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CENTRAL INTELLIGENCE AGENCY

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THIS IS UNEVALUATED INFORMATION

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1. [redacted]

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<u>Traffic capacity</u>

2. The railroad sections where I worked could be divided into three categories:

<u>1st category</u>, which includes the following sections:

(a) Nezhin - Kiev - Fastov - Kazatin - Zhmerinka - Vapnyarka - Slobodka - Birzula Razdel'naya - Odessa;

(b) Fastov - Mironovka - Tsvetkovo - Bobrinskaya - Znamenka.

(c) Kazatin - Berdichev - Shepetovka.

These sections had double tracks with the heaviest roadbed. Their traffic capacity amounted to 48 train pairs per day, and the weight of the trains were from 1200 to 1500 tons each.

<u>2nd category</u>, comprising the following sections, which are very important for the transportation of freight:

(a) Darnitsa - Grebenka - Romodan;

(b) Odessa - Voznesensk - Pomoshnaya - Znamenka;

(c) Vapnyarka - Khristinovka - Tsvetkovo;

(d) Kiev - Korosten.

The traffic capacity on these sections amounted to 24 train pairs a day, with the weight of trains being from 1000 to 1200 tons.

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3rd category, which comprises all the remaining railroad sections of secondary economic importance:

(a) Fastov - Zhitomir - Novograd Volynskiy;

(b) Kazatin - Pogrebishche - Khristinovka - Uman';

(c) Zhmerinka - Mogilev Podol'skiy;

(d) Zhmerinka - Grechany - Volochisk;

(e) Slobodka - Rybnitsa;

(f) Birzula - Pomoshnaya;

(g) Razdel'naya - Tiraspol';

(h) Pogrebishche - Kalinovka - Starokonstantinov;

(i) Pogrebishche - Zhashkov;

(j) Kamnikovichi - Korosten' - Shepetovka - Grechany - Kamenets Podol'skiy;

(k) Pomoshnaya - Bobrinskaya - Grebenka - Bakhmach.

The traffic capacity of these sections did not exceed 18 train pairs per day with the trains weighing from 800 to 1000 tons each.

Locomotives

3. Freight locomotives series E and ShCh and passenger locomotives series S were in use on the sections of the 1st and 2nd categories; freight locomotives of series ShCh and O and passenger trains of series N were used on the sections of the 3rd category. Unfortunately, technical specifications of the engines escape my memory. However, as far as I remember, weight on axle in locomotives of series E is about 20 tons; in series ShCh, about 18 tons; and in series O, about 14 tons.

Places of repair of cars and locomotives

4. There were special plants for the repair of rolling stock on railroad lines, as follows:

(a) Kiev Car and Locomotive Repair Plant;

(b) Odessa Car and Locomotive Repair Plant;

(c) Bobrinskaya Locomotive Repair Plant;

(d) Darnitsa Railroad Car Repair Plant;

(e) Zhmerinka Railroad Car Repair Plant.

These plants carried out heavy repair work, in the course of which it was necessary to hoist the locomotives. I have no information as to the number of men employed in these plants.

5. Current light repairs on rolling stock were carried on in workshops of the transport service sections located at the following railway stations:

(a) Kiev - Passenger I
(b) Fastov
(c) Kazatin
(d) Zhmerinka
(e) Birzula
(f) Odessa
(g) Golta
(h) Khristinovka
(i) Korosten'
(j) Pomoshnaya
(k) Voznesensk
(l) Nezhin
(m) Grebenka

I have no information concerning the staffs of these workshops either.

Stations

6. The following stations are the most important from a technical and economic point of view:

(a) Kiev
(b) Fastov
(c) Kazatin
(d) Zhmerinka
(e) Birzula
(f) Odessa
(g) Bobrinskaya
(h) Korosten'
(i) Darnitsa

7. All of the above stations are large distributing centers handling a very considerable amount of work. Junction stations of lesser distributive importance are as follows:

(a) Vinnitsa
(b) Vapnyarka
(c) Slobodka
(d) Razdel'naya
(e) Tsvetkovo
(f) Nezhin
(g) Khristinovka
(h) Grechany
(i) Pomoshnaya
(j) Grebenka
(k) Mironovka
(l) Zolotonosha
(m) Berdichev
(n) Pogrebishche
(o) Kalinovka
(p) Shepetovka
(q) Zhitomir
(r) Novograd Volynskiy
(s) Starokonstantinov

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Bridges

8. The largest bridges on the line were over the Dnepr River, located as follows:

(a) On the section, Kiev II - Darnitsa;

(b) On the section, Kiev - Petrovka - Darnitsa;

(c) Near the station of Kanev, on the line Mironovka - Zolotonosha;

(d) Near the station of Cherkassy, on the line Bobrinskaya - Grebenka.

