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# USSR Report

TRANSPORTATION

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# USSR REPORT TRANSPORTATION

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## CIVIL AVIATION

MINISTER BUGAYEV REVIEWS 1983 CIVIL AVIATION WORK, SETS COURSE FOR 1984

Moscow GRAZHDANSKAYA AVIATSIYA in Russian No 1, Jan 84 pp 2-5

[Article by B. P. Bugayev, USSR minister of civil aviation: "The Time Dictates"]

[Text] The past year has brought many visible changes to the Soviet land. Rightly called the core year of the 11th Five-Year Plan, it inscribed brilliant, unforgettable pages in its labor chronicle. Accomplishing the decisions of the 26th Party Congress and the November (1982) and June (1983) plenums of the CPSU Central Committee, the workers of our country attained significant successes in all areas of communist construction. Socialist industry marched forward with a confident step. The work of transportation improved noticeably. The output of consumer goods is expanding and the Food Program is being realized. The authority of the Soviet state in the international arena is growing and strengthening. Its consistent policy of peace and collaboration between peoples and persistent struggle to control the arms race and prevent thermonuclear catastrophe are finding the broadest response in all corners of the world.

It is especially important that the positive shifts in virtually all spheres of the national economy were achieved basically without additional expenditures of material, financial, and labor resources. Here the main role was played by a rise in discipline and organization in various elements of our economy and public life.

Thus, the work, the start of which was marked by the decisions of the November (1982) plenum of the CPSU Central Committee, brought tangible results. And this pleases the Soviet people and inspires them to new labor achievements.

Together with all the country's workers, the civil aviation personnel ardently approve and support the Leninist course of our party and the activity of the CPSU Central Committee and its combat staff--the Politburo headed by Comrade Yu. V. Andropov. Struggling for the practical realization of the party's plans, the workers of Aeroflot accomplished the planned assignments and socialist obligations of the third year of the five-year plan. As a result of the efforts of command and supervisory personnel, party and public organizations, and all aviation workers the use of fixed capital was significantly improved and organization and discipline were raised on all production sectors. A substantial savings of labor and material resources was attained, first of all--of aviation fuel in short supply. The branch is giving the state a profit for the ninth year.

Just as in preceding years, preferential attention was devoted to the development of air transportation in remote areas of the Far North, Siberia, and the Far East which are also difficult to reach. The basic airports of this vast region began to receive the contemporary and comfortable Il-62 and Tu-154 airplanes which brought considerably closer to the center and resort areas of the country Petropavlovsk-Kamchatskiy, Magadan, Yakutsk, and a number of other cities. And the firstling of the Soviet wide-fuselage airplane building--the Il-83 airbus--is now accomplishing regular trips to the Novosibirsk airport of Tolmachevo.

The aviators did much work in the country's national economy. The contribution of our pilots to the construction of oil and gas pipelines, the construction of the Baykal-Amur Mainline Railway, and the servicing of other biggest construction sites of the five-year plan is well known. Recently, a group of workers from the Volga, Urals, and Tyumen' administrations were awarded orders and medals for successes attained in the construction of the gas pipelines, and six aviators of the Far East administration received the medal, "For the Construction of the Baykal-Amur Main Line." Among them are helicopter commanders N. G. Babkin, G. Ye. Zinchenko, and V. D. Shevkunov, aircraft technician I. P. Rusakov, dispatcher A. M. Ageyev, and flight mechanic A. I. Klopov. Ice reconnaissance crews displayed a high level of selflessness and professional skill during the past autumn. Under extremely difficult arctic conditions they helped a caravan of vessels with important national economic cargoes to break out of the captivity of the ice.

In accomplishing the decisions of the May (1982) plenum of the CPSU Central Committee, the personnel of Civil Aviation are making a substantial contribution to the realization of the Food Program. During the past year, more than 100 million hectares of agricultural land were treated from the air. Great assistance was rendered to the grain growers of the Ukraine, the Russian Federation, and Kazakhstan. Defoliation of the cotton plants in Uzbekistan and other cotton-growing republics was accomplished in compressed times and with high quality. More than 30,000 tons of fresh vegetables and fruits were delivered to residents of the country's northern and central regions in an efficient manner by air transport.

International air communication received further development. Despite the sharp aggravation of the situation in the world caused by the adventuristic course of Washington and its Western partners, the Soviet Union maintains regular air ties with 95 states of Europe, Asia, Africa, and America. Using the incident involving the South Korean spy airplane, the United States tried to block the activity of Aeroflot on foreign airlines and to impose its will on the regular session of the Assembly of the International Civil Aviation Organization --ICAO. But all these attempts failed completely. With the overwhelming majority of votes the USSR was elected to the ICAO council--the highest supervisory organ of that organization, and Aeroflot airplanes are successfully continuing flights in accordance with agreements which have been concluded.

In short, for the civil aviation personnel the past year was a year of strained and fruitful labor. Our branch, which marked its sixtieth anniversary at the beginning of the year, passed a difficult but honorable examination before the party and the people and in fact proved once more that it is equal to the most

difficult tasks. On the eve of the anniversary, 5 Aeroflot collectives and 1 educational institution were cited with high state awards, 15 air workers were awarded the title of Hero of Socialist Labor, and 34--the titles of Honored Pilots and Navigators of the USSR. Two thousand five hundred aviators were awarded orders and medals, among them 25 the Order of Lenin and 38--the Order of the October Revolution. And quite recently, last November, our glorious stock of gold was increased by the aircraft commander of the Sverdlovsk aviation enterprise, V. A. Prokudin, the aircraft technician of the Yakutsk aviation enterprise, I. N. Mikhaylov, the painter of aircraft repair plant 402, L. I. Grokhova, and Candidates of Technical Sciences I. I. Inyutkin and V. N. Konovalov. They were all awarded the USSR State Prize for 1983.

Civil aviation is to capture new positions in the coming year of 1984. It is planned to increase the volumes of air transport shipments to 180 billion passenger-kilometers. One hundred eight million passengers, 2,600,000 tons of freight, and 370,000 tons of mail will be delivered to various points of the country. In agriculture and forestry it is necessary to work 98 million hectares.

Typically, the planned volumes of work are dictated by the rigid limits of aviation fuel. This is why, in order to satisfy the demand of the population and the requirements of the national economy for air service, it is necessary to put into operation to the maximum all reserves of production and to ensure the strictest regime of economy and thrift.

A wealth of experience in skillful management has been accumulated in our branch. In the majority of the aviation enterprises there is a persistent struggle for the efficient use of airplanes and helicopters, a reduction in losses in work time, and a lowering of specific fuel consumption. It is necessary not to weaken this work in the future, too. A firm barrier should be erected to the accomplishment of trips with an incomplete payload and seat occupancy and idling of the aircraft for loading and unloading. The airplanes and helicopters, figuratively speaking, are our machine tools and machine tools should not operate at half strength.

