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# USSR Report

TRANSPORTATION

No. 87

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AIR

NEW ROUTES OPENED BETWEEN MOSCOW, MONROVIA, BUJUMBURA  
Moscow-Monrovia

Moscow VOZDUSHNYY TRANSPORT in Russian 27 May 82 p 3

[Unattributed report: "Guests from Liberia in Moscow"]

[Text] A delegation from the Republic of Liberia led by minister of commerce, industry and transportation E. Sumo Jones, is in Moscow at the invitation of the Ministry of Civil Aviation on the occasion of the inauguration of an air route between Moscow and Monrovia.

On 26 May the delegation was received in the Ministry of Civil Aviation. During the meeting questions of the further development of Soviet-Liberian cooperation in the field of air communications were discussed.

Moscow-Bujumbura

Moscow VOZDUSHNYY TRANSPORT in Russian 8 Jun 82 p 4

[Own correspondent A. Baturin report: "The Moscow-Bujumbura Route"]

[Text] A TU-154 aircraft has returned to Moscow after the first (technical) flight on a new international air route between Moscow and Bujumbura (Republic of Burundi). This Central African country has become yet another of the states in the world to which Aeroflot airliners will make regular flights.

Some days ago the diector of the Sheremet'yevo-2 airport invited passengers to take their seats aboard the TU-154 flying from Moscow to the capital of the Republic of Burundi. The aircraft was manned by a crew made up of experienced pilots from the Central International Air Services Administration: captain N. Shivarnov, second pilot G. Kuzichev, navigator B. Klyuchko, flight engineer A. Groshev. The flight was under the command of V. Voronin, chief of the TU-154 section at the Central International Air Services Administration.

The silver airliner quickly gained altitude and set up its flight course. Some 9 hours and 20 minutes later, after intermediate landings at Cairo and Nairobi, the comfortable, high-speed TU-154 came in to land at Bujumbura after flying the 7,980 kilometers of the new mainline air route.

This is what the flight commander, pilot 1st class Vladimir Voronin said: "African routes have already been firmly opened by Aeroflot for a long time. It is pleasing to make this correction to the schedule for international flights. We should note that the appearance of the Soviet airliner in the capital of Burundi evoked great interest. At the Bujumburu airport (located in a picturesque valley between mountain ridges and the wonderful Lake Tanganyika) it was not only the local inhabitants who gathered to have a look at modern Soviet aviation technology; the parking lot in front of the airport was dotted with national flags on the hoods of vehicles from the diplomatic missions. A press conference was held right there on the airfield, and then all who wished were able to board the TU-154 and make a tour of it with our help. [no closing quotes]

The local newspapers highly assessed the Soviet aircraft, calling it a most pleasant airliner whose dashing lines are completed with a strict regularity, like a musical scale." The opening of the Moscow-Bujumburu route is assessed as a major event in the life of the country and a significant contribution to the development of friendly relations between the USSR and the Republic of Burundi.

9642

CSO: 1829/248

AIR

#### BRIEFS

FRUNZE FLYING SCHOOL--Kirgiz SSR--The Frunze Aviation-Technical School trains highly qualified personnel for civil aviation. In 8 years it has trained many hundreds of class-qualified airport services specialists who are now working in all parts of the country. This training establishment can rightly be called a forge for international personnel. Young people of more than 40 nationalities master the aviation professions here. They include representatives from Mongolia, Vietnam and the African countries. Young people from the famous aviation republics pass on their own rich experience here. Our pictures show students on courses at the school, (left to right), E. Iskhakov, and (B. Dambyn) and (M. Bekhtor) from Mongolia, together with Yu. Kurov and A. Zhalaldinov; students of the second course are studying an aircraft engine. [Text] [Moscow VOZDUSHNYY TRANSPORT in Russian 8 Jun 82 p 4] 9642

IL-76T FLIGHT TRAINING--Preparations for operation of the IL-76T airliner have been underway for some years at the CEMA Civil Aviation Center. The first to do the conversion were instructors from the flight training section Hero of the Soviet Union N. Mart'yanov, V. Semenov, V. Mitrofanov, A. Gendelevich, V. Voinov and V. Fedorov. The up-to-date equipment in the new building for the laboratory training corps has made it possible to improve substantially the process of theoretical training, and in the future use will be made here not only of traditional visual aids like diagrams and posters, but also photo displays and slides. An electrically operated mockup of the aircraft has been set up for classroom studies, and two technical training classes have been organized. The training process has been considerably enlivened since the arrival of the first IL-76T. Experienced flight instructor in the flight training section, P. Nikitkov, was the first in our collective to convert to this type of aircraft. The training program has also been completed by the crew of one of the flight subdivisions headed by V. Korchevskiy. [By N. Shul'zhenko] [Text] [Moscow VOZDUSHNYY TRANSPORT in Russian 29 May 82 p 3] 9642

UST'-KUT FLYING ACTIVITIES--Fliers in Ust'-Kut have had their hands full this year. They have started to service organizations such as "Yakutskgazneftgelogiya," "Vilyuygesstroy" and others. Each day the local airport accepts up to 10 large IL-76 freighters. The collective of the aviation enterprise have coped ahead of schedule with the planned tasks for the first quarter of the second year of the 11th Five-Year Plan for all indicators. The aviators are dedicating their successes to the 60th anniversary of the formation of the USSR [By Yu. Shumaylov] [Text] [Moscow VOZDUSHNYY TRANSPORT in Russian 1 May 82 p 2] 9642



TYUMEN FLYING ACTIVITIES--Tyumen--The contribution made by the IL-76 collective at the Tyumen Aviation Enterprise (Roshchino) for the collection box of the "red Saturday" will be 11 flights to Nadym. The pilots are already close to their stated intention of carrying 325 tons of freight. The first such flight was made by the crew of holder of the Labor Red Banner B. Kuznetsov. He has delivered 65 tons of freight to Nadym. A total of about 350 crews from the Tyumen Administration of Civil Aviation spent the subbotnik in the sky. Some 130 of them flew on fuel that had already been saved, and about R12,000 were posted to the holiday fund. The total contribution made by the Tyumen fliers was more than R60,000 [By A. Mokrousov] [Text] [Moscow VOZDUSHNYY TRANSPORT in Russian 15 Apr 82 p 1] 9642

CSO: 1829/248

RAILROAD

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ANALYSIS OF VALUE OF FIXED CAPITAL, ITS USE

Moscow ZHELEZNODOROZHNYI TRANSPORT in Russian No 1, 1982 pp 58-61

[Article by candidate of economic sciences N. G. Smekhova and engineer Yu. N. Kozhevnikov: "Improve Methods of Evaluating the Use of Fixed Capital"]

[Text] Improvement of work in all sectors of railroad transportation and handling the growing volume of shipping in the 11th Five-Year Plan will depend greatly on fuller utilization of production reserves, efficient use of capital investment and fixed production capital, insuring economies of working capital, electrical energy, and fuel, and improving economic work at all levels of management of the shipping process.

In the 11th Five-Year Plan railroad transportation faces a large program of comprehensive development: new construction; increasing the size of rolling stock and the reliability of locomotives; increasing the weight and traveling speed of trains; building up repair facilities; updating and refining the structure of the fleet of cars; strengthening the road system and improving its technical-economic indicators; and, development and technical equipping of stations and other sectors of the transportation system. To carry out the assigned tasks it will be important not only to improve the efficiency of new capital investment, but to use existing capital intensively and economically and increase the output from each ruble of capital used.

Table 1 below shows change in indicators adopted for analysis and evaluation of the use of the fixed production capital of the railroads such as the capital-labor ratio and the output-capital ratio. As the table shows, in the period from 1970 to 1979 capital per kilometer of railroad line increased 42.8 percent and capital per employee rose 36.1 percent, while the quantity of output per ruble of fixed capital declined from 54.29 to 49.48 ton-kilometers, which is 8.9 percent. The values of these indicators were significantly affected by the rate of growth in the value of fixed production capital and volume of shipping, change in the proportions of freight and passenger traffic, the ratio of electric and diesel traction in handling shipping volume, the structure of production capital, change in the qualitative indicators of the use of rolling stock, and other factors.

Table 1

Indicators	1970	1975	1979
Capital Availability, rubles/km	376,300	459,600	527,800
Capital-Labor Ratio, rubles/person	25,500	30,800	34,700
Output-Capital Ratio, calculated ton-km/rubles	54.29	55.67	49.48

It is common knowledge that the amount of fixed capital per unit of conveyance (capital-intensiveness of conveyance) differs for different types of transportation. Thus, the average capital-intensiveness of conveyance for the entire system is 20.2 kopecks per 10 calculated ton-kilometers, but for passenger conveyance it is 60.724 kopecks per 10 passenger-kilometers and for freight conveyance it is 16.135 kopecks per 10 ton-kilometers. In other words, the capital-intensity of passenger conveyance is 3.8 times greater than for freight.

With the existing reporting system, analysis of indicators of the use of fixed capital can only determine indicators for the full volume of conveyance. To take account of the influence of the volume of conveyance, the ratio of freight and passenger conveyance, and conveyance performed on sections with electric and diesel traction, however, special calculations to distribute the value of fixed capital by types of conveyance and types of traction are necessary.

At the present time there are several ways to distribute the value of fixed capital by types of conveyance and types of traction. They are based on the data from reassessment of fixed capital. Thus, the value of the fixed capital allocated to freight conveyance by the methodology of the Central Scientific Research Institute of Information and Technical-Economic Research and Propaganda for Railroad Transportation, using 1972 figures, is 67.1 percent. Using the methodology of VNIIZhT [All-Union Scientific Research Institute of Railroad Transportation] and 1972 figures it is 74 percent, but with the methodology of MIIT [Moscow Institute of Railroad Transportation Engineers] and 1962 figures freight conveyance was assigned 72-81 percent of the value of fixed capital. The main reason for these differences is methods of distributing structures, transmission facilities, and buildings by types of conveyance.

The proposed methodology is based on current report data, in which consolidated groups of fixed production capital are singled out in form B0-3 (see Table 2 below). The use of current report figures to analyze the use of fixed capital is necessitated by the fact that there is a period of more than 10 years between inventories. During this time the working conditions of the railroads and the value of fixed production capital change significantly in relation to changes in the level of prices for new capital, the construction and launching of new lines, and the introduction of more progressive forms of traction.

