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A.O.(43) 76

COPY NO. 33

13TH DECEMBER, 1943

WAR CABINET

TECHNICAL SUB-COMMITTEE ON AXIS OIL

METHODS OF ESTIMATING MILITARY CONSUMPTION
OF PETROLEUM IN AXIS EUROPE IN 1943

Note by the Joint Secretary

I circulate for information and record the attached comments which have been sent to the Enemy Oil Committee in Washington on the report OSS R and A No.1345, 1,2,3, under the above title. This paper was only circulated to the Admiralty, War Office, Air Ministry and the Ministry of Economic Warfare.

The attached comments also apply to E.O.C.59:⁺ Axis Ground Force Requirements of Petroleum 1943.

(Signed) A.H. BISHOP

⁺ Circulated as A.O.(43) 59.

TECHNICAL SUB-COMMITTEE ON AXIS CIL

Notes on OSS R & A No. 1345, 1, 2, 3

Methods of Estimating Military
Consumption of Petroleum in Axis
Europe in 1943.

A. GROUND FORCE CONSUMPTION

- Para. 1. The comments given below may be read as referring also to E.O.C.59 so far as they are applicable.
- Para. 2. No comments.
and 3
- Para. 4. We agree that the basic intelligence requirements are as given under the headings (a)(b) and (c) on page 3. With regard to (b), it is noted that it is proposed to substitute an activity index for each front for the detailed campaign analysis given in E.O.C.59. We agree that such an index is liable to a wide margin of error, but it is an indispensable basis for the compilation of a monthly consumption estimate, in view of the difficulty of ascertaining the part played by every division in each month's fighting.

The basis for the compilation of such an index will be the estimated milcages of the various classes of vehicles in different types of division for different degrees of activity (Tables IV and V of E.O.C.59). In this index, 100 corresponds to the degree of activity during a "Major Push".

In the British estimates, 100% represents the maximum degree of activity that can be sustained over any considerable period (estimated at 50 miles a day for all the vehicles of a division), while the amount of vehicular activity while the Division is at rest, is represented by 0.(1).

To make the figures for the Infantry Division given in Table IX of E.O.C.59 agree with the basic figures used in our estimates, it must be assumed that:-

| | | |
|-----------------------|---|-------------------------|
| American "Major Push" | = | (British) 125% activity |
| " " "Heavy Fighting" | = | (British) 100% " |
| " " "Rest" | = | " 0% " |

The figures for the three main types of Division then compare as follows:-

| Type of Div. | American Scale | | | British Scale | | |
|-----------------|----------------|----------------|------|---------------|--------------|------------|
| | Major Push | Heavy Fighting | Rest | 125 per cent | 100 per cent | 0 per cent |
| Panzer Div. | 145 | 116 | 14.5 | 130 | 105 | 15 |
| Mechanised Div. | 115 | 93 | 11.5 | 85 | 68 | 12 |
| Infantry Div. | 31 | 25 | 5 | 31 | 25 | 5 |

See Footnote ⁺

Para. 5. The Average mechanisation of Italian Divisions did not exceed approximately 25% of that of the corresponding German types and it is probable that the standard for the satellite countries generally is no higher. Allowing for consequent greater usage of the individual vehicles, it is suggested that the average consumption of satellite divisions might be 50% of that of German divisions, rather than 66%.

Para. 6 It is suggested in this paragraph that, during the winter months - from mid-November to mid-April - 50 per cent should be added to the estimates of consumption on the Russian front, to allow for conditions of mud and snow. The principal factors to be allowed for appear to be:-

1. Increased skid, when travelling, on ice and snow.
 2. Increased rolling resistance, due to mud or soft snow.
 3. Running the engine when the vehicle is stationary, to prevent freezing.
 4. Running with engine too cold for efficiency.
- In our view, the figure of 50 per cent, applied to the whole Russian front over 5 months out of the year, is too large an addition to make for the above factors, in an average winter, particularly as the Germans now employ various methods and gadgets for keeping their engines warm, as well as efficient anti-freeze liquids in the radiators. We have provisionally added an extra allowance of 20 per cent in their estimates for the five months period from mid-November, 1942 to mid-April, 1943.

⁺Footnote 1 (to comments on paragraph 4)

During intensive fighting, a heavy casualty rate, both for men and vehicles, is probable. This is an additional reason for assuming that maximum rates of consumption are unlikely to be sustained for any length of time.

In our calculations, we employ a "very active" rate equal to 125% on our scale for short periods of great activity, but the monthly rate never comes out higher than 100%.

This figure was recommended by the War Office after consultation with the Canadian Forces in this country, who suggested 25 per cent as a suitable addition for ice and snow conditions, based on their own experience in Canada. We should be glad to know whether this agrees with U.S. experience.

Para. 7. The British estimates are framed on the assumption that the proportion of non-divisional to divisional vehicles in the German Army as a whole is approximately 50 : 100.

On the Eastern Front, non-divisional petrol consumption is taken as 60% of divisional and, on other fronts, where the allocation of special troops to corps and other higher formations is on a smaller scale, at figures varying from 30 to 45%.

Para. 8. Consumption by divisional supply units is included in divisional consumption in our estimates.

Para. 9. It is considered that 5% by weight, is a rather low allowance for all lubricants. On the Eastern Front, the figure might vary from 6% in the summer to 6½% in the winter months, inclusive of gear box and axle oils and greases.

Para. 10. It is agreed that special allowances are required for losses during major withdrawals and for sinkings of tankers. Such allowances have been included in the British estimates for 1942-3.

Para. 11. It is believed that the average proportion of light motor fuel to diesel oil in supplies sent to the Eastern front is nearly 5 to 1.

18% is suggested as a provisional estimate of the percentage of diesel to total fuel consumed.

Para. 12. It is considered that, in 1943, producer gas savings have reduced the average consumption of divisions in Germany and Eastern Europe and in Norway and Western Europe to appreciably below the levels suggested.

Para. 13. No comments.

Para. 14. An estimate of the savings of fuel owing to the use of producer gas by Army vehicles has been included in the revised British estimates for the first 3 months of 1943.

B. AIR FORCE CONSUMPTION

We have no comments on OSS R & A No. 1345 1, 2, 3. Our comments on E.O.C. 58 will follow.

C. NAVAL CONSUMPTION

The methods for estimating naval consumption appear to us to be reasonable. We have no comments.