This line is being consistently implemented by the aviation personnel of the Azerbaijan, Eastern Siberian, Kazakh, and a number of other administrations. The most important indicators of the efficiency in the use of aircraft, their payload and seat occupancy, exceed the branch average. And here the collectives of the Armenian, Arkhangel'sk, Georgian, and Yakutsk administrations have clearly lost sight of these questions. Here the work efficiency indices have not only not become higher, they have even been reduced.

In order to avoid such phenomena in the future, from the very first days of the coming year it is necessary to ensure the rhythmic and coordinated operation of all components of our aviation conveyer and to struggle persistently so that the state plan is successfully accomplished not only in its basic indices, but also in all calculated indices. It is also extremely necessary to attain a situation in which the state assignments are accomplished not only by civil aviation as a whole, but also without fail by each administration and each aviation enterprise. In the branch which is struggling for transformation to the standard in transportation, there should be no collectives which do not accomplish the plan



and do not keep their word in competition. We have all conditions so that each one works with the greatest return.

A great and important question which determines the operating efficiency of civil aviation to a great if not decisive degree is the efficient distribution of aviation equipment among the airlines and regions of the country. Airplanes and helicopters should be directed first of all where they are most needed and where it is expedient to use them. For frequently, air transport is used where a dense network of ground communications is developed and where the airplane or helicopter can be replaced by a bus or train. At the same time, at times aviation is poorly employed in the vast northern and eastern regions despite the absence of railroads and highways there.

In speaking of the efficient use of the airplane and helicopter fleet, I should like to direct special attention to a problem such as empty flights and additional and so-called lease trips. Far from all of them are dictated by urgent production necessity. Moreover, often serious omissions in the organization of work with customers and ignorance or an underestimation of our real capabilities are concealed behind them. As a result, aviation fuel which is in short supply is consumed uneconomically, the service lives of the airplanes and helicopters are depleted, and engines are written off ahead of time. It is time for the leaders of administrations and aviation enterprises to learn to calculate the cost of one or another trip and whether it is justified from the economic point of view. Time dictates the decisive rejection of obsolete work methods. A new type of economic thinking is now necessary which is aimed at initiative and socialist enterprise, at raising responsibility for the assigned matter, and at the search for those ways in the accomplishment of assignments which provide the best final results with the least expenditures. Only under these conditions will we be able to satisfy the country's requirements for air service, keep within the limits for fuel and be able to ensure the profitability of the branch as a whole.

One of the key tasks of the year and for the long term is the basic rise in the productivity of labor. Remembering the Lenin behest that the productivity of labor is, in the last analysis, the most important and main thing for the victory of the new social system, we should do everything to ensure the active transition to the branch's intensive development and to raising the return from each aviation worker. However, I should say directly that the rates of growth in the productivity of labor in civil aviation for the present still cannot completely satisfy us. Unfortunately, not all aviation collectives were able to switch over to work under conditions of a strict fuel economy regime. In a number of subdivisions and services the share of poorly productive manual labor is still great, which often leads to delays of trips and other losses. The outstripping growth in the productivity of labor in comparison with the growth in the average wage has not yet been achieved everywhere. The increase in the number of personnel, especially of management personnel, is not always justified.

Ways to increase the productivity of labor are well known. They are the introduction of the achievements of scientific and technical progress into production, the skillful use of progressive forms for the organization and stimulation of labor, and many others. But, perhaps, the most important in this matter is high organization and discipline and each aviator's strict accomplishment of his service duty.

As stressed by the General Secretary of the CPSU Central Committee and the Chairman of the Presidium of the USSR Supreme Soviet, Comrade Yu. V. Andropov, work on strengthening discipline does not require additional material expenditures but provides an extremely large impact. This is why the struggle to strengthen discipline and order in every possible way on all sectors of aviation production should become the moral standard of life of each labor collective and of each aviator.

Recently, the question of measures for the further strengthening of labor and production discipline in civil aviation was examined in detail by the board of the ministry. A major and principled conversation took place and a specific decree was adopted. And now it is a matter for the spirit of this document, as they say, not to disappear en route to the executors and for the requirements of the board to be brought to the minds and hearts of all aviation personnel.

Closely linked with labor discipline is financial discipline and a thrifty attitude toward national property and toward the use of material and financial resources. Unfortunately, despite measures which are being adopted bad management, wastefulness, and additions still flourish among us frequently. Moreover, many statements and obligations are articulated, but in reality serious divergences between word and deed are developed. For example, what is the worth of the declarations by the former leaders of the Dnepropetrovsk Aviation Enterprise, N. P. Grigorenko, A. I. Soldatenkov, and several others? In words, these sorry leaders zealously called for economizing in the large and small but themselves dipped their hands into the state's pocket. Or how about instances of scandalous mismanagement disclosed by the People's Control Commission in the Western Siberian and Uzbek administrations? By the ministry's orders, those guilty of these violations were strictly punished but it is not only and not so much a matter of punishments. It is very important to create those conditions in each collective with which there would be no soil for abuses and so that even the slightest violation of financial discipline becomes impossible.

Flying accidents and the preconditions for them are inflicting irreparable material and moral damage. Any mishap or breakdown of an aircraft results in tremendous losses for the branch and undermines the authority of civil aviation in the eyes of the passengers. Therefore, the struggle to improve flight safety and preserve aviation equipment on the ground is the most important direction of all our activity. We have worked out and are firmly implementing a course for the prevention of flying accidents and for the strict observance of the requirements of the documents which regulate the organization and accomplishment of flights. In no way should this work be relaxed. Primary attention should be devoted to the stability and teamwork of the crews, the well-organized work of the traffic service, and the weather support of flights. Flight safety is a complex problem and everyone should solve it: commanders, political workers, and party and public organizations.

The new Air Code of the Soviet Union went into effect from January of this year. We have received a document of tremendous state importance which clearly determines all the basic aspects of our branch's life and activity. Its comprehensive study has been organized in the Aeroflot collectives and important work has been initiated on bringing the various normative statements into conformance with it. Our common task is to achieve the indispensable implementation of all of the

code's provisions and to fill all the aviators' practical work with new content.

As is known, people decide the success of any matter. This truth is confirmed by life itself. The most difficult tasks are accomplished and the best final results are attained where highly qualified specialists are working and where experienced, energetic leaders stand at the head of the collectives. This is why the most fixed attention in the apparatus of the ministry as well as locally should be devoted to questions of the selection, assignment, and indoctrination of personnel.

Civil aviation has a large detachment of politically mature, competent personnel with initiative in all elements. They are skillfully implementing our party's course and mobilizing the broad masses of aviators for the accomplishment of state plans and the improvement of the quality indices of the branch's work.