Calculations made earlier distributed fixed capital by types of conveyance first, and then by types of traction. In this methodology we propose to distribute the value of track structures separately into main tracks and station tracks, and then distribute the value of the main tracks first by types of traction and secondly

Table 2

Group, Type of Capital	1979, %
Buildings . . . . .	5.7
Structures . . . . .	51.9
Included in Above:	
Roadbed . . . . .	10.9
Track Superstructure . . . . .	27.1
Metal Bridges with Spanning Structures More than 25 Meters Long . . . . .	2.9
Transmission Facilities . . . . .	5.0
Machinery and Equipment . . . . .	5.7
Means of Transportation . . . . .	31.1
Tools, Production and Administrative Equipment, and Other Forms of Fixed Capital . . . . .	0.6
<b>Total Fixed Production Capital . . . . .</b>	<b>100.0</b>

by types of conveyance. The reason for this order is that the density of traffic on electrified lines is much higher than on non-electrified lines. On some sections of lines with electric traction freight intensity exceeds 100 million net ton-kilometers per kilometer while the average for the railroad system is about 26.2 million calculated ton-kilometers per kilometer.

Naturally, the high freight intensity requires the use of more heavy-duty and expensive types of roadbed and superstructure. To take this difference into account the coefficient  $K_g$  for calculating freight intensity is introduced. It is equal to the ratio of freight intensity on sections with electric traction to the freight intensity on sections with diesel traction. This coefficient and the average share of dependent capital are used to figure calculation coefficients for the main tracks by roadbed and superstructure and the length, calculated by value, of lines with electric and diesel traction separately for roadbed and track superstructure. The value of the roadbed and superstructure of the main tracks are distributed by types of traction proportional to these quantities. The value of the roadbed and superstructure of station tracks is distributed first by types of conveyance, and then by types of traction.

Methods of distributing the value of track structures on station tracks by types of conveyance requires special investigation. But in our opinion, it is wiser to distribute this value by types of conveyance proportional to the length of station track necessary to handle cars, and not in the way adopted today, which is proportional to calculated car-kilometers equal to the car-kilometers of freight cars and multiplied by the factor 0.33, the car-kilometers of passenger cars, or proportional to expenditures for shunting work (articles 3, 21, and 22). This kind of distribution causes an artificial lowering of the value of capital assigned to passenger conveyance because it only considers the time of shunting work or expenditures on it for different types of conveyance. By this method

freight conveyance received 97.3 percent of the total value of the fixed production capital on station tracks and passenger conveyance received 2.7 percent. The volume of shunting work in passenger traffic is small, but the time that station tracks are occupied is relatively higher because of downtime for passenger cars at forming and turnaround points, when held in reserve owing to uneven traffic, and for other reasons.

A distribution of the value of the roadbed and track superstructure by main tracks and station tracks was made following the above principles of the proposed methodology. In doing this the value of one kilometer of roadbed and superstructure for station track was taken to be 0.63 and 0.67 of the value of the structures on main track. Then the length of track for roadbed calculated by value will be determined as  $l_m + 0.63 l_s$ , while for the superstructure it will be  $l_m + 0.77 l_s$ .

After determining track length calculated by value the value of track structures is distributed for station track by types of conveyance. According to the methodology adopted and using 1979 data 5.9 percent of the value of track structures on station tracks was assigned to passenger conveyance. In this case the fixed capital for station track allocated to passenger conveyance increases from 2.7 percent (according to methodologies proposed earlier) to 5.9 percent.

To distribute the value of the roadbed and superstructure of main track by types of traction the coefficient  $K_g$  is calculated. For 1979 data it is 1.98 in sections with electric traction and 1.0 in sections with diesel traction. The coefficients of calculation for freight intensity using 1979 data for sections with electric traction are  $0.7 + 0.3 \cdot 1.98 = 1.29$  for the roadbed and  $0.6 + 0.4 \cdot 1.98 = 1.39$  for the track superstructure where 0.3 and 0.4 are the average shares of capital dependent on volume of conveyance for the roadbed and track superstructure respectively.

Multiplying the extended length of lines with electric and diesel traction by the coefficients of calculation for load intensity, we obtain the extended length of roadbed and superstructure of main tracks calculated by value, and their value by types of traction is distributed proportional to this length. Table 3 below gives the results of the distribution of the value of the roadbed and superstructure of main tracks by types of traction.

Table 3

Track Structures	Types of Traction	
	Electric	Diesel
Roadbed	43.0	57.0
Track Superstructure	44.9	55.1

After this the value of the roadbed and superstructure of main tracks is distributed by types of conveyance according to the methodology developed at VNIIZhT.

In this case 40 percent of the value of the superstructure of main tracks is distributed proportional to gross ton-kilometers and 60 percent of their value plus the value of the roadbed is distributed proportional to locomotive-kilometers at the head of trains and traveling alone, with due regard for the output ["s'yem"] coefficient.

According to the proposed methodology for distributing the value of fixed capital by types of conveyance 54.1 billion rubles or 73 percent of the value of fixed production capital was assigned to freight conveyance and 20.4 billion rubles or 27 percent to passenger conveyance. The average capital-intensity of freight conveyance is 16.135 kopecks per 10-ton kilometers; the capital-intensity of passenger conveyance is 60.724 kopecks per 10 passenger-kilometers, and the capital-intensity of 10 calculated ton-kilometers is 20.196 kopecks.

Table 4 below shows comparative results of the distribution of the value of track structures by the proposed methodology and methodologies proposed earlier (in percentage).

Table 4

Track Structures and Types of Traction	VNIIZhT Methodology Conveyance		Proposed MIIT Methodology Conveyance	
	Passenger	Freight	Passenger	Freight
Roadbed	37.7	62.3	36.1	63.9
Included in Above:				
Electric Traction	22.5	31.3	18.1	24.9
Diesel Traction	15.2	31.0	18.0	39.0
Track Superstructure	26.8	73.2	26.0	74.0
Included in Above:				
Electric Traction	16.0	36.8	13.5	31.4
Diesel Traction	10.8	36.4	12.5	42.6

As can be seen from Table 4, the share of capital allocated to sections with different types of traction changes very significantly. Thus, according to the proposed methodology the share of fixed capital allocated to diesel traction for the roadbed increases by eight percent for freight conveyance and 2.8 percent for passenger conveyance, while the figure for track superstructure is up 6.2 percent for freight conveyance and 1.7 percent for passenger conveyance. The share of capital allocated to sections with electric traction decreases, and so also does the capital-intensiveness of this type of transportation.

The value of the roadbed and track superstructure constitutes about 38 percent of the total value of fixed production capital, and therefore when the method of distributing these groups of fixed capital by types of traction is changed there is a significant change in the capital-intensity of conveyance in sections with different types of traction. Table 5 below shows the results of distributing the value of fixed production capital by types of traction.

Table 5

Indicators	VNIIZhT Methodology*			Proposed MIIT Methodology		
	Total	Electric Traction	Diesel Traction	Total	Electric Traction	Diesel Traction
Freight Conveyance						
Fixed Production Capital, millions of rubles	54,122.5	26,660.6	27,461.9	54,111.7	25,067.3	29,044.4
Fixed Production Capital, %	100.0	49.3	50.7	100.0	46.3	53.7
Capital-Intensity, kopecks/10 ton-km	16.139	14.861	17.622	16.135	13.973	18.638
Passenger Conveyance						
Fixed Production Capital, millions of rubles	20,349.8	11,441.3	8,908.5	20,360.7	10,826.0	9,534.7
Fixed Production Capital, %	100.0	56.2	43.8	100.0	53.2	46.8
Capital-Intensity, kopecks/10 passenger-km	60.692	54.260	71.736	60.724	51.342	76.778

\* The distribution of fixed capital by types of conveyance is done according to the VNIIZhT methodology; distribution by types of traction was done according to a methodology developed earlier at MIIT.

Capital-intensity on sections with diesel traction when distributing the value of track structures by the proposed methodology increases for freight conveyance from 7.622 to 18.638 kopecks per 10 ton-kilometers or 5.8 percent, while for passenger conveyance it rises from 71.736 to 76.778 kopecks per 10 passenger-kilometers or 7.0 percent. Capital-intensity of conveyance in sections with electric traction decreases from 14.861 to 13.973 kopecks per 10 ton-kilometers or 6.0 percent for freight conveyance and from 54.260 to 51.342 kopecks per 10 passenger-kilometers or 5.4 percent for passenger conveyance.

The magnitudes of capital-intensity by types of conveyance when capital is distributed by the methodologies under analysis changes only slightly (see Table 5), but on sections with different types of traction the structure of capital-intensity by the principal groups of capital changes significantly. To calculate the amounts of capital per unit of measure it is necessary to distribute the value of fixed production capital into capital that depends on the volume of conveyance and capital that is hypothetically constant. According to calculations that have been made, 55.1 percent of the value of fixed capital for freight conveyance is allocated to dependent capital on sections with electric traction and 56.5 percent on sections with diesel traction; the ratios of hypothetically constant capital to dependent capital are 109.6 percent on sections with electric traction and 96.5 percent on sections with diesel traction.

To determine the influence of qualitative indicators of the use of rolling stock on the capital-intensity of conveyance it is necessary to determine the amounts of capital allocated per unit of the following measures: car-hours, locomotive-hours, shunting locomotive-hours, and locomotive-kilometers at the head of trains and traveling alone. The value of the cars, train locomotives, and shunting locomotives (switch engines) and the dependent part of value of the roadbed and track superstructure of main and station tracks, transmission facilities, machinery and equipment, buildings, and bridges is allocated to these measures.

Table 6 below gives the amounts of capital allocated per unit of measure by sections with different types of traction.

Table 6

Measures	Rate of Fixed Production Capital by measures, rubles					
	Average	Freight Conveyance		Passenger Conveyance		
		Electric Traction	Diesel Traction	Electric Traction	Diesel Traction	
Car-Hours	0.97	0.97	0.97	5.23	5.23	5.23
Locomotive-Hours	32.28	24.51	39.83	25.47	23.34	27.28
Shunting Locomotive-Hours	50.60	50.60	50.60	87.94	87.94	87.94
Locomotive-Kilometers at Head of Train and Traveling Alone	4.32	3.67	4.98	5.11	4.32	6.26



Using the rates of fixed capital and calculations performed to determine the values of the measures formulas were derived for the dependence of the capital-intensity of conveyance on qualitative indicators of the use of rolling stock. In addition, coefficients of the influence of qualitative indicators of the use of rolling stock for freight and passenger traffic by types of traction were calculated (see Table 7 below).