9. All the bridges had many metal spans based on stone piers carrying one track. Their general /obshchaya/ length was more than 1,000 meters each.

10. Less important bridge crossings are:

(a) Over the Pripyat' River, near the station of Mozyr' on the Kalinovichi - Korosten' line.

(b) Over Dnestr River: near the station of Bendery on the Razdel'naya - Bendery line; near the station of Mogilev Podol'skiy on the Zhmerinka - Oknitsa line; near the station of Rybnitsa on the Slobodka - Oknitsa line;

(c) Over the southern part of the Bug River: near the station of Golta on the Birzula - Pomoshnaya line; near the station of Voznesensk on the Odessa - Pomoshnaya line;

11. The above were also single track, 3-4 span, metal bridges on stone piers.

12. During the retreat of the Soviet Army in the Summer of 1941, all these bridges were blown up. The destruction was complete -- all the span structures and part of the abutments were blown up. During the German occupation in 1941-43, the Germans rebuilt some of these bridges and then destroyed them again during their retreat in 1943 and 1944. I have no information as to when and how the bridges were rebuilt by the Soviet authorities.

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The track arrangement

13. The subgrade on the railroad [redacted] was in a quite satisfactory condition, except for some short stretches, where the instability of the subgrade necessitated lowering the established speed of traffic and making continuous expensive repairs of the subgrade.

14. The width of the subgrade for a single-track line amounted, at the top, to 5.5 meters on straight stretches, and for double-track lines it was no less than 9.6 meters; on the curves, with a radius of less than 2,000 meters, the subgrade was wider by 200 millimeters the slopes of the subgrade in normal groups had a gradient of 1-1½. The following provisions for drainage were made in order to secure stability of the subgrade: in the cuts ditches, trenches, and elevated ditches; in the embankments - reservoirs and drainage ditches; when necessary, special drainage installations were constructed to suit each individual case.

15. Under normal topographic conditions, the maximum gradient of the subgrade was specified at 0.008; and the minimum curvature radius, at 300 meters. These standard specifications could vary considerably depending on the conditions of the terrain.

16. The roadbed on the subgrade, consisting of ballast, ties, rails, and bolts, on the railroad [redacted] as well as on the majority of railroads of the USSR network, was in extremely poor condition. This resulted in large amounts of money spent every year to keep the subgrade in a condition ensuring the safety of railway service.

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Ballast

17. The width on the surface of the ballast layer on a single track section had to be 3.10 meters and on a double-track section, 7.20 meters. The thickness of the ballast layer under the ties had to be at least .30 meters, the gradient of the ballast slopes being 1-1½. Only sand of various grades was used for the ballast layer on the majority of railways of the USSR network; gravel ballast was practically non-existent. According to its granulometric consistency, the sand, the use of which for subgrade ballast was authorized, was of two kinds:

(a) Large-grain with a predominance of particles of 1 to 3 millimeters.

(b) Medium-grain with a predominance of particles of .5 to 1 millimeter small-grain sands, as a rule, were not used for subgrade ballast.

18. On some railroad sections, chiefly where the traffic was heaviest, the upper surface of the ballast was covered with a layer of gravel in order to protect the ballast sand layer from being blown away by wind or washed away by rain, and in order to prevent the dust from penetrating into the friction parts of the rolling stock. The ballast on the lines differed considerably in quality and quantity from the standards prescribed by the technical regulations, especially on the railway sections which I included into the 3rd category. The impurity percentage in the ballast, due to the presence of clay, silt, and other admixtures, was extremely high - 20-25%. The thickness of the ballast layer under the ties in many cases did not reach the established standard. I myself saw whole kilometers of railroad track where the ballast layer was not thicker than 0.10 m. while the standard called for 0.30 m. of thickness. The process of cleaning the ballast was extremely slow, because the annual extraction of ballast from the quarries barely covered its normal loss.