For example, the chief of the Civil Defense Administration for the Central Regions, Hero of Socialist Labor and Honored Pilot of the USSR I. T. Khokhlov, persistently and purposefully leads the collective entrusted to him toward the attainment of lofty production goals. For many years in a row the administration was bogged down, but with the arrival of the new leader the situation changed radically. People had confidence in their strength and began to work with vim. As a result, the collective which lagged behind chronically began to occupy prize-winning places in socialist competition.

A lofty sense of what is new is inherent in the chief of the Belorussian administration, Honored Pilot of the USSR V. M. Kurilo. On his initiative, the subdivisions of the republic's agricultural aviation conducted a bold experiment directed toward improving the planning and accounting of aviation-chemical work. The initiators had serious difficulties but this did not stop the creative search. Soon life itself convincingly showed the advantages of the new system.

Of course, they are not born leaders, they develop. And this process proceeds more successfully where an environment of high party exactingness and devotion to principle is created and where the personal is closely interwoven with the social. Large collectives are confidently led by the commander of the Domo-dedova production association N. P. Novikov, the director of aircraft repair plant No 407, A. G. Yamov, the chief of the Yegor'yev Aviation-Technical School, I. G. Khaustov, and many other commanders of production.

But, unfortunately, there are also negative aspects in personnel work. At times, people are recommended for leadership posts without a deep and comprehensive study of their political, professional, and moral qualities. Appointments do not always take place in an atmosphere of broad publicity. Systematic work with a reserve for advancement is organized in far from all administrations and aviation enterprises. There are obvious defects in the selection of aviation specialists for work in the foreign representations of Aeroflot.

The most important task of the branch's personnel organs is to eliminate these and other shortcomings and to place on all decisive production sectors leaders who possess high organizational capabilities and enjoy authority and the respect of the aviators.

It is difficult to overestimate the role of ideological and political-indoctrinational work in the matter of the selection, assignment, and indoctrination of personnel and in the mobilization of the aviators for the accomplishment of national-economic tasks. It must be acknowledged that after the June (1983) plenum of the CPSU Central Committee this work in civil aviation became more purposeful and interesting, and its forms and methods were enriched. Political workers and party and public organizations are delving deeper into such urgent problems as strengthening labor and production discipline, raising the safety and regularity of flights and the style in serving the passengers, and the organization of socialist competition. The political and labor activity of the aviators increased noticeably. This was displayed especially clearly at the all-union Saturday of free work which was devoted to the 25th anniversary of the movement for a communist attitude toward labor. Tens of thousands of pilots, engineers, technicians, workers, and employees of Aeroflot took a most active part in the "Red Saturday," and gave the funds which had been earned to the national moneybox gratis. Our international aviators are up to the mark. Under the conditions of the massed attack against the socialist system by imperialist propaganda and the blunt provocations against Aeroflot they are accomplishing their professional and civic duty with honor during flights abroad and when servicing foreign air passengers.

In the future, too, we should spare no efforts to mold a staunch Soviet patriot and consistent internationalist in each aviation worker. The entire matter of indoctrination should be subordinated to carrying to the broadest masses of aviators the immortal Marxist-Leninist ideas, disclosing the unbreakable tie between our party's policy and the vital interests of the workers, and to creating in each person who wears the Aeroflot uniform which is dear to our heart an indefatigable fighter for the communist ideals.

As the party requires, ideological and political-indoctrinational work should be decisively freed from formalism and showiness and should be conducted profoundly and intelligibly. Leaders of aviation collectives, political workers, and party, trade union, and Komsomol activists should keenly catch the mood of people and give clear and accurate answers to all the questions which disturb them. Aeroflot veterans should be drawn more actively toward indoctrinational work. Their priceless professional and life's experience should become the property of young aviators. Being guided by it and striving to augment it, we will be able to join to the glorious traditions of civil aviation the future of our winged branch--those who are to fly and service the aircraft in the 21st century.

The aviation personnel are to accomplish tasks of great state importance in the new year of 1984. High organization and discipline, initiative, and a search for additional reserves will be required for the success of the matter. Serious efforts are required for the introduction of the achievements of scientific and technical progress into production, a further improvement in the style of control, and overcoming work forms and methods which have become outdated. Much will depend on the labor enthusiasm of the aviation personnel and on the scale and direction of socialist competition toward high quality indices.

Not to be satisfied with what has been done, not to be content with what has been attained, but to go onward without fail and achieve more without fail--this

Lenin behest should become the practical guide to action for each aviator, be he an ordinary worker or a leader of the highest branch echelon. Efforts should be continued on raising the activity of the broad masses of aviation workers and raising the role of the labor collectives in the realization of planned assignments and socialist competition. Everything which the branch has available should be used more efficiently and economically and everything which is interfering with forward movement should be overcome energetically and decisively.

Yes, the tasks are great and difficult. But there is complete confidence that the workers of our twice order-bearing civil aviation will cope with them in a worthy manner, will increase the tradition of glorious deeds, and will thereby make a new, significant contribution to the realization of the plans of the Leninist party.

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## CIVIL AVIATION

### BUGAYEV ON CIVIL AVIATION MINISTRY'S 1983 ACHIEVEMENTS

Moscow EKONOMICHESKAYA GAZETA in Russian No 7, Feb 84 p 2

[Article by USSR Minister of Civil Aviation B.P. Bugayev: "Aeroflot: On the Pathway of Intensification"]

[Text] Aeroflot started 1984--the 62d year of its activities--by occupying a prominent place in the country's unified transportation system. While having at its disposal relatively small fixed production capital it provided the state with a significant proportion of the profit from all transportation enterprises.

In accordance with the 1984 plan the volume of passenger flights is to reach 180 billion passenger-kilometers, insuring a growth of about 2 percent over 1983. Some 109 million people use the services of Aeroflot. More than three million tons of freight and mail will be carried by air.

One typical feature of this year's plan is that the volumes of aviation work are established by the limits on aviation fuel. A purposeful approach to economy and thrift is one of the most important prerequisites for all our activity. And this is understandable. Civil aviation is the largest consumer of energy resources, primarily aviation kerosene. The importance of thrift in the use of these resources at present-day scales can be seen from the following. Last year, each day we used more than twice as much fuel as for the whole of 1940.

During the last five-year plan questions of saving fuel acquired special acuteness and significance. It was possible to achieve improvement in the main indicator in this matter. Specific fuel consumption (the amount of fuel needed for unit of work) was steadily reduced. For example, compared with 1976 (the start of the 10th Five-Year Plan) we succeeded in improving efficiency in the use of aviation kerosene by almost 10 percent. During the past period this insured a relative saving of about 5 million tons. In other words, flyers operated with saved fuel for about 5 days of the year.

Another not unimportant circumstance is that during the first 3 years of the present five-year plan we have insured a 9-percent increase in aviation work, and during this period the absolute increase in the number of passengers carried was 16.2 billion passenger-kilometers while fuel consumption remained virtually unchanged.