Table 7

Indicators of Use of Rolling Stock	Coefficients of Influence for	
	Electric Traction	Diesel Traction
	relative value of capital-intensity, changing in inverse proportion to the value of the particular indicator, %	
Dynamic Load of Loaded Car, tons/car	37.2	35.9
Gross Weight of Train, tons	24.7	31.8
Section Speed, km/hr:		
Freight Traffic	10.8	11.6
Passenger Traffic	10.4	11.7
Loading of Passenger Car, persons per car	46.4	50.3
Composition of Passenger Train, cars	30.8	37.5
	percentage of change in capital-intensity of conveyance with a one percent change in the given indicator	
Empty Runs by Cars Compared to Loaded Runs, %	0.17	0.17
Distance Traveled by Locomotives Alone Relative to Distance Traveled at Head of Trains, %	0.22	0.28

The proposed methodology makes it possible to use current report data to distribute the value of fixed production capital by types of conveyance and types of traction. To obtain more precise results it is necessary to study fixed capital inventory data. Using this data it is possible to determine the proportion of particular groups of capital depending on the volume of work, the value of track structures on main and station tracks, and the dependence of the value of production capital on the volume of work on sections with different types of traction by types of conveyance. This will make it possible to analyze the degree of use of railroad transportation capital more thoroughly and to use the indicators of utilization of capital and technical-economic calculations. It is advisable to work out a uniform methodology for distributing the value of fixed production capital by types of conveyance and types of traction, expanding the scope of current reporting on the use of this capital.

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CSO: 1829/240

USE OF ALUMINUM ALLOYS IN CONSTRUCTION OF RAILROAD CARS

Moscow ZHELEZNODOROZHNIY TRANSPORT in Russian No 11, 1981 pp 60-63

[Article by candidates of technical sciences Yu. A. Khapilov and L. V. Zhuravleva, and engineers T. A. Ratnikova and D. M. Matveyev: "Aluminum Alloys in the Supporting Structures of Railroad Freight Cars"]

[Text] The advisability of using aluminum alloys in the design elements of railroad freight cars is determined above all by the possibility of reducing their tare weight, and thus also reducing expenditures to move it and increasing the load capacity of the cars. Practical experience shows that the use of aluminum alloys in the design elements of freight cars makes it possible to reduce their weight by roughly 40-50 percent of the weight of the steel assemblies that are replaced. For example, when the bed of an eight-wheel grain hopper is manufactured from aluminum the tare weight of the car can be reduced by at least four tons. A through train composed of such cars will carry about 250-300 tons less tare weight and a correspondingly larger amount of useful freight. As a result energy expenditures for the same volume of shipping are lowered by about 9.5 percent.

Other important advantages of aluminum materials are their high corrosion resistance and the possibility of both manufacturing and repairing cars without applying protective lacquer-paint coatings on the surface. It should be noted that the possibilities of broad use of aluminum alloys in domestic railroad car building are growing steadily as the production of these materials increases.

The All-Union Scientific Research Institute of Railroad Transportation conducted several years of studies to evaluate the corrosion resistance of aluminum alloys under conditions that arise during the use of railroad rolling stock and to assess their resistance to contact-crevice corrosion and corrosion during abrasion and under the influence of power stress. The study investigated the corrosion-mechanical characteristics of aluminum alloys, including their fatigue and corrosion-fatigue strength. Based on the results of this work and also considering the recommendations and studies of other organizations and experience accumulated in foreign and domestic railroad car building, the aluminum alloys AMr3, AMr5, AMr6, and alloy 1915 were recommended for the supporting and other structures of railroad cars. The studies done at the All-Union Institute of Light Alloys also permit recommending alloy 1935. These alloys have a set of properties that meet the conditions of the work of railroad car design elements and the requirements of railroad building technology. The principal properties

are fairly high specific strength, stability of impact strength at low temperatures, heightened energy-intensiveness with impact loads (thanks to a modulus of elasticity lower than that of steel), high corrosion resistance, good weldability, and technological suitability for manufacture of semifinished parts and shaped pieces and parts made by the deformation technique.

Until quite recently aluminum alloys were used only to make the boilers of milk and acid tanks (technically pure aluminum) and for the internal facing and equipment of refrigerator cars. But the research that has been done and extensive experience over a number of years with the use of these alloys abroad demonstrated that they can be used most efficiently in the supporting structures of cars. In the early 1960's, for the purpose of accumulating experience, the Ural Railroad Car Building Plant (UVZ), on order from the Ministry of Railroads, built two 12-wheel gondola cars using aluminum alloys in the design of the body. Later, in 1973, the same plant manufactured an all-aluminum eight-wheel gondola car. The Altay Railroad Car Building Plant (AVZ) manufactured several experimental models of boxcars with bodies made of aluminum alloys.

Because aluminum alloys are considered to be a promising material for the supporting structures of freight cars, a summary of the results of the use of the experimental aluminum freight cars built in the USSR between 1961 and 1973 is interesting. Tables 1 and 2 below give the main characteristics of these cars.

Table 1

Manufacturing Plant	Type of Car	Year Built	Tare Weight %	Material of Body
UVZ	12-Wheel Gondola	1961	30	AMr6 alloy (steel frame)
	12-Wheel Gondola	1964	29.0	All-aluminum from AMr6 alloy (steel hatches)
	8-Wheel Gondola	1973	19.2	All-aluminum from AMr6 without paint (steel hatches)
AVZ	Boxcar	1964	19.5	AMr6 with partial use of alloy 1915
	Boxcar	1966	19.4	

As the tables show, alloy AMr6 was the main design material used for the cars. It has the following admixtures: 5.8-6.8 percent magnesium, 0.5-0.8 percent manganese, and 0.02-0.1 percent impurities. The mechanical properties of the alloy are characterized by the following indicators: ultimate strength of 32 kilogram-force per square millimeter, yield point of 16 kilogram-force per square millimeter, and relative elongation of 12 percent. All alloys of the aluminum-magnesium system have high corrosion and corrosion-mechanical resistance, and alloy AMr6 has the highest strength characteristics of them.

Table 2

Weight Characteristics of the Elements of the Bodies  
of Steel and All-Aluminum Gondola Cars  
12-Wheel 8-Wheel

Name of Assembly	Weight of Assembly, kg		Weight Reduction Achieved, %	Weight of Assembly, kg		Weight Reduction Achieved, %
	Steel	Aluminum		Steel	Aluminum	
	Side Walls	4,952	2,940	40.6	3,710	2,162
Frame	4,405	3,203	27.3	3,941	3,248	17.6
Face Doors	772	605	21.6	859	531	38.2
Total for Body (without hatches)	10,129	6,748	33.4	8,510	5,941	30.2

Inspections were made periodically by commissions over the space of 10-12 years to evaluate change in the technical condition of the experimental aluminum alloy cars during their use.

The 12-wheel all-aluminum gondola car built in 1964 was operated on an experimental route from the All-Union Scientific Research Institute of Railroad Car Building to UVZ. During the testing period from November 1965 to June 1967 the car traveled a total of 146,000 kilometers, which corresponds to the normal use of series-produced gondola cars in the railroad system. The periodic inspections showed the following problems with the cars: cracks in the diaphragm of the step bearing box along the weld, a crack in the welded seam connecting the lower horizontal sheet of the pivot beam of the frame with the cover plate of the center girder, a crack in the principal metal of the upper horizontal sheet of the pivot beam, and a crack in the welded seam at the connecting point of the upper horizontal sheet of the pivot beam and the reinforcing junction plate of the center girder.

After 3.5 years of use of this car breaks and dents in the upper horizontal sheets of the center and intermediate girder were found, which was related to incorrect use of bucket cranes during unloading. At this time the total distance traveled by the car was already 420,000 kilometers, which was 1.46 times the average distance traveled by series-produced cars during such a period.

Precisely the same defects were found in the 12-wheel aluminum gondola car with steel frame built in 1961. This damage was incurred after 8.5 years of use. During this time the car traveled a total of 723,000 kilometers, with an average daily run of about 241 kilometers.

The commission inspection conducted in 1976 obtained new data on the condition of both 12-wheel cars. Mechanical damage to the supporting structure was found during the inspection, including types of damage characteristic of steel gondola cars of the same type and caused by design flaws. These flaws were eliminated in later designs of steel gondola cars.

In the all-aluminum 12-axle gondola car damage was found in the form of fatigue cracks along welded seams (in some cases reaching the primary metal) at the connecting points of the center beam and the pivot beam. Both 12-wheel cars had this kind of cracks at the joints of the pivot, intermediate, and end posts with the transverse beams of the frame.

From the standpoint of corrosion resistance, the aluminum bodies of the cars were in good condition. Slight traces of surface corrosion were found only at points of contact between aluminum and steel parts. Only a very thin coating of corrosion products was observed on the surfaces of aluminum parts, whereas the steel frame of the experimental gondola car was significantly affected by corrosion.

The eight-wheel all-aluminum gondola car (see illustration [not reproduced]) built at UVZ in 1973 was examined in 1977 and 1980. The inspection revealed a crack at the reinforcement node of the intermediate post and the inner side between the connecting plank of the post and the transverse beam. It probably occurred when the car was unloaded by a car-tipper. A crack that carried over to the lower shelf of the Z-bar of the center beam occurred at the connecting node of the pivot beam and the center beam (at the point where the reinforcing plank abuts the lower sheet of the pivot beam). There were also cracks along the welded seams of the connection of the lower shelf of the Z-bar of the center beam and the vertical sheet of the pivot beam. A total of four of them were found on the car.

The defects found at the connecting node of the pivot beam and the center beam in the aluminum car indicate that this connection is not strong enough. According to data obtained by examining the technical condition of gondola cars in use in the railroad system, the damage rate for it in the steel design of gondola car is significantly lower.

It is important to note that the condition of the surfaces of the unpainted car is good from the standpoint of preserving corrosion resistance. Traces of corrosion (the presence of a thin layer of corrosion products without noticeable damage to the metal) were observed on the center beam at the connecting point with the vertical and lower sheets of the pivot beam. Contact-crevice corrosion occurs where parts made of different types of metals are arranged with small clearances between them. Traces of such corrosion were found on the pivot beam at the place where it abuts the edge of the steel hatch. Insignificant surface corrosion is observed on the vertical sheet of the transverse beam of the frame, caused by the action of aggressive substances being transported. But the general condition of the car is good and it provides evidence that freight cars made of aluminum alloys can be produced without paint.

The first experimental models of all-aluminum boxcars were built at AVZ in 1964, as already mentioned. The plant manufactured two experimental eight-wheel cars with tare weight of 19.5 tons and a body volume of 130 cubic meters. The length along the coupling axes and the base of the cars remain the same as they were for the series-produced boxcar. The cars were designed for clearance gauge 1-T.

To evaluate the operating indicators of the new cars as compared to series-produced cars they were put on an experimental route from the TsV [expansion unknown] to the Central Scientific Research Institute of the Ministry of Railroads.