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Ties

19. Railroad track on the USSR railways was laid exclusively on wooden ties of various kinds- oak, pine, spruce, cedar, and fir, depending on the species prevalent in the region of the railroad. [redacted] only pine and oak ties were used. All the ties laid for tracks were impregnated with antiseptics; this procedure was compulsory.

20. Depending on size and shape, the ties were divided into the following types:

(a) Trimmed - types IA, IIA, IIIA, IVA, and VA.

(b) Square - types IB, IIB, IIIB, IVB, and VB.

(c) Rectangular - IC, IIC, and IIIC.

Rectangular ties were used only for the support of joints on the double ties. 50X1

21. The cross measurements of ties varied between 17.5 centimeters in height, 16.0 cm. in width at the top and 25.5 cm. at the bottom for ties IA and IB, to 13.5 cm. in height, 13.0 cm in width at the top and 21.5 cm. at the bottom for ties types VA and VB. The height of the rectangular ties was equal to that of the corresponding types of the trimmed and square ties, but the width of their surfaces, equal for all three types, was equal to the width of the bottom side of ties of the types VA and VB. The length of ties of the types I, II, III, and IV was 2.70 meters and that of type V, 2.5-2.7 meters.

22. Depending on the amount of traffic and the type of rolling stock in use, the number of ties per one kilometer of USSR railroads could be 1440, 1600, and 1840. On the road [redacted] into the 1st and 2nd category, the number of ties per kilometer reached 1600 while on the sections of the 3rd category it was 1440. There were no sections having 1,840 ties per kilometer [redacted] The number of ties under one length of rail depended upon the general number of ties per kilometer and upon the length of rails. For instance, on a section where there were 1,600 ties per kilometer, there were 17 ties under a rail 10.67 meters long; and under a rail 12.50 meters long there were 18 ties. As I mentioned above, the tie situation on all USSR railroads, [redacted] was extremely bad, especially on the railroad sections of secondary importance; the number of defective ties lying on tracks amounted, on individual kilometer-lengths of the sections in the 3rd category, to 18-20%. Annual replacements barely covered the normal wear and tear, allowing practically no margin for improvement of the condition produced by long neglect.

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Rails

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23. The rails on USSR railroads are extremely varied in type, since in old times every railroad used its own type of rails. Attempts to standardize the type of rails resulted in establishing one standard, divided into 4 basic types: Ia, IIa, IIIa, and IVa. During the last few years preceding World War II, the industry ceased to roll rails of the lighter types IIIa and IVa, and so the basic type of rails Ia and IIa was established. However, since replacement of the rails of old types proceeded extremely slowly, a great number of rails of the old types lay about on the USSR railroads up to the very beginning of World War II.

24. The length of rails of the types Ia, IIA, IIIa, and IVa of the old rolling was 42 feet or 12.80 meters, and 35 feet or 10.67 meters. Lately, the normal length of 12.50 m. was fixed for these rails.

25. The basic characteristics of the standard types of rails were as follows:

Type of rail	Weight of 1 meter of rail in kilograms	Height of rail in millimeters
Ia	43.57	140
IIa	38.42	135
IIIa	33.48	128
IVa	30.89	120.5

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26. The sections of the railroad included in the 1st category, [redacted] were laid with rails of type IIa; the sections in the 2nd category, with rails of types IIa and IIIa; the sections in the 3rd category, with rails of types IIIa and IVa, as well as with rails of obsolete types. There were no rails of type Ia. The gauge between the internal edges of the head of a rail amounted, on straight stretches of track, to 1,524 millimeters. The widening of the gauge on curves depended on the radius of the curve and was fixed as follows:

(a) For a radius of 650 meters and more 1,524 mm

(b) For a radius of 450-650 meters 1,530 mm

(c) For a radius of 350-450 meters 1,535 mm

(d) For a radius of 350 and less 1,540 mm

27. Variations from the established width of the gauge were permitted up to plus 6mm. and minus 2 mm.; in this way, the gauge could not be under any circumstances more than 1,546 mm or less than 1,522 mm.