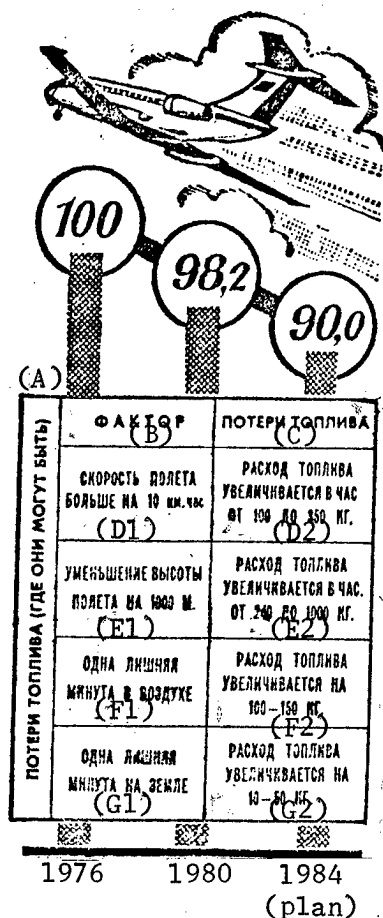


Figure 1. Reducing Specific Consumption of Aviation Fuel (1976 = 100%) and Reserves for Saving Fuel

Key: A Fuel losses (where they may occur)  
 B. Factor  
 C. Fuel loss

- |                                        |                                                              |
|----------------------------------------|--------------------------------------------------------------|
| D1. An extra 10 k.p.h. in flying speed | D2. Fuel consumption increases from 100 to 350 kg.           |
| E1. Reducing altitude by 1,000 meters  | E2. Fuel consumption per hour increases from 240 to 1,000 kg |
| F1. One extra minute in the air        | F2. Fuel consumption increases 100-150 kg.                   |
| G1. One extra minute on the ground     | G2. Fuel consumption increases 10-50 kg.                     |

\* \* \* \* \*

While in 1983 our pilots did 2 percent more aviation work they used less kerosene than in 1982. This trend will be further developed in 1984.

How is this being achieved? Mainly along three avenues that the Ministry of Civil Aviation Collegium considers major in the matter of saving aviation fuel.

First, it is a question of organizational-technical improvements. Flights completed by aircraft with gas turbines at lower speeds, and taxiing with partially closed down engines or by using special towing vehicles have a great effect. Steps have been taken to make maximum use of direct-line flying. Takeoff and climbing procedures have been rationally altered and optimal flight altitudes have been established. According to approximate calculations about 50-60 percent of all savings of aviation fuel are being achieved thanks to these factors alone.

A second direction is connected with improvement in the structure of flights. The stress has been laid on a steady and uninterrupted increase in the proportion of the heavy aircraft--the Il-86, Il-62, Il-62M and Tu-154--in the volume of work completed by civil aviation. At the same time steps have been taken to somewhat limit use of the An-24 and Yak-40, which as is known, were designed for short-haul routes. Naturally, these limitations affect primarily those regions of the country where the network of ground transportation is adequately developed.

Now, for example, we consider it inadvisable to operate the Yak-40 and An-24 on routes flown by the heavier aircraft since the indicator for fuel efficiency for the heavy transports is 1.5-2 times better than for the small aircraft. We think that the contribution made to saving fuel achieved from these measures amounts to 20-30 percent.

Third, fuel economy depends directly on the responsible attitudes and interest of personnel in cutting back consumption. Improvements are being made in the bonus system for aviation workers, primarily aircrews, for saving fuel. Responsibility has been established (including material responsibility) for the managers of aviation enterprises for observance of the limits established for aviation fuel and for not exceeding the values for the consumption of aviation kerosene.

Unfortunately, a businesslike and assiduous approach to the work has not yet become the rule everywhere. The Georgian, Moldavian, Tajik and Arkhangelsk administrations have not restricted themselves to the limits for the consumption of aviation fuel. Individual aviation enterprises are failing to meet plan targets, and the indicators for freight turnover by the aircraft inventory are deteriorating. We are dealing strictly with those who violate planning discipline.

The struggle to save fuel and energy resources in every possible way continues, and we are looking for all kinds of new ways and methods. In this matter we are acting hand in glove with the industrial ministries and administrations, primarily the Ministry of the Aviation Industry, and the scientific research and design organizations.

In the matter of saving aviation fuel the main directions in the work of industry are new engines with greater fuel efficiency and design improvements in aircraft aimed at enhancing their economical operation.

Merely by improving the condition of an aircraft's outer surface by better assembly work leads to 1.5-2-percent reduction in fuel consumption, and in



the final analysis to a greater number of passengers and a greater amount of freight carried. And how many reserves may be found in other sections! Aviation workers rightly expect further active work by the developers of new equipment in solving this important task.

The problems of intensifying the carrier process during 1984 are at the focus of attention in the collegium and economic services of the Ministry of Civil Aviation and all aviation workers.

The so-called hours spent dominated for a long time in evaluating activity in the operation of aircraft in the national economy. The main defects of this indicator are the same as in the "gross output" indicator in industry, construction and other sectors, when only rubles and tons are figured in the calculations. It has often happened that the plan for hours spent has been overfulfilled, but our clients remain dissatisfied: individual important work has been left unfulfilled.

Since 1982 an economic experiment in aviation for the national economy has been underway in the Belorussian Administration of Civil Aviation. Here the main indicator for evaluation is not hours spent but a specific physical indicator, namely the volume of worked areas, measured in hectares. And not only worked, but worked to a high quality and with high effectiveness. Changes have been made in the conditions of socialist competition for crews in agricultural aviation and for bonuses for the leaders of engineering and technical services and aviation enterprise employees working under the new system of planning and calculation of aviation chemical work.

The results obtained during the past 2 years have been most encouraging. Productivity for the An-2 aircraft and the Mi-2 and Ka-26 helicopters has risen 20 percent on average.

About 3,000 tons of aviation fuel have been saved, along with R200,000 in the wages fund. The prime cost of treating one hectare has declined 20.9 percent.

The total savings for the Belorussian Administration has been more than R1.5 million.

Taking into account the positive economic results from activity under the new system of planning, calculation and material incentive for aviation enterprises for chemical aviation work, it has been decided to extend this experiment during 1984. The Lithuanian and Turkmen administrations have been included in it, and also the largest agricultural aviation enterprises of the Volga [Privolzhskiy], North Caucasus and Ukrainian administrations of civil aviation. A decision on switching all agricultural aviation to the new work conditions will be made according to the results of the experiment during 1984.

I would like to deal with another matter that is directly linked to raising the level of management. This is improving the use of airliners. The very important indicator for commercial load and number of seats occupied on aircraft and helicopters considerably exceeds the average for the sector in the Kazakh, Uzbek, Azerbaijan and a number of other administrations.