Tests of the experimental cars were conducted by the All-Union Scientific Research Institute of Railroad Car Building and the Altay plant with participation by the car and freight administrations and the All-Union Scientific Research Institute of Railroad Transportation. But the cars were not operated for a long time. The roof of one car was damaged while passing a non-clearance (low overhead) point. The restriction on the allowable clearance of this car is related to an increase of 360 millimeters in the height of the body, which is registered for clearance 1-T. The other car was taken out of operation after one year of use because during the testing design defects were found which hindered loading-unloading work: jamming of the locking mechanism; destruction of the interior facing of the doors by the outside wall posts when the doors were moved, and so on. It was established that the defects were not directly related to the aluminum design of the car, but are simply the result of poor quality assembly.

The amplitude of vibrations for moving aluminum cars was observed to be much greater than for steel cars. The experimental cars did not have any corrosion damage.

In 1966 AVZ manufactured two more aluminum alloy boxcars in which the base was increased to 11 meters and the length along the coupling axes to 15.73 meters, while the height was reduced to fit within clearance 0-T. These cars have been in operations testing on an experimental route since 1967. After 249,000 kilometers of travel (nine years of operation), a crack 240 millimeters long formed in the vertical sheet of the pivot beam. It spread from the welded seam downward to the shelf of the Z-bar. Two transverse cracks 90 and 70 millimeters long appeared on the lower horizontal sheet of the pivot beam in the step bearing zone. They occurred after the total distance traveled was 335,000 kilometers, including 213,000 kilometers under load.

After nine years of using the car a crack formed in the welded seam at the connection point of the vertical sheet of the pivot beam with the center beam. It began from the upper horizontal sheet of the pivot beam and ran downward vertically along the welded seam. A second crack found after this period of use was recorded at the connecting point of the vertical sheet of the pivot beam with the lower horizontal sheet and shelf of the center beam. This crack was about 80 millimeters long. Cracks 25 and 40 millimeters long were also found at the points of the welded connections of the end beam of the frame with the center beam.

Thus, deterioration of the welded seams in the most heavily loaded elements of the welded designs of the frame begins in the ninth year of car use. But considering that the load capacity of the aluminum cars was not fully used during this time and that the average daily distance traveled for them was one-third of the figure for steel boxcars, we may assume that these defects could occur in aluminum cars after 4-5 years of normal use.

The results of observing the actual use of the first experimental freight cars and their principal assemblies made with aluminum alloys showed that they typically have the same kinds of damage found for the analogous steel assemblies. Generally these are cracks along the welded seams that in many cases spread to the primary metal of the sheet or rolled parts (including the pivot beam). It was established that these defects occur earlier than in steel structures and develop more intensively. This indicates aluminum supporting elements are not

acceptable in railroad cars for those structural forms which, on the basis of technological simplicity, are used in conventional steel cars.

The operation of the experimental aluminum cars confirmed the high corrosion resistance of this design material. From the findings of the inspections we may conclude that it is possible to use aluminum alloys in railroad car designs without painting. The only thing necessary is to take steps to prevent the occurrence of contact corrosion at points of contact between aluminum and steel parts. The most rational method of insulating points of contact is to metallize steel parts at the points of contact with aluminum parts.

Building experimental aluminum designs of freight cars for our railroads should be viewed as a beginning experiment which is unquestionably important and useful in view of the substantial advantages of the new materials. The question of using them widely to build lightened and corrosion-resistant design elements for freight cars should not be taken off the agenda. At the same time the efforts of researchers and designers should be directed above all to developing those types of cars in which both the qualities of aluminum alloys we have noted are important. Among such cars are refrigerator cars, grain hoppers, and other types of cars whose bodies have the form of a thin-sheet supporting shell. It can be very efficient to use aluminum alloys to make particular assemblies for cars which are intensively damaged by corrosion, for example the roof of boxcars.

During the development of designs for new aluminum cars and important parts and assemblies of them thorough consideration must be given to the properties of the alloys employed and their welded joints under conditions of the stresses that are typical for the assembly being developed. The greater technological suitability of aluminum alloys makes it possible to build more sophisticated and reliable connections between parts in the heavily loaded supporting assemblies of freight cars. The development of such connections should be done with due consideration for evaluating their impact and fatigue strength during the design process by conducting appropriate tests on models of these assemblies.

The new aluminum alloys 1915 and 1935 which have been incorporated by the metallurgical industry have excellent technological properties and are highly moldable. This makes it possible to obtain shaped parts of any configuration and dimensions and opens new opportunities for the use of aluminum alloys in railroad car building.

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## RAILROAD

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### PROGRESS REPORT ON NOVOSIBIRSK METRO CONSTRUCTION

Moscow TRANSPORTNOYE STROITEL'STVO in Russian No 1, 1982 pp 11-13

[Article by engineer Yu. Ye. Solomatin, Glavtonnel'metrostroy: "The Novosibirsk Metro Is Under Construction"]

[Text] Construction of the Novosibirsk Metro is going forward in conformity with the integrated plan for development of all forms of urban transportation.

The master plan of the subway system includes three lines, Lenin, Kirov, and Dzerzhinsk, with a total length of 52 kilometers and 37 stations (see Figure 1, next page).

The Lenin Line (19.4 kilometers long) and the Kirov Line (21.4 kilometers) connect the right-bank and left-bank parts of the city. The Dzerzhinsk Line, 10.4 kilometers long, will be entirely on the right bank of the Ob' River.

Construction on the first phase of the Novosibirsk Metro began in May 1979. The first phase is 12 kilometers long and includes the part of the Lenin Line from Ploshchad' Kalinina Station to Ploshchad' Marksa Station and the segment of the Kirov Line from Sibirskaya Station to Vokzal'naya Station, whose concurrent construction is contemplated to serve the Main Novosibirsk railroad terminal.

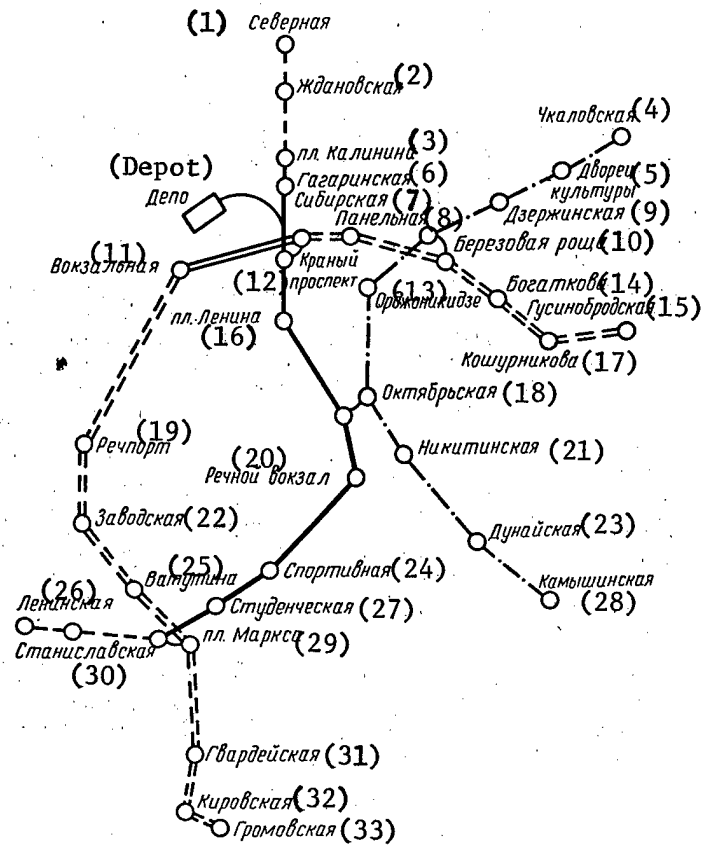
Metro trains will cross the Ob' on a bridge. The car depot will be built on alluvial ground in the valley of the Yel'tsovka River. The branch to the depot is 1.4 kilometers long. A single-track connecting branch to join the Lenin and Kirov lines is planned near Krasnyy Prospekt and Sibirskaya stations. The line administration and central traffic control workers will be located in the metro engineering building, which is under construction.

Launching of the first phase of the metro in Novosibirsk will provide reliable, fast transportation for the industrial and residential regions adjacent to the city's main road, Krasnyy Prospekt, with the center of the left-bank part of the city and the railroad terminal.

The Novosibirsk Metro is the first subway system in Siberia, and the project has encountered specific ground, climatic, and other construction conditions not encountered earlier in domestic experience.

Engineering-technical conditions and the city planning situation required that the first phase be constructed at a shallow depth throughout its length. The





(a) —○— Ленинская линия I очередь  
 (b) - - - Ленинская линия последующие очереди  
 (c) ······ Перспективная Дзержинская линия  
 (d) =○= Кировская линия I очередь  
 (e) - - - Кировская линия последующие очереди

Figure 1.

- |                                    |                         |
|------------------------------------|-------------------------|
| Key: (a) Lenin Line, First Phase;  | (15) Gusinobrodskaya;   |
| (b) Lenin Line, Subsequent Phases; | (16) Ploshchad' Lenina; |
| (c) Projected Dzerzhinsk Line;     | (17) Kozhurnikova;      |
| (d) Kirov Line, First Phase;       | (18) Oktyabr'skaya;     |
| (e) Kirov Line, Subsequent Phases. | (19) Rechport;          |
| (1) Severnaya;                     | (20) Rechnoy Vokzal;    |
| (2) Zhdanovskaya;                  | (21) Nikitinskaya;      |
| (3) Ploshchad' Kalinina;           | (22) Zavodskaya;        |
| (4) Chkalovskaya;                  | (23) Dunayskaya;        |
| (5) Dvoretz Kul'tury;              | (24) Sportivnaya;       |
| (6) Gagarsinskaya;                 | (25) Vatutina;          |
| (7) Sibirskaya;                    | (26) Leninskaya;        |
| (8) Panel'naya;                    | (27) Studencheskaya;    |
| (9) Dzerzhinskaya;                 | (28) Kamyshinskaya;     |
| (10) Berezovaya Roshcha;           | (29) Ploshchad' Marksa; |
| (11) Vokzal'naya;                  | (30) Stanislavskaya;    |
| (12) Krasnyy Prospekt;             | (31) Gvardeyskaya;      |
| (13) Ordzhonikidze;                | (32) Kirovskaya;        |
| (14) Bogatkova;                    | (33) Gromovskaya.       |

groundwater level is below the level of the underground structures of the subway at all points. Plans envision that the permanent lining and supporting structures of the stations and connecting tunnels will be built chiefly of factory-made reinforced concrete elements, as well as cast-in-situ concrete and reinforced concrete elements, using industrial methods.

The subway is being built by the collectives of tunnel detachment No 29.