28. The rail situation of the USSR railroads, as well as that of ties, was extremely bad. The USSR industry was unable to meet the yearly demand for rails; therefore, the rails on tracks were very old and very much worn out. Old, worn-out rails were moved from more important sections of the tracks to the less important ones, and from the latter to station yards. Cases where all the rails were replaced with new ones were extremely rare and that on comparatively small sections.

Joints

29. According to regulations, the rail joints of the standard types Ia, IIa, IIIa, and IVa required joint bars with 6 holes, but, owing to the shortage of bolts, many sections could be found with joints with 4 bolts only. Old type rails were joined by 4-hole joint bars.

30. Under the rail, 3-hole tie plates were laid on ties, and the rail was fastened to the tie with 3 spikes. On secondary sections with rails of the old type, 2-hole plates could be found; sometimes they were absent altogether, and the rail would be fastened to the tie with only 2 spikes. Many broken joint bars, tie plates, and spikes with eroded necks could be found on the tracks; in general, all the joints were greatly worn out and not always complete.

Switches

31. Switches on USSR railroads, like rails, were of many different types and, as a rule, corresponded to the type of rails; the frog angles mostly used on main lines were 1/11 and 1/9; in railroad yards it was 1/8 and in any case not sharper than 1/6.

32. The length of radius of the transition curve for the above mentioned types of frogs ranged more or less within the limits shown below.

(a) For an angle of 1/11, the radius of the curve was 270-320 meters

(b) For an angle of 1/9, the radius of the curve was 190-220 meters

(c) For an angle of 1/8 the radius of the curve was 170-180 meters

The Productivity of Labor

33. All types of work on tracks were performed by special brigades of track workmen. Track brigaders (artel' foremen) and railroad foremen supervised the work of these brigades. These men, who represented the lower administrative and technical personnel of the Communication Service, were responsible for the condition of the tracks on a comparatively small section of the road (a brigader was in charge of a sector of 4-5 kilometers; a

railroad foreman had 3-4 brigades under him). Until the beginning of the thirties, cadres of old experienced track workers still remained with the railroads. Beginning with the thirties, approximately, a number of railroad purges and the subsequent reorganization of the system of administration wrought havoc among the cadres of qualified railway men, from the upper administrative and technical personnel down to the brigades, who were replaced by low skilled workers chosen for their Party reliability. At the same time, the rank and file railroad workers who had been recruited mostly from among the cadres of qualified railway men, from the upper administrative and technical personnel down to the brigades, who were replaced by low skilled workers chosen for their Party reliability. At the same time, the rank-and-file railroad workers who had been recruited mostly from among the local peasant population began to desert the railroads in great numbers because of the Soviet policy in the villages (collectivization).

34. During the period of 1930-1941, the technique and the methods of work on tracks were on the level of those prevalent at the end of the last century. The tools and equipment in use were almost identical with those used 30-40 years previously. Under such circumstances, the conditions necessary for high productivity of track work could not be developed. In the middle of the thirties, principles of mechanization of track work began to be introduced, but did not meet with any sympathy or cooperation on the part of the poorly qualified railroad personnel. The result of this attitude was that the few machines that were available for track work were rarely used, and not very efficiently. There were many cases when these machines, handled by low-skilled and untrained personnel, broke down immediately. The old methods, where physical force and skill of the workman played the most important part, had to be re-introduced. However, in all justice, one must admit that under such circumstances brigades of railroad workers achieved an extremely high level of productivity. This high productivity was achieved exclusively by using the exhaustive "sweatshop" system called in the USSR "the socialist methods of work" -- Stakhanovism, shock work, and Socialist competition. Another factor of no small value in this respect was that track work was paid on a piece-work basis, plus bonuses. Such a pay system can hardly be considered, from a technical and economic view point, as expedient, because in most cases it results inevitably in considerable deterioration in the quality of work.

35. As I mentioned at the beginning, the only source of information is my memory - as far as it goes - since, unfortunately, I have neither textbooks nor reference books at hand. The data I have given refer approximately to the period of 1930-1941, because after that 50X1 I obtained no information whatsoever about the condition of the railroad transport.

36. [redacted]

37. My conclusion is based on the simple reasoning that USSR industry, which only with difficulty met the demands of transport in peace time and which suffered tremendous destruction during World War II, cannot meet the enormously increased demands of the railroad transport caused by the war's devastation.

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