At the same time this problem, to which, unfortunately, we have not been giving the proper attention recently, has become acute. It is a question of the so-called special-order flights and aircraft and helicopter chartering. By no means all of them result from any acute production need, and most of them are completed with a small commercial load and, consequently, an unsatisfactory economic efficiency. Moreover, they often hide serious omissions in the organization of work with clients. Poor control over their organization leads in isolated cases to abuses, distortions in accountability and the use of aircraft and helicopters for purposes other than those intended.

As a result there is inefficient consumption of aviation fuel, and in considerable amounts, and technical resources are used up ahead of schedule. I note, incidentally, that we consume a considerable amount of fuel for these purposes.

In organizing special-order flights the managers of our enterprises must be guided not by immediate profit but the national economic effect of the flight as a whole. And we expect our clients to do the same. Steps taken recently by the Ministry of Civil Aviation to bring proper order to special-order flights are aimed first and foremost at solving this problem.

Responding with practical actions to the decisions of the CPSU Central Committee December (1983) Plenum and the instructions and conclusions contained in the speech made by comrade Yu.V. Andropov, the collectives of civil aviation have resolved to insure an extra 1 percent in labor productivity growth over and above the 1984 plan, and to reduce the plan target for prime costs for aviation work by 0.5 percent. What must be done to achieve this?

At least 1 million extra passengers must be carried in 1984, thus insuring 1.8 billion passenger-kilometers, and 1.2 million hectares of agricultural land above the plan must be treated, with observance of the numerical limits established.

All this work must be done without additional fuel deliveries for the aviation enterprises. Improvements will continue in the structure of aviation freight carrying. The economists have calculated that increasing the proportion of heavy aircraft (the Il-86, Il-62M and Tu-154) by only 0.8 percent in the total volume of work will raise labor productivity by 1 percentage point. In this connection special significance attaches to extending the network of airfields capable of accepting large aircraft in the remote regions of the Far North, Siberia and the Far East.

Since the first days of 1984 the collegium of the Ministry of Civil Aviation has been constantly monitoring the course of plan fulfillment and socialist pledges. Work results for January indicate that the word of the aviators has been fulfilled in deeds. Plan targets for passenger turnover and passenger trips were overfulfilled 2 percent. Other plan indicators are being fulfilled preferentially.

The collectives of the Main Administration for International Air Communication, the Urals Administration of Civil Aviation, plant No 404 and many others marked Aeroflot Day, which this year is being celebrated on 12 February, with new

labor triumphs. Socialist competition is now being developed at all aviation enterprises and organizations within the sector for the fulfillment and overfulfillment of plan tasks and socialist pledges for 1984 and the 11th Five-Year Plan as a whole.

9642

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## CIVIL AVIATION

### MINISTRY OFFICIALS ON IMPROVING AIRCRAFT TECHNICAL SERVICING

Moscow VOZDUSHNYY TRANSPORT in Russian 15 Nov 83 pp 2-3

[Article by A. Solov'yev, chief, GUERAT [Main Administration for the Operation and Repair of Aviation Technical Equipment], MGA [Ministry of Civil Aviation] and V. Gorlov, deputy chief, GosNII for Civil Aviation: "Success Will Be Ensured by a Correct Strategy"]

[Text] The 12 and 14 July issues of VOZDUSHNYY TRANSPORT carried an article by Candidate of Technical Sciences N. Skuratovskiy, "Machinery in Old Packaging" which touched on a number of points in the matter of improving the technical servicing of flying machines. The publication evoked lively interest amid specialists, and was the subject of active discussion by engineers and technicians from the aviation machinery bases [ATB] of air enterprises and in the scientific establishments of the industry.

Many specialists aired their views on the subject on the pages of this paper. Published were letters by senior engineer for aviation and electronic equipment V. Lychagin from Bugul'ma ("Experience Studied But Not Put Into Practice"), engineer V. Sushko from Domodedovo ("What the Specialist Is Paid For"), aviation technician V. Chinkul ("Get Rid of the Old Packaging"), ATB Technology Department senior engineer V. Plakhotniy from Vladivostok ("Throwing the Gauntlet") and Kiev Air Enterprise ATB engineer Yu. Starkov ("My Wages Are Well Earned").

Today's article to a certain extent sums up the discussion of the important problem of improving the technical servicing of aircraft. The editorial board of VOZDUSHNYY TRANSPORT intends to continue devoting space to various aspects of the industry's efforts to improve the servicing of aviation equipment.

The need for higher efficiency in the operation of costly aviation hardware and the increasingly strict requirements concerning the safety and regularity of flights demand constant improvements in its servicing and repair. However, to reduce the problem to an immediate and sweeping transition to the operation of all aviation machinery "according to condition" would be an inadmissible

simplification. Both here and abroad it has been found expedient to resort to a flexible combination of different operational strategies: by actual running time, through parameter control (by technical condition), through control of the reliability level (to the limit). This combination can and must vary, depending on the type of machine involved, the specific modification of the aircraft parts and the operational conditions thereof.

This complex problem deserves a well thought-out approach, it cannot be solved easily or at one stroke no matter how much some overly optimistic scientists and operators would like it to.

To achieve a fundamental improvement in the operation of aviation machinery it is necessary to resolve a number of difficult and interrelated problems. This can be achieved only through the combined efforts of several ministries and departments. Work toward this goal is currently very much in progress. Among other things, several ministries have drawn up a coordinated plan to switch to the operation of aviation hardware according to condition. However, there are still many problems to be resolved.

To begin with, switching to the operation of aviation equipment according to condition is possible only if certain prerequisites are met. First and foremost, this equipment must have a sufficient degree of controllability. GOSNII Civil Aviation and NII Industry have worked out and approved a unified set of principles governing its maintenance as well as methods to test and evaluate its performance. Nevertheless, the provision of aircraft systems with built-in control devices is for now inadequate. Many of the aviation and radioelectronic devices deserve to be taken out of the plane, which not only involves a lot of additional labor and time, but is fraught with the risk of installing new malfunctions. The production of on-board cassette flight recorders has not been organized.

Built-in controllability, though, can be realized only if aviation equipment is provided by its designers with methodologies and algorithms for diagnosing malfunctions and selecting the operational mode. This, however, is not always done (though mandated by state standards), even with regard to aircraft engines, let alone other aircraft systems. Helicopters are inadequately provided with methodologies and control devices. Obviously, the problem cannot be resolved by our industry alone.

In order to incorporate progressive methods of operation into practice it is absolutely necessary that we organize the designing and serial production of modern, preferably automated, diagnostic and non-destructive control devices which by current state standards must be included in package deliveries of aviation equipment. At present this assignment is spread over several industrial ministries and is inadequately coordinated. In our own industry no pilot plant of this profile has been designated either. It should be pointed out that centralized deliveries of diagnostic and nondestructive control devices to ATB's are ineffectually organized, even though a standard list of diagnostic equipment for aviation machinery was drawn up by GOSNII Civil Aviation and approved by GUERAT.