The subway builders are now working on five stations. Four of them, Oktyabr'skaya, Vokzal'naya, Studencheskaya, and Sibirskaya are column-type structures with columns at intervals of 5.5 and 6 meters. The Ploshchad' Lenina Station will have a single-vault structure. The stations are being built by the open-cut method in pits with pile-type timbering.

All the stations are island-type stations and have platforms 100 meters long and 10 meters wide with two underground entry halls, with the exception of Rechnoy Vokzal Station which will have its entry hall on the surface.

The population of Novosibirsk is expected to reach 1.45 million in 1985 and 1.85 million by 1995. The number of passenger trips will reach 131 and 430 million a year in the same years. The maximum passenger flow in 1985 at the peak hour for the trip between Oktyabr'skaya Station in Ploshchad' Lenina Station is expected to be 29,800 passengers. It is contemplated that 40 pairs of four-car trains with I-class cars will be circulating at this time. In the first start-up section there will be 30 pairs of three-car trains at the peak hour. Shuttle train traffic is envisioned in the first period for the section of the Kirov Line between Vokzal'naya Station and Sibirskaya Station.

Most of the tunnels between stations are being built by the underground method using reinforced prefabricated concrete lining, some of it pressed into the rock. In the tunnel segments where the forcing method is contemplated cast iron tubing will be used for the lining.

Some of the tunnels between stations are being built by the open-cut method using whole-section lining (see Figures 2 [not produced] and 3, below).

The main tracks are designed using R65 rails with elastic rubber packing and spring-type fastenings on reinforced concrete support.

A reversible suction-and-exhaust ventilation system figured for 40 pairs of five-car trains has been adopted for the stations and tunnels. The principal system to insure train traffic safety will be an automatic speed regulation installation, with automatic blocking and automatic stops as a back-up system.

The power supply system for the subway is planned to use nine substations of the Novosibirsk Power System on a voltage of 10 kilovolts through nine underground and one surface traction substations.

The new KT-5, 6D2 tunnel-cutting complex manufactured by the Yasinovataya Machine Building Plant is undergoing production testing in construction of the tunnel between Oktyabr'skaya Station and Ploshchad' Lenina Station. This complex, which has an excavator or cutter-type working element, can construct subway tunnels in

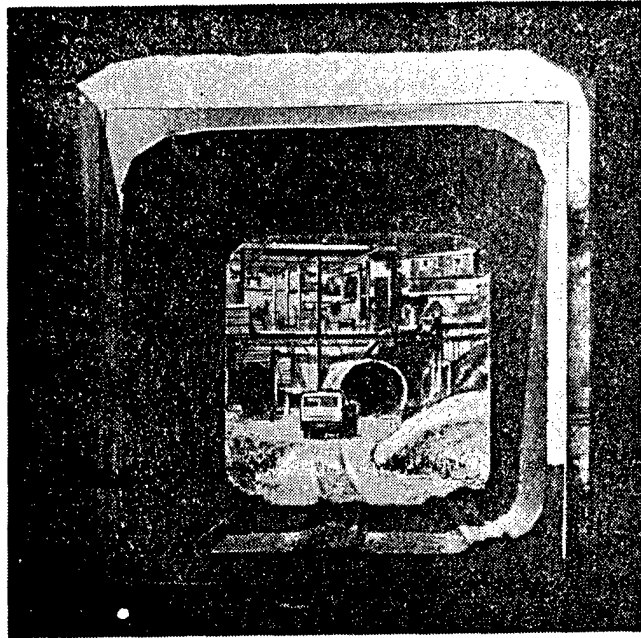


Figure 3

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sand, sandy loam, loam, clay, and rocky (types of limestone) ground with strength values up to 50 megapascal, as well as ground with rock interlayers not more than 20 centimeters thick with a strength value up to 60 megapascal and an abrasion value up to 15 milligrams.

Because the Novosibirsk Metro is being built in ground of Quaternary age composed chiefly of sandy loams and loess loams with solid or semisolid consistency, the tunnel-cutting complex has an excavator-type working element.

During its time of work in this section the complex has built more than 530 meters of tunnel. The technical productivity achieved by the complex is one meter per hour. The maximum rate of cutting for a shift was 3.1 meters, while for a day it was 8.5 meters. The corresponding average indicators are 1.5 meters per shift and 6.0 meters per day. In the entire period of operation of the complex the greatest monthly rate of cutting was 152 meters.

In order to carry on construction of the Novosibirsk Metro successfully, tunnel detachment No 29 is also building production support facilities, including a reinforced concrete structures plant, a machine repair plant, a motor vehicle pool, and a material-technical supply warehouse.

The Novosibirsk Metro is under construction. Its launching will permit a significant improvement in passenger transportation for the population and reduce the time spent by inhabitants and guests of Novosibirsk for travel around the city.

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PROBLEMS OF SHIP SERVICING, SUPPLY IN KALININGRAD DISCUSSED

Moscow VODNYI TRANSPORT in Russian 4 May 82 p 2

[Article by V. Uzel'man: "The Real Stumbling Block Is on the Dock"]

[Text] Everyone has had situations where his needs were beyond his capabilities. They even say that this contradiction conceals the engine of social progress. That is probably true, but only if the gap between essential needs and capabilities is not too large. If it is, people give up before long.

"The diesel ship Ivan Nesterov of the Lithuanian Steamship Company recently arrived in our Kaliningrad commercial seaport," said N. Smol'yanov, head of the Kaliningrad branch of the transportation fleet support service of the Baltic Steamship Company. "The crew turned in a request for repair of their radio navigation equipment. But we have a whole stack of these requests. Whether we like to or not, we have to set up a waiting line."

What is going on? As we see, this service does not have the necessary capabilities. To be more precise, it is not the service, but rather the port, to which the electrical navigation office belongs. Its regular staff is two specialists. Naturally, even if they want to they cannot service all these ships.

The Kaliningrad workers tried to solve the problem in the local area by concluding a contract with their neighbors at the maritime fishing port. But this cannot solve the problem. In the first place, the neighbors have plenty of concerns of their own, and in the second place it is difficult and expensive to deliver the bulky instruments to the fishing port in trucks. To put it simply, the employees of the transport fleet support service are in fact unable to reduce the gap between needs and capabilities.

"The Ivan Nesterov asked us to refill their fire extinguishers," Nikolay Vladimirovich continued. "We do this in the fishing port. But if they do not have the materials, there is no way the service can help. The seamen bring us requests for paint, paper, napkins, and dishes. We would be glad to give them to them, but where can we ourselves get them?"

The Kaliningrad branch of the transportation fleet support service of the Baltic Steamship Company only receives what Leningrad ships to them. As a rule this is only rags, brushes, and brooms. This kind of "supply" does not suit the seamen, of course. And it is not surprising that this has begun to influence the results

of the fleet's primary work. This same ship, the Ivan Nesterov, was able to save one month's time on a trip from Riga to Cuba and back to Kaliningrad. But then this entire savings was "eaten up" right in Kaliningrad. A good share of the time was lost waiting in vain for services rendered by the branch of the transportation fleet support service.

"So that is exactly our situation, we are always lacking things," N. Smol'yanov said. "The diesel ship Aleksandr Kollontay of the Latvian Steamship Company failed to head out to sea on time because of a delay in delivering linen."

The service branch turns linen in to the city bath-laundry combine for washing. The combine is also unable to carry out orders on time. It does not have sufficient capabilities. The plan of socioeconomic development of the port in the current five-year plan envisioned construction of a port-owned domestic services combine. But they decided to build a vegetable storage facility instead. It is probably necessary too. But the linen problem remains.

"If you want to carry the discussion of our problems through to the end," N. Smol'yanov continued, "you cannot fail to mention that the commercial seaport, which is supposed to fulfill the requests of the transportation fleet support service, also does not have adequate capabilities. For example, take the question of supplying ships with fresh water. How is it to be put on board?"

The port has just one water boat with a capacity of 500 tons. Only one dock is outfitted with pumps, and they do not work because the water pressure is too low. Reconstruction of the docks has now been planned. Pumps will be installed on all docks. It is not clear, however, what will happen with water pressure in the lines. And in the meantime, since you cannot go anywhere without water, ships take on water in other ports, most frequently foreign ports. This costs foreign exchange!

In Kaliningrad it is difficult not only to get water, but also to get rid of it if necessary. The diesel ship Balkhash of the Northern Maritime Steamship Company, for example, submitted a request to dump a quantity of polluted water. Unloading of the ship was completed, but their request about the water was not carried out. The ship was tied up to dock No 39. The Balkhash simply stood there, besieged by radiograms from its company office: "The ship is unloaded, so why are you waiting?" The polluted water was not removed from the ship for three days. And in fact, the port has just one vessel for this purpose.

The "Integrated Plan of Measures To Improve Fleet Service in the Kaliningrad Commercial Seaport" was developed long ago. But it is being carried out somewhat one-sidedly. The proper proportion has not been observed in distribution of capital to primary (cargo-handling) and service operations. Last year various steps were taken to speed up fleet processing in this port, for example putting new cranes into operation, outfitting two decks for grain unloading, and so on. At the same time the port for the umpteenth time asked the Baltic Steamship Company in vain for a bunker ship, a tugboat, a launch, and a water boat.

"After all our fruitless efforts people are giving up," Nikolay Vladimirovich Smol'yanov sighed at the end of our conversation. "I feel upset that we fulfill just 10 percent of the seamen's requests at best."

Certainly, it is hard to work without moral satisfaction. It is even harder to admit that you are powerless. If only the matter could be handled by the chief of the branch alone.

The port of Kaliningrad does not freeze over. Thus, we can understand its importance, and not just for its own steamship company. In the winter a kind of "tidal wave" develops here; that is how many ships come here from various basins for processing. This happens year after year, which means that preparations could be made in advance. But it appears that the Baltic Steamship Company is not too concerned about this.

So it turns out that the seamen, toughened by ocean crossings, are more frightened by the "tidal wave" in port than by storms at sea. Here in Kaliningrad they are powerless to do anything, just as the branch of the transportation fleet support service is powerless to help them. It does not have the capability. Its capabilities are far less than the needs of the fleet.

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## OCEAN AND RIVER

### RECENT PERFORMANCE, UPCOMING CHALLENGES OF MARITIME TRANSPORTATION SECTOR

Moscow MORSKOY FLOT in Russian No 4, Apr 82 pp 2-6

[Article by V. Tikhonov, first deputy minister of the maritime fleet: "The Maritime Fleet: Results and Challenges"]

[Text] The birthday of the great Lenin, founder of the Communist Party and Soviet State, has always been a major holiday for the Soviet people, a time to summarize what has been done and a starting point for further achievements.

