proportions of alkylate in their blends (reminiscent of wartime); but most companies do not.

Some of the alkylates included in the total figures - particularly those the ethylene-propylene type - are of too low a quality to be used at all in grade 115/145 avgas. Most of the grade 115/145 avgas forecast to be produced will be, substantially, pure aviation alkylate.

- E. Availability of Grade 100/130 100 octane avgas. The civilian and export demand for the first half of 1947 was - if truly reflected by the above figures - about 3,500,000 barrels. The forward estimates for fiscal 1948 indicate a composite intention to sell about 10,000,000 barrels in the same channels. This would represent an increase of 42%. However, depletion of foreign stocks and increased anticipated foreign use might account for a part of this apparent overage.

The military demand for fiscal 1948 is scheduled at 8,066,000 barrels and, against this, the companies polled have evinced an intention to offer about 10,404,000 barrels.

This apparent overage should be regarded with GREAT CAUTION, because:

1. The summary figures, being on a national basis, do not reflect local shortages or long positions;
2. The gasoline is "not made yet";
3. Preliminary estimates of the military's requirements of petroleum products for fiscal 1949 indicate a 50% increase in the demand for grade 100/130. The total production forecast for fiscal 1948 - i.e. 22,000,000 barrels - would be just sufficient to satisfy probable military and civilian demands in the following fiscal year;

4. Most important of all, the situation concerning the availability of grade 115/145 avgas (discussed below must be taken into account.
- F. Availability of Grade 115/145 avgas. The production of grade 115/145 avgas scheduled for fiscal 1948 (4,491,000 barrels) falls far short of meeting military requirements plus the indicated civilian requirement of 565,000 barrels. Fortunately, military estimates of requirements for fiscal 1949 do not indicate an increase in requirements.

Fully meeting the military requirement for the current fiscal year will necessarily involve the use of high quality aviation alkylate in a blending proportion greater than that needed in grade 100/130. Diversion of the theoretical excess of planned production of grade 100/130 for the current fiscal year into a production of additional grade 115/145 to meet the indicated shortage would achieve an approximate balance. This suggests (a) that companies able to make either grade 100/130 or grade 115/145 should increase their offerings of the latter product and (b) that military procurement authorities should continue to give first attention to the latter grade.

It may be noted that the Committee has prepared and will soon circulate a questionnaire designed to answer the question propounded by the military some months ago, concerning the potential all-out production of aviation fuels in a national emergency.

BRUCE K. BROWN