Incorporating progressive methods of operation into practice is equally impossible without serious organizational measures at operator enterprises.

At the initiative of GUERAT and GOSNII Civil Aviation over thirty ATB's have organized special diagnostic laboratories whose functions include all aspects of aviation equipment reliability control, diagnosis of its technical condition as well as non-destructive control. The work of the laboratories are yielding some positive results. GOSNII Civil Aviation continuously provides them with methodological assistance either directly at the ATB's or by way of conferences and counselling at the institute itself. Each year the Kiev Institute for Civil Aviation Engineers conducts training sessions for ATB workers which run for 45 days.

In view of the constant development of diagnostics in the industry, the ministry issued a special directive determining the status of base diagnostic laboratories and elevating to that position several laboratories which have mastered advanced methods and means of diagnosing the technical condition of a definite type of equipment. These boast a well-developed material base and qualified engineering and technical personnel. Also taken into account was the presence in the ATB of a pilot technology and design bureau for the type of equipment in question. In addition to the duties assigned to ordinary laboratories, these base laboratories must provide thick methodological assistance to the diagnostic units of other ATB's appointed to their charge by virtue of the fact that the type of equipment they service and the diagnostic methods they use are those that the base laboratory specializes in.

The organization of diagnostic groups is planned for several ATB's which do a relatively small volume of work and where laboratories have not yet been created.

There can be no doubt that introducing, mastering and developing new forms of technical servicing calls for very complex measures to rectify the organizational structure of ATB's as a whole and the redistribution of personnel among the various divisions thereof. One step being contemplated is to study the possibility and the feasibility of reconsidering in part the goals and duties of technical control divisions (OTK) to improve their performance and if possible to concentrate all the work related to evaluating the technical condition and reliability of aviation equipment in one division of the ATB.

Also being studied is the possibility and feasibility of the creation in ATB's of a special shop or engineering center that would incorporate an OTK, a diagnostic laboratory, a technology department and a flight information decoding and analysis section.

The sensible thing to do prior to implementing the measures planned is, it would seem, to carry out an organizational experiment in several ATB's inasmuch as the abrupt and fundamental dismantling of established work methods would bring nothing but harm.

A meticulous review must be undertaken of the norms governing the workforce size of each ATB subdivision, leaving room for the establishment of diagnostic sections at those ATB's whose production volume does not exceed 50,000 converted units.

A number of the measures enumerated above figure in a relevant decree by the Ministry of Civil Aviation Collegium and in proposals approved by the deputy minister of Civil Aviation aimed at reinforcing and developing the ATB subdivisions engaged in controlling the reliability and diagnosing the technical condition of aviation equipment.

Currently being readied are revised versions of some very important documents-- the Aviation Equipment Operation and Repair Manual and the ATB Statute. Both will reflect questions relating to the development of progressive methods in the operation of air liners.

Practical experience urgently demands that diagnostics be included in technical servicing mandatory operations lists. For the present, though, there are difficulties here that stem from the uneven distribution of diagnostic equipment and computer systems among operator enterprises.

A variant of aviation equipment operation according to its condition is the operation of some systems by their level of reliability. However, the ongoing stock-taking of aviation equipment reliability levels and the data processing accompanying it do not allow a sudden transition to this type of operation strategy with any degree of responsibility. This problem must be resolved by civil aviation jointly with industry.

Envisioned for the near future is the organization of diagnostic subdivisions in the repair enterprises of the industry, and subsequently of standardized diagnostic complexes or centers equipped with automated information systems. Research into these areas is already being conducted by Aviaremont, GUERAT and GOSNII Civil Aviation.

Our scientific research institutes are faced with the complicated task of laying the organizational, scientific and methodological groundwork for the utilization of diagnostics as a step in the development of progressive methods of operation, of studying what specific operational systems are to be subjected to the diagnostic process. We must learn to compute the economic effect of introducing diagnosis.

Also topical is the question of training diagnosis specialists in VUZ's and aviation technology schools.

Consequently, the introduction and development of progressive methods in the operation of aircraft systems calls for a comprehensive resolution on an interdepartmental level of multifaceted and interrelated problems. A simplified perception of the issue can only discredit it.

12258

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## CIVIL AVIATION

### RIGA INSTITUTE SEEKING FASTER INTRODUCTION OF NEW TECHNOLOGY

Moscow GRAZHDANSKAYA AVIATSIYA in Russian No 10, Oct 83 p 24

[Article by V. Makeyev, prorector for scientific work of the Riga Institute for Civil Aviation Engineers: "Closer to Production"]

[Text] At the Riga Red Banner Institute for Civil Aviation Engineers imeni Leninist Komsomol, much has been done in recent years to improve the planning of scientific research work and to reduce the periods for introducing its results into production. The advisability of carrying out scientific research and experimental design operations in accordance with coordination plans and subject order cards, as a rule, is coordinated with the executors, which makes it possible for us to utilize the resources allocated for research better and more efficiently.

It is well known that a crucial and most critical area today is the introduction of the results of scientific research. This is why on average for all subjects the efforts of our scientists obtain "registration" in production every 1.5 years. In comparison with the 10th Five-Year Plan, we have brought about a reduction in the period of time for introduction by more than 6 months. Consolidation of our ties with sectorial administrations and production enterprises in civil aviation has played an important role in this.

Thus, owing to systematic assistance from "Aviaremont" and plant No 404, an automated system to analyze the quality of repair and reliability of aircraft engines has been introduced into industrial use, which has made it possible to significantly increase the operating life of TV-2-117 engines between overhauls. The economic gain, confirmed by the GlavPEU MGA [Main administration for Economic Planning of the Ministry of Civil Aviation], has amounted to 640,000 rubles annually.

Among the efficient developments of our scientists introduced into industrial use we may name the first phase of an automated system for diagnosing the basic functions of the systems of the Il-86 aircraft based on the accumulation, correlation and analysis of information from the flight data recorder. Introduction of the system ensures a high level of organization in the technical maintenance of the Il-86..



Based on a specialized system developed at the institute for monitoring the working order of aircraft engines according to their vibration characteristics, inspection of D-30 and NK-8-2u engines now is being conducted at many enterprises. The average annual gain for this development, confirmed by the GlavPEU MGA, amounts to 810,000 rubles. Again, the ministry's GUERAT [Main Administration for Operations and Repair of Aviation Technical Equipment] and the production enterprise--the Latvian Administration--which rendered great assistance to us in conducting controlled operation of the system on Tu-154B and Tu-134B aircraft, are at the sources of the introduction.