And so it is today, on the 112th anniversary of the birth of V. I. Lenin; the results of fulfillment of plans and assignments for the first quarter of 1982 are being summarized and work in 1981 is undergoing thorough analysis. The final results achieved in the 1970's are being reviewed on the basis of final statistics and other data in order to lay a strong bridge into the 1980's to successfully meet the challenges posed by the 26th CPSU Congress.

Maritime transportation is growing from five-year plan to five-year plan, increasingly meeting the country's needs for conveyance of cargo and passengers. The 1970's were especially intensive in this respect. The fleet received new, highly productive ships with different cargo capacities and technical specifications and shore facilities, above all seaports, were developed intensively.

If we compare the first year of the Ninth Five-Year Plan, 1971, and the first year of the 11th Five-Year Plan, that is 1981, the value of fixed productive capital in the later year had increased by 225.5 percent, cargo turnover in all types of shipping was up 21.7 percent, and shipment of cargo had risen more than 30 percent, including almost 50 percent for overseas shipping. Shipment of export-import cargo by sea and export of transportation services taken as a whole grew almost 2.5 times. There was significant progress in performance of loading-unloading operations in port: the volume of such work rose by more than 49.5 percent during these years. Cargo shipment in stacks quadrupled, while container shipping increased 6.6 times.

Significant capital was invested in housing construction and modernization of the working and living conditions of seamen, port workers, ship repair workers, and other employees of maritime transportation. For example, in these 10 years 3.3 million square meters of housing was built.

The collective of the sector completed the first year of the 11th Five-Year Plan in fine fashion. To do so they had to work hard in the fourth quarter. The



Growth in Cargo Turnover. The cargo turnover of maritime transportation of all types reached 456 billion ton-miles in 1981.



Growth in Loading-Unloading Work (1981 as percentage of 1971).

shipping plan for coastwise shipping was 102.2 percent fulfilled for the ministry as a whole, while for overseas shipping it was 102.7 percent fulfilled.

The Murmansk and Caspian steamship companies did not meet their fourth quarter plans for coastwise cargo shipment, but above-plan reserves accumulated in the first nine months and enabled them not only to complete the year's plan, but to exceed it. All the other steamship companies made significant contributions to overfulfillment of the annual plan. Among the leaders in competition were the Baltic and Black Sea companies.

Despite the difficult navigation season last year the steamship companies of the Far East worked more consistently than in 1980. They carried several hundred thousand tons of cargo above the plan. This result was due above all to the successful work of the Far Eastern Steamship Company. Nonetheless, it must be noted that some cargo did not reach Magadan at the right time, and this should not be repeated in 1982.

A significant amount of equipment was delivered to gas and petroleum extraction industry enterprises under construction and to prospecting geologists in the Yamal region, and year-round navigation to Dudinka in order to transport cargo to the Noril'sk Mining-Metallurgical Combine was accomplished.

The 1981 plan for coastwise shipping was fulfilled by 106.8 percent for the sector as a whole, while the overseas shipping plan was fulfilled by 103 percent as the result of measures taken by the steamship companies, crews of ships, and employees of ports, ship repair yards, administrations, and divisions of the ministry. These indicators are higher than those adopted in the supplementary socialist obligations for 1981. Continued growth in container and stack shipping was achieved, but in this area there are still many shortcomings and unresolved problems.





Concern for Seamen. In the period 1971-1981 the following were built: 3,324,400 square meters of housing; children's and preschool institutions for 12,310 children; hospitals with 1,085 beds; polyclinics for 2,750 visits; recreation centers with 1,170 places; dining halls with 12,510 places.

The Fleet — the Main Element of Maritime Transportation. Growth in Maritime Tonnage (1981 as percentage of 1971).

Ships of the transport and passenger fleet carried 54.4 million passengers in 1982, 2.7 million more than in 1980. As in earlier years the steamship companies of the Black Sea-Azov basin were the leaders.

In the first quarter of 1982 the maritime fleet performed a large volume of both coastwise and overseas shipping. The Caspian and Sakhalin ferry crossings worked without interruption, as did the international crossing from Il'ichevsk to Varna. The seagoing ferry Sakhalin-6 made its way through gales and ice into Nagayevo Bay to the docks of the port of Magadan in February 1982, delivering a transformer from the port of Vanino for the Kolymenskaya GES. Together with its railroad flatcar the transformer weighed hundreds of tons.

The seaports continued to work intensively. In 1982 they must transship a large quantity of food and industrial cargo in addition to pipe and equipment for key construction projects.

Maritime transportation is taking an active part in development of USSR foreign trade with the other CEMA countries on the basis of consistent development of production specialization and cooperation. This is the high road to putting scientific-technical advances into use and raising production efficiency and the quality of output in the interests of steady growth in public well-being.

In January 1982 at the 102nd session of the CEMA Executive Committee the results of work to conclude long-term trade agreements among CEMA countries and Yugoslavia for the current five-year plan were summarized. Mutual trade among these countries will increase by 38 percent in 1985 over 1980 (in comparable prices). Mutual deliveries of specialized output will increase even faster,



Our Goal Is Profitability. Growth in the Profit of Maritime Transportation Enterprises and Organizations (1981 as percentage of 1971).



The Ship Repair Industry. Growth in the Output of Ship Repair Enterprises (1981 as percentages of 1971).

48 percent during the five years. The growth in mutual commodity exchange will promote further planned development of the economies of the CEMA countries and satisfaction of the needs of their populations.

The collectives of the Soviet Danube, Black Sea, Azov, Baltic, Estonian, Latvian, Novorossiysk, Far Eastern, and other steamship companies must in their plans and obligations give fuller consideration to prompt, uninterrupted delivery of cargo according to contracts between the Soviet Union and the other CEMA countries and insure that they are carried out.

Thanks to an improvement in the planning of shipping to Cuba and extensive development of international socialist competition among the crews of Soviet ships and Cuban dock workers it was possible to reduce ship downtime in port significantly. But ships still spend a long time in port waiting for processing and undergoing cargo-handling operations.



Maritime Shipping, All Types. 1981 as Percentage of 1971: All Cargo — 134%; Including Liquid Cargo — 138% and Dry Cargo — 123%.



Across the Seas and Oceans. Fleet Work in Overseas Shipping. 1981 as Percentage of 1971



Containerization — Progress in the Transportation Process. The volume of container maritime shipping increased 6.5 times between 1971 and 1981; the volume of stacked maritime shipping increased 4.1 times in this period.

The Baltic Steamship Company accounts for the largest share of shipping to Cuba (up to 70 percent of all machinery and equipment). Until recently this led to the accumulation of a large amount of cargo both in the Leningrad port area and in railroad cars waiting to be unloaded. The Baltic workers found an interesting form of cooperation with their principal clients. They concluded contracts with the Volga Automotive Plant and the Kama Truck Plant to insure even, regular shipment of vehicles to the port of Leningrad for export of Cuba.

Working on the basis of direct contracts with the principal clients of maritime transportation will help greatly to put the workloads of ports in order, improve preservation of cargo, and increase shipping in containers and stacks. The experience of the Baltic Steamship Company should be used, above all in the Black Sea-Azov basin and the Far East.

A large volume of shipping was done by the maritime fleet in 1981 on the basis of foreign trade contracts with many developing and industrially developed countries. Further growth in foreign trade turnover is planned for 1982, and this is an important factor in easing tensions in the struggle for world peace.

Maritime transportation workers completely and wholly support the Leninist peace-loving policy of the CPSU Central Committee and the Soviet Government. We are people of peaceful professions. The ships of the Soviet commercial fleet visited about 1,300 ports in more than 125 countries in 1981. They were carrying ore, petroleum, machinery and equipment, timber, chemicals, building materials, food, and industrial consumer goods.

The socialist states occupy the principal place in the Soviet Union's foreign economic ties. They account for more than one-half of USSR foreign trade turnover.

Commodity turnover with the Western European partners also developed intensively in the 1970's. It reached 31.6 billion rubles in 1980 compared to 4.7 billion in 1970. At the present time 80 percent of all USSR trade with the industrially developed capitalist countries goes to Western European countries, and the Soviet Union's leading trade partner among them is West Germany. Continued cooperation will become even closer with construction of the transcontinental export gas pipeline from Western Siberia to the western border of the Soviet Union, a length of more than 4,000 kilometers.

To do this the Soviet maritime fleet will have to ship a significant amount of pipe, equipment, and other cargo from the ports of the Western European countries, and dock workers and machine operators will have to send this cargo to the gas pipeline construction regions without delay. Such an important, national project must be constantly monitored by the Ministry of the Maritime Fleet. It must be a focus of attention for all maritime transportation workers. The gas pipeline contract represents the greatest initiative in our day to solve energy problems on a European scale.

Comrade L. I. Brezhnev, speaking on the occasion of receiving the Golden Mercury international prize said: "We in the Soviet Union have always viewed free and even international trade not only as a good means of satisfying the material interests of the participating parties, but above all as a powerful factor for strengthening peace and good relations among peoples."

Maritime transportation workers, who are in the forefront of our country's international trade, are doing everything they can to fulfill their obligations for shipment of foreign trade cargo completely, well, and on time.

The party and government show constant concern for improving the well-being of the Soviet people. The CPSU Central Committee and USSR Council of Ministers, guided by the decisions of the 26th CPSU Congress and considering the great importance of Soviet trade for a steady rise in public well-being, recently adopted the decree "Steps Toward Further Development of Trade and Improvement of Trade Service to the Population in the 11th Five-Year Plan." Transportation, including the maritime sector, plays an important part in carrying out all these measures. All the steamships companies must insure prompt and full delivery of industrial and food goods to points in the Arctic and other remote regions of the country which have

limited navigation seasons. This also applies to shipping cargo to Magadan, Sakhalin, and Kamchatka, where the maritime fleet is the only stable transportation link. The ferries of the Caspian maritime railroad crossing carry many thousands of tons of national economic cargo between the republics of Transcaucasia and Central Asia.

The party and government are showing great concern for providing the public with a diversity of goods. A broad assortment of food and industrial goods is purchased abroad, and most of these goods are delivered by sea. The duty of maritime fleet workers to meet the challenges of further development of trade and improving trade service to the population is to do a good job of moving all cargo delivered out of seaports and send it immediately to the consumers.

There cannot and must not be any passive observers here: every seaman, port worker, and person of any occupation related to maritime transportation must be involved in solving these national problems.

The party is leading the peoples of the USSR along the road of friendship and brotherhood, following a policy of building the material and cultural potential of each republic and making maximum use of it for balanced development of the entire country. Celebration of the significant anniversaries of the Soviet republics and greeting the 60th anniversary of the formation of the USSR, which will occur in December 1982, in a worthy fashion are evidence of loyalty to this Leninist policy, which is thoroughly substantiated in the decisions of the 26th CPSU Congress, and a triumph of our mighty international alliance.

The republics of our country which have outlets to the sea have formed and are successfully operating maritime steamship companies. Their work volumes differ. They are established on the basis of geographic, economic, and other specific factors. The proportions of the steamship companies in all transportation activity are determined accordingly, but one key principle is invariable: by rational distribution of labor among them we insure an uninterrupted transportation process in the interests of the national economy and economic and social development of the sector from a national point of view.

The table below gives figures on the work of the steamship companies of particular republics based on 1981 results.

The collectives of all the steamship companies, preparing to greet the national holiday of the 60th anniversary of the formation of the USSR in a worthy fashion, adopted stepped-up socialist obligations for 1982 and are making every effort to meet them.

The first among equals in our vast native land is the RSFSR. Its steamship companies have the principal role in transportation support for the Northern Sea Route. Successfully meeting this challenge is enormously important for the national economy, not only in the immediate future but in the longer run.

The Arctic zone, which includes the shelf of the Arctic Ocean, occupies 40 percent of USSR territory, stretching across the entire country from west to east. A significant share of the natural resources of the USSR is concentrated in this zone. This applies, in particular, to the polymetallic ores of Noril'sk, the tin deposits of Yakutia, and the deposits of Yamal gas and petroleum.

Table

Steamship Companies, by Republics	Steamship Companies	Ports	Coastwise Shipping %	Overseas Shipping %	Loading-Unloading Work in Ports	Load Capacity of Ships %
RSFSR	8	38	36.3	49.4	41.3	60.8
Ukraine	3	19	18.5	31.7	38.8	23.8
Estonia	1	1	2.2	2.5	2.4	1.6
Latvia	1	2	1.0	8.9	4.5	6.2
Lithuania	1	1	-	2.4	3.0	1.2
Georgia	1	3	2.0	4.7	3.3	4.5
Caspian Steamship Company	1	5	40.0	0.4	6.1*	1.9
Total	16	69	100.0	100.0	100.0	100.0

\* The ports of the Central Asian Steamship Company account for 0.6 percent.

Everyone knows the statement by Mikhail Vasil'yevich Lomonosov: "Russian might well be enhanced by Siberia and the Arctic Ocean." There have been many heroic chapters in the history of development of the Arctic basin. For centuries Arctic pioneers pushed forward in this harsh region, literally mile by mile, to win the transportation route without which there simply could be no development of the natural wealth of the Arctic basin.

Year-round navigation to the port of Dudinka is already a reality today. Delivery of cargo in the winter with unloading onto the pack ice is an important new accomplishment. This transportation scheme made it possible to provide fairly reliable supplies to geologists and construction workers who are developing the natural wealth of the Yamal peninsula and other Far Northern regions. Regular shipping of timber from the port of Igarka is very important for Soviet timber export.

In conformity with the decisions of the 26th CPSU Congress, the State Plan of Economic and Social Development of the USSR for 1981-1985 contemplates an increase in the role of maritime transportation in service to the Arctic region. Shipping in these regions is to increase roughly 40 percent during the five years.

The first ice breaker-class lighter-container carrier with a nuclear power plant for work in the Arctic basin will be built in the 11th Five-Year Plan. Introduction of the lighter-carrier system will allow a significant improvement in preservation of cargo en route when it is delivered to regions of the Far East and north, especially to large populated points and for geological and other expeditions. When large specialized ships with powerful engines begin regular sailing under ice-breaker escort in the Central Arctic in the near future, the distance between Murmansk and the Bering Strait will be cut by one-third over traditional distances of the Northern Sea Route.

The steamship companies of the Russian Federation account for roughly half of overseas shipping. The Ukraine is represented by three steamship companies, the Black Sea, Azov, and Soviet Danube companies. The Black Sea Company is the largest in the country and, together with the Baltic, Far Eastern, and Novorossiysk companies, has a fleet with unlimited sailing range.

The Caspian Steamship Company, located in Baku, transports cargo in the Caspian basin within Azerbaijan, Turkmenistan, and the RSFSR and accounts for 40 percent of all coastwise shipping done in vessels of the transportation fleet. The Central Asian Steamship Company serves four republics.

The steamship companies of all the republics have clearly defined tasks and close cooperation among them guarantees success in performing these tasks.

Well-organized socialist competition is an important factor in insuring successful fulfillment of plans and assignments.

Throughout 1981 the collectives of the Baltic and Black Sea steamship companies awarded a Challenge Red Banner of the Ministry of the Maritime Fleet and Central Committee of the Trade Union of Maritime and River Fleet workers and monetary prizes based on quarterly work results, but in the two-sided socialist competition the Baltic workers were generally victorious. To achieve victory the Black Sea Steamship Company must not only struggle to fulfill its plans, but also devote greater attention to safe sailing and to putting production facilities under construction into operation.

Based on work results for 1981 challenge red banners of the CPSU Central Committee, USSR Council of Ministers, AUCCTU, and Komsomol Central Committee were awarded to the Estonian Steamship Company, the port of Leningrad, and the Slavyansk Ship Repair Yard, and their names were entered on the All-Union Board of Honor at the Exhibition of the Achievements of the National Economy. The collective of the Port of Odessa was also awarded a challenge red banner.

Attempting to equal the leaders and studying and disseminating their know-how are important reserves for improving efficient use of transportation resources.

Port workers face new, more difficult challenges in 1982: speed up the processing of ships and railroad cars, and insure prompt dispatching of food, industrial consumer goods, pipe, equipment, and other cargo for important construction projects in the country. These matters should be resolved in close cooperation with the collectives of related forms of transportation, working on the basis of a unified, continuous plan. Socialist competition must be developed by every means within the framework of transportation centers and also among them.

Special attention must be devoted to; disseminating and refining by every means the work practices of the Leningrad transportation center, which have been approved by the CPSU Central Committee; optimization of the transportation process; instituting the strictest economies in use of all types of resources; raising labor productivity; and, fulfilling the comprehensive plan for economic and social development of enterprises. Everything that hinders participants in competition from achieving optimal results with minimal expenditures must be resolutely overcome.

Councils of innovators, bureaus of economic analysis, schools of communist labor, and other public agencies are expected to play a significant part in the attainment of planned goals by maritime transportation workers. No useful initiative should go without attention and support.

Studying and disseminating the work experience of the collectives who were winners in all-Union Socialist competition and the initiatives of production leaders and innovators and insuring a fast pace, precise rhythm, and high quality in work will make it possible to meet the challenges given to the sector in the year of the 60th anniversary of the formation of the USSR, the year of the trade union congress and the Leninist Komsomol Congress.

"Organization, a business-like attitude, and discipline — these are essential requirements in the central administration and in the local areas," Comrade L. I. Brezhnev observed in his speech at the November 1981 Plenum of the CPSU Central Committee. "The activity of all party, state, and economic bodies must be structured from precisely this point of view."

Switching our economy to a primarily intensive footing now demands greater accountability from planning agencies and engineering-technical personnel, as well as greater precision and substantiation of all management decisions. To manage efficiently means to manage in an organized manner, without dispersing efforts. Organization is also a demand made by scientific-technical progress. It is not enough to have the latest equipment, modern ships, and new cargo-handling complexes and to work out the most sophisticated procedures. We must see that these procedures are followed absolutely. We must constantly improve labor sophistication, organize labor in a scientific manner, conserve machinery, raw materials, and energy, and put an immediate stop to mismanagement and waste.

The documents of the November 1981 Plenum of the CPSU Central Committee and the new five-year plan confirm the line of the 26th party congress which aims at implementation of a broad social program covering various aspects of human life: housing, working conditions, and everyday living conditions. The food problem is at the center of attention. In an economic and a political sense it is the key problem of the entire five-year plan. The way to solve these problems as quickly as possible is to increase production by every means and raise labor productivity, which depends on the attitude that each of us has toward our work.

A crucial condition for improving work is strengthening labor and state discipline. This demand touches everyone regardless of the position a person may hold. The 11th Five-Year Plan has become the law of our life. Therefore, we must consider it as a law, as a crucial state document. To instill respect for the plan means to prevent unsound adjustments downward, to demand unconditional fulfillment of plan assignments, and to make every individual more accountable.

The greater the scale of the challenges we face in the economic sphere, the more important good, conscientious labor becomes and the more important it is to use the potential existing in every element of the economy more fully.

The challenge today is to fulfill and overfulfill the 1982 plan and the five-year plan as a whole and achieve a significant rise in labor productivity. Meeting this challenge depends greatly on the level of consciousness of the people, on their discipline and sophistication at work, in public life, and at home. This



means that we must consistently work to strengthen the material and nonmaterial foundations of the socialist way of life and make fuller use of the initiative and activism of all working people.

If all subdivisions of the sector fulfill their 1982 plans and socialist obligations adopted in honor of the 60th anniversary of the USSR with due regard for results achieved in 1981, this will lay a reliable foundation for successful completion of the plan for development of the maritime fleet in the 11th Five-Year Plan. There is no question that the collective of maritime transportation, many thousands strong, will do everything depending on it to meet these challenges with honor.

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## OCEAN AND RIVER

### IMPROVING CARGO TRANSSHIPMENT AT SEAPORTS REVIEWED

Moscow VODNYI TRANSPORT in Russian 18 May 82 p 2

[Article by B. Trunov, deputy minister of the maritime fleet; "Transship Cargo Quickly"]

[Text] Improving the use of the production capacities of the ports and the technical potential of each dock and loading area is becoming crucial today for more fully meeting national economic shipping needs and raising the work efficiency of maritime transportation. A great deal has been done in this direction in recent years. Cargo turnover at the ports increased significantly in 1981, and 31 percent more goods were shipped to the national economy than in 1980.

The technical equipment available at seaports is increasing year after year. Specialized complexes to transship cargo are being set up to increase carrying capacity. The volume of commodity shipping in specialized ships is growing, and more progressive standard technological procedures and equipment for stacking packaged cargo, timber, and metal are being introduced. The specialization of ports by types of cargo and routes has been revised and the ports of Murmansk and Arkhangel'sk, as well as shallow southern harbors, have been added to the list of ports handling important foreign trade cargoes. The transshipment of foreign trade cargo at Vladivostok and Nakhodka has increased.

The supplementary benefits established for dock machine operators and other employees in 1981 by decree of the CPSU Central Committee and USSR Council of Ministers are an important stimulus to raising the efficiency of work of the ports.