Technology for maintaining ground-based radio facilities for ensuring the technical status of flights with assigned labor-intensiveness to carry out preventive operations has been put into practice successfully. A number of radio communications and radar facilities have been switched over to this technology, which has improved the reliability of their work by an average of 1.8 times as much, with a reduction of labor-intensiveness in maintenance by up to twice as much. The economic gain, confirmed by the GlavPEU MGA, has amounted to 1.7 million rubles.

Under conditions of close interaction, a production enterprise may be not only an assistant in the introduction, but a participant in the development with equal rights as well. Thus, the indicating device for rough analysis of the water in aviation fuels and the methods for its use were developed by us jointly with the Latvian Administration and the GosNII GA [State Scientific Research Institute for Civil Aviation]. Effectiveness of the device's application has been verified at 11 airports in different climate regions. It is being introduced at air maintenance bases and in GSM [fuel and lubricant] services.

A number of other similar examples may be cited. After all, in 1982 alone, 39 scientific developments (when the plan called for 28) were introduced by the institute's scientists with an economic gain of 4,892,000 rubles.

Scientists of the VUZ are collaborating successfully with individual administrations of the Ministry of Civil Aviation, carrying out their specific assignments.

A system of automated preflight navigator training has been worked out jointly with the flight navigators department of the Latvian Administration for all flights and types of aircraft of the administration and is operating successfully. Training of the administration's crews has been conducted for 4 years on specialized navigation simulators created at the institute. An automated system for objective evaluation of crew activity on the integrated simulator for the Tu-134 aircraft has been introduced. Assignment of UKV [ultra short-wave: above 30 MHz] communications channels has been made and an automated weather broadcast unit has been introduced in the UVD [air traffic control] system by the institute's scientists. The diagnostic laboratory of the ATB [air maintenance base] at Riga airport is being equipped with prototypes of diagnostic instruments developed and manufactured in the institute. The "Gong" signal which sounds before announcements at the Riga airport was created voluntarily by the students design bureau. We also are making our contribution in work to turn the Riga airport into a model one.

The effectiveness of collaboration between the institute's scientists and customers is based on obligatory agreement on the technical and economic substantiation for work in its planning stage and joint development of a plan of organizational and technical measures in preparation for introduction. Assistance rendered by us to enterprises in training personnel, the supply of equipment, direct participation by our specialists in experimental or controlled operation of an innovation, and in drawing up the necessary documentation is of great importance.

Every year we conduct operations in accordance with approximately 80 contracts with the Ministry of Civil Aviation and the MAP [Ministry of the Automotive Industry].

Determining the circulation of results introduced at a base enterprise to other enterprises in the sector is a no less important task. If it has been determined by the plan for introductions, the task is simplified. If not, the work is carried out essentially on the voluntary service principle, within the framework of the same agreements on collaboration.

As we see, there are definite achievements in improving the effectiveness of research and in expediting its introduction into practice. But we have individual difficulties, too. VUZ's, as a rule, do not have the design and production base at their disposal for working out the necessary planning and technical documentation, for the manufacture and testing of prototypes of the simulators and instruments being created which meet the requirements of enterprises and organizations where we have to introduce the results of efforts. The VUZ contribution in developing and expediting scientific and technical progress is determined to a significant extent by the condition of its material and technical base. For this reason, the supply of VUZ's with modern equipment, instruments, automated facilities and computers should be improved.

Important and responsible tasks are facing the VUZ's of civil aviation in the 11th Five-Year Plan. All scientific research work has been directed at improving flight safety and regularity, aviation fuel economy, and technical maintenance of aircraft equipment and the sector's economic activity. We can solve these problems by improving planning and the mechanism for assigning personnel and allocating financial and material and technical resources, by more fully providing scientists with scientific and technical data, improvement in the mental and economic stimulation of researchers' labor, and by increasing labor discipline and responsibility of every collaborator for the successful results of work.

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## CIVIL AVIATION

### AN-32, AN-72 CARGO AIRCRAFT DISPLAYED IN MOSCOW

Moscow TRUD in Russian 19 Oct 83 p 4

[Article by N. Dombkovskiy: "Tomorrow's Aircraft"]

[Text] Today in the capital's Domodedovo airport specialists of the OKB [special design office] of the general aviation designer O. K. Antonov and the All-Union "Aviaeksport" Association are demonstrating models of the new multipurpose aircraft, the AN-32 and AN-72, to representatives of CEMA-country aviation companies.

Man is mastering the planet. He is penetrating into the deserts and tundra and climbing ever higher into the mountains. Roads are not being built at once and, therefore, aviation always goes first.

The AN-32 was designed specially for operation on high-mountain airfields and under hot climate conditions. Powerful engines permit it to take off and land at altitudes of up to 4.5 kilometers and to transport almost 7 tons of cargo over more than 2,000 kilometers.

The loading-unloading process takes literally minutes. For this, the fuselage is equipped with powerful lifts, a cargo ramp, and conveyer. In addition, the possibility of parachute-dropping cargoes and dropping parachutists is envisaged.

The younger brother of the "32," the AN-72, retaining all the advantages of its predecessor has acquired many new qualities. Effective mechanization of the wing and powerful jet engines permit operating it on airfields with short runways. An original landing gear provides it with reliable operation on regular dirt, coarse gravel, ice, and snow-covered airfields.

And one more innovation. The engines are placed on the upper surface of the wing. Because of this, lift is sharply increased, noise from the flying aircraft is reduced, and the landing of foreign objects in the air intakes is virtually eliminated.

...The first information on the innovations in the AN family caused the great interest of the specialists. The AN-32 and AN-72 have not yet reached the air routes; they are tomorrow's aircraft. But very little time will pass and they will appear at many airports.

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CIVIL AVIATION

AN-3 TURBOPROP CROP DUSTER. REFILED

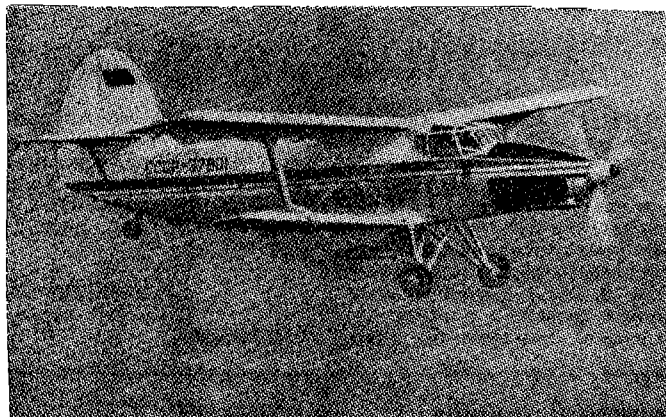
Moscow SOTSIALISTICHESKAYA INDUSTRIYA in Russian 4 Nov 83 p 2

[Article by T. Kuznetsov, engineer, Kiev: "A New 'Annushka'"]

[Text] This airplane is respectively called the "workhorse," and more affectionately -- "Annushka." Actually, 96 percent of the aviation work in agriculture is the share of the famous "AN-2." But the years make themselves felt and, it would seem, even non-aging machines become obsolete. And here, the "AN-3" is arriving already to replace the "AN-2." State tests confirmed the design characteristics of the new model which was created in the design office of the Chief Designer and Hero of Socialist Labor, Academician O. K. Antonov.