Where the production capacities of the ports have grown significantly, their efficient use is increasingly directly dependent on the carrying capacities of related forms of transportation and coordination of their work. Therefore, along with increasing technical equipment available at related enterprises it is becoming more and more important to organize their work according to continuous schedule-plans. This makes it possible to coordinate the activity of different forms of transportation on the basis of scientifically substantiated norms. In actuality it is the highest form of management of the transportation process and, as observed by Comrade L. I. Brezhnev in his greeting to the collective of the Baltic Steamship Company, it makes it possible to raise the efficiency of use of ships, railroad cars, and motor vehicles without additional capital investment.

In 1981 the Leningrad transportation center increased the volume of cargo transshipment by 18.8 percent over 1980, and 74.7 percent over 1977, before introduction

of the NPGRTU [Continuous Schedule-Plan for the Work of a Transportation Center]. Cargo transshipment by the direct alternative increased by 36 percent over 1980 and 3.9 times over 1977. Shipment of imported cargo by river and motor vehicle transportation increased by 91.3 and 48 percent respectively in 1981 over 1980. This made it possible to free more than 7,500 railroad cars. In addition, another 10,000 cars were freed by increasing the static load. Labor productivity in the port rose 16.6 percent and the prime cost of transshipping cargo declined.

The port of Leningrad is consistently handling all railroad cars presented for loading and unloading. It does not allow them to accumulate and stand idle for periods beyond the norms. This is the result of purposeful work by the coordinating council of the Leningrad transportation center, which achieves effective monitoring of performance of the NPGRTU on the basis of strict fulfillment of normative-methodological documents for mutually coordinated planning.

One of the ways to raise the working efficiency of transportation centers, as experience demonstrates, is to expand direct links with cargo shippers and receivers. The Leningrad seaport and the Volga Automotive Plant concluded a contract for cooperation. It has resulted in more operational regulation of shipping in and out, stepped-up delivery of goods to their destinations, and a reduction in processing time for means of transportation. The port of Leningrad and the Baltic Steamship Company are now successfully expanding methods of cooperation with the Volga Automotive Plant and the Kama Truck Plant, which have been tested by experience, to other suppliers of export cargo.

At the initiative of the seaport collective, the transportation workers of the Odessa Center, together with Dnepr river workers, the Cherkassy automotive plant workers, and the chemical workers of the Azot Production Association, are setting up an industrial-transportation complex based on an optimal plan for exporting carbamide with an eye to the possibility of switching as much cargo as possible from rail to river and motor vehicle transportation. The enterprises of the Klaypeda transportation center and the coal enterprises of Vorkuta have achieved good results with cooperation on the basis of direct links.

More efficient work by transportation centers is promoted by introduction of sets of ASU [Automated Control System] problems that support operation of NPGRP [Continuous Schedule-Plans for Port Work] and NPGRTU's and shared use of the computing centers of the seaports, steamship companies, and railroads to improve mutual information on the movement and processing of ships and railroad cars.

The potential of continuous, mutually coordinated planning is used most efficiently by the enterprises of the transportation centers of Novorossiysk, Il'ichevsk, Batumi, and certain others. They generally fulfill established plans for shipping the most important cargoes, have organized good mutual information, and have active coordinating councils.

Analysis of the work of the transportation centers shows that the greatest success is achieved where this work is headed by the chiefs of the steamship companies, railroads, and motor vehicle transportation enterprises. And on the other hand, where the managers of the steamship companies do not give the necessary attention to the work of the coordinating councils efficient, mutually coordinated continuous planning does not occur. This can be seen from the

results of the work of transportation centers in the Far East. They systematically fail to fulfill plans for shipping important cargo and permit railroad cars to accumulate beyond norms. The port of Vladivostok does not unload railroad cars carrying export and transshipment cargo promptly. The managers of the Northern, Soviet Danube, and Azov steamship companies also fail to give adequate attention to the work of the transportation centers.

Guaranteeing shipment of poured, general, refrigerated, and other types of cargo by designation is a paramount challenge today. Solving this problem is directly dependent on the degree of cooperation with other forms of transportation. This refers above all to railroad transportation, because 97 percent of all goods are shipped from seaports by rail. Therefore, improving the uniform technological procedures of the work of ports and railroad stations and unifying agreements in the transportation centers are very important today. The chiefs of the steamship companies and ports, together with the coordinating councils of the transportation centers, must give greater attention to identifying and eliminating "bottlenecks" and taking steps for balanced development of the carrying capacities of all elements of the transportation centers. Work to eliminate disproportions in the development of the ports and railroad stations should be actively guided and coordinated by the GKHO's [State Economic Associations] and the Ministry of the Maritime Fleet's administration of development and capital construction and administration of fleet operations, together with the appropriate subdivisions of other transportation ministries. This work must be done on the basis of precise calculations.

Enterprises of river and motor vehicle transportation could do much more to insure that cargo is moved out of seaports directly to the points of consumption. Work is being done in this direction, but there are still reserves. The challenge now is to switch as much shipping as possible from rail to river and motor vehicle transportation. The managers of the GKHO's, steamship companies, and ports and the coordinating councils of the transportation centers must give this problem greater attention.

One of the principal ways to increase the volume of cargo transshipment is to improve the quality of operational planning and regulation of fulfillment of plans and assignments. Therefore, all the operational subdivisions of the ministry, GKHO's, steamship companies, and ports must organize their work to insure optimal use of every port and every dock. The organizational role of the plan for shipping import cargo out of seaports by rail increases greatly here. This is the key document on whose basis all the work of the fleet and the ports must be structured. All the organizational and party political work in ports and steamship companies should be aimed at fulfilling this plan. Unfortunately, we still have not been able to make the managers at all levels in the GKHO's, steamship companies, and ports consider this plan the key directive document.

Thus, in just the first 20 days of April the ports of the Yuzhflot GKHO requested 700 railroad cars less than the assignment for refrigerated cargo, 677 less for packaged goods, and 200 fewer than the assignment for poured cargo. The ports of this association failed to put a significant number of cars into use. The ports of Berdyansk, Kerch', and Reni have the greatest problems in this respect.

The ports of Sevzapflot and Dal'flot also failed to put all cars into use. Because of delay in the arrival of ships carrying sugar to Murmansk and flour to

Arkhangel'sk, these ports also requested fewer railroad cars than required for the assignment.

I would like to emphasize that we cannot expect the railroads to deliver the planned numbers of cars for loading if rolling stock arriving at the ports carrying export and transshipment cargo is not promptly unloaded. Nonetheless, the ports of Odessa, Reni, Vladivostok, and Vanino are not unloading cars on the planned scale. There are a number of objective reasons for this, but the major impact on the accumulation of rolling stock carrying export and transshipment cargoes is also a result of the disproportion between the arrival of goods in the ports and their shipping out by sea. This applies above all to the Black Sea and Far Eastern steamship companies.

At the same time we should emphasize that the problem of full-scale use of the ports of Murmansk, Arkhangel'sk, Nikolayev, Vladivostok, and Nakhodka for transshipment of foreign trade cargo still has not been resolved. The reserve carrying capacities of the ports of Zhdanov, Kerch', Poti, and a number of others are not being adequately used. The challenge is to see that every dock is used in full conformity with its technical carrying capacity.

We must strive today to see that all ports contribute to accelerating the delivery of cargo to the national economy in strict conformity with production resources allocated to them by the ministry. The net intensity of transshipment of poured cargo remained about the same in 1981 in the ports of Novorossiysk, Klaypeda, Leningrad, Riga, Odessa, Kaliningrad, and Il'ichevsk. But in Ventspils it was 43.5 percent lower than in the above-mentioned ports, while in Zhdanov it was 42.6 percent lower and in Reni 72.1 percent lower. This means that these collectives have substantial unused reserves.

Optimal concentration of resources on every ship presented for processing is an important factor in reducing fleet downtime in port. Unfortunately, not all ports and steamship companies are precisely following the existing statute on organization of handling the dry-cargo fleet by optimal procedures. Additional reserves are concealed here too.

Work must be continued to summarize and disseminate the progressive practices of consolidated comprehensive brigades and advanced progressive technology.

We must emphasize once again that raising the efficiency of port work demands a radical improvement in management of their work both by the ministry and GKHO's on the one hand and the steamship companies on the other. The system and structure of management, including the operational control, planning, and monitoring system, must be refined at all levels. There must be improvement in the technology of cargo transshipment, in commercial and financial planning activity, in the organization of labor and wages, and in personnel work. The normative base must be further refined, and development work on setting up ASU's must be accelerated and improved.

The enterprises must make new efforts to reinforce and develop everything positive achieved in the ports in recent years. We must not forget further strengthening and development of their material-technical base either. And of course, we should make broad use of the experience of the leading collectives of

dock machine operators headed by Ye. Chernenko, I. Sysoyev, V. Zimoglyad, N. Tymun', A. Korzyuk, A. Baranovskiy, N. Nozhkin, V. Fal'ko, G. Batyunya, V. Dunayev, A. Gordiyechuk, and others.

There is no reason to doubt that the workers of the seaports, like all the employees of the sector, will celebrate their professional holiday — the Day of Maritime and River Fleet Workers — and the 60th anniversary of the formation of the USSR with new labor successes.

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OCEAN AND RIVER

OLD SHIP SUNK TO 'PLUG' BLACK SEA SHORE EROSION

[Editorial Report] Tbilisi KOMUNISTI in Georgian on 18 May 1982 page 4 carries Abkhazian correspondent I. Gobechia's 800-word report of an experiment to help stem erosion of Black Sea shore areas near the mouths of rivers: An obsolete research ship, the Inguri, is towed to the mouth of the Kodori River and sunk there. The idea is to "plug" the top of the underwater canyon that sucks in thousands of tons of sand and gravel and contributes to beach destruction. Such canyons characterize all the river mouths on the Black Sea coast owing to the marine topography, construction of dams up-river, river water withdrawal for irrigation, and the removal of sand and gravel as building materials. "Passive" techniques such as sea-wall construction are not so satisfactory.

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OCEAN AND RIVER

BRIEF

NEW SUPPORT VESSEL--In the second quarter of this year the Pinsk Ship Building and Repair Yard will complete the pilot ship of an original design, a technical servicing vessel for the non-self-propelled fleet, which is unlike anything seen earlier in domestic shipbuilding. Workers in all the production subdivisions of the enterprise are working on assembling the technical servicing vessel. Nonetheless, the collective of the hull-welding shop is making the greatest contribution to the common cause and the holiday labor campaign. This is where the brigades of ship assembly workers under yard veteran A. Pinchuk, electrical welders under A. Samsonov, and electricians under V. Mirchuk are working efficiently and creatively to join the hull and install the auxiliary quarters superstructures and electrical equipment. [by Ye. Tatur] [Text] [Moscow VODNYY TRANSPORT in Russian 4 May 82 p 4] 11176

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