A pointed nose, streamlined and elegant shapes. A take-off run of only several dozen meters and the airplane gains altitude quickly.

"It was necessary to create not simply a new airplane," says Vladimir Yegorovich Zadorozhnyy, chief designer of the project. "We had the task of creating the replacement for the 'AN-2'--an honored airplane which had worked more than 1.5 billion hectares of plowed fields from the air. The 'AN-3' had to be made just as simple in design and reliable in operation as its predecessor and, at the same time, new improved technical qualities had to be achieved."



A compact gas-turbine unit is the chief special feature of the model. It multiplies the strength of the winged grain grower, doubling the rate of climb and increasing the load capacity by more than half a ton. The turboprop engine operates on kerosene which is half as expensive as gasoline and significantly safer in operation. More comfortable conditions are being created for the pilot's work. A modern air conditioning system maintains a temperature of 18-20 degrees in the cockpit. The noise level and shaking caused by the power plant are incomparable with those existing on the "AN-2." Many interesting solutions have been used in the agricultural equipment which the associates of the design office developed jointly with specialists of the All-Union Scientific Research Institute for the Employment of Civil Aviation in the National Economy and the Riga Institute of Engineers for Civil Aviation. The majority of the assemblies are made at the level of inventions and have been confirmed by authors' certificates.

The capabilities of the new aircraft are considerably broader and it is well adapted for work on the modern field. Self-refilling of the agricultural tank, forced separation of the liquid chemicals which excludes the possibility of their landing on adjacent fields, the use of reverse to reduce the length of the landing run, and operation of the engine with a braked propeller are envisioned. An advantage of the new aircraft is high productivity which exceeds one and one and one-half fold the productivity of the "AN-2." The working cost is reduced by 29-37 percent depending on the work being performed. One person pilots the "AN-3." Preparations for the series production of the new airplane are now under way.

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CIVIL AVIATION

140-KILOMETER FUEL SUPPLY PIPELINE PLANNED FOR KURUMOCH AIRPORT

Moscow VOZDUSHNYY TRANSPORT in Russian 15 Nov 83 p 2

[Interview with R. Khobotov, chief, Volga Administration Fuel and Lubricant Service by correspondent A. Sherstnev: "Refueling Will Be Guaranteed"]

[Text] The very high intensity of traffic in the mass haulage period causes additional difficulties in the work of various airport divisions. One of these has to do with fuel deliveries by railtransport. The least little discrepancy can lead to a foul-up. The Kurumoch airport, the largest in Aeroflot's Volga Administration, has had its share of disruptions caused by the fuel problem. What is being done to liquidate this bottleneck in the work of the airport? Our correspondent A. Sherstnev posed this question to R. Khobotov, chief of the Fuel and Lubricants Division of the Volga Administration.

[Answer] I will not dwell on our ongoing business relationships with the Neftesnab [Oil Supply] Organization and the railroads. We manage to resolve many problems with them on the operational level to ensure rhythmic deliveries of fuel. Much more important for us is the long-range perspective. In this respect I think a very important decision has been taken which is currently being implemented. I refer to the construction of a fuel supply pipeline from the Novokuibyshevsk Oil Refinery to the Kurumoch airport.

The line will run 140 kilometers and will cross two rivers--the Samara and the Sok. The diameter of the pipe is 200 millimeters. Overall it is a rather intricate engineering structure, the entire line is provided with anti-corrosion and cathode protection and with telemechanical and communications systems. The television circuit, for example, allows the work of the pipeline to be controlled directly from the refinery, such as monitoring its operation and keeping an eye on the smooth functioning of various assemblies and machines.

[Question] What phase is the construction in now?

[Answer] The client is the Kuibyshevnefteorgsintez Association. Both the client and the general contractor--the construction trust Kuybyshevtruboprovodstroy--displayed a highly responsible approach to the construction of this project, a

very important one for our civil aviation. Fifty kilometers of pipe have already been laid. Work is being conducted simultaneously at three sites. In addition, a specialized subcontractor organization has done all the necessary work to cross the Samara. The filtration station is currently being assembled at the refinery, and gauges are being installed. The refinery's pumping facilities will be hooked up to the pipeline: this will permit the kerosene to be force-pumped into the pipe at a pressure of 70 atm, thus ensuring a reliable fuel inflow.

We are positive that in November of this year all the work on the line will be completed.

The client is willing to provide assistance on the section assigned to the air enterprise and the territorial administration, i.e., in the reconstruction of the fuel and lubricants storage facilities at Kurumoch. Basing our position on the lessons learned from the operation of a similar fuel supply line in Ufa, we have found it necessary to enter some corrections into the reconstruction design project executed by Aeroproekt. The layout originally proposed, especially in the technology part, did not provide for a number of important elements in the pumping process. In particular, there was no reserve line planned, no dirt trap and not enough filters....

In a word, a large number of blueprints have to be done in a short period of time. This work is likewise being shouldered by the Kuybyshev affiliate of VNIPI Petroleum Industry. The construction part is the client's responsibility.

[Question] How will the erection of the fuel supply line benefit the air enterprise?

[Answer] Regularity will be achieved in fuel deliveries, and will cover not only the projected increase in traffic in the immediate future, but the growth of the Kuybyshev Air Enterprise over several five-year periods ahead. This will doubtlessly exert a favorable influence on flight schedules.

Operation of "the pipe" guarantees timely refueling not only for our own fleet, but for transit craft as well. We can speak here of the interests of the industry as a whole, not just the air enterprise. The experience of Ufa seems to back up this conclusion. It is not for nothing that the Ufa airport is considered to be the most reliable in terms of servicing and handling air traffic by flight personnel.

[Question] Won't this translate into additional "problems" for the airport itself? After all, your neighbors will be sorely tempted to direct traffic to Kurumoch for refueling.

[Answer] I don't think anything terrible will happen. Ufa handles over 13,000 above-plan takeoffs annually. If production is well organized, if the brigade-contract method is widely applied, the novelty will not produce any serious complications for any of the airport's divisions. In addition, to facilitate

servicing the centralized fueling system must be utilized to its full capacity. So far this important reserve is not being used in the best possible way. Much more important, however, is the fact that the line will enable us to meet our main goals--improving the regularity of flights and improving the quality of service. That is why construction will begin next year of one more fuel supply pipeline, this one in Gorkiy. The 50-kilometer line will link the local airport with the Novogor'kovskiy Oil Refinery. The problem of satisfying the fuel needs of the three largest airports in the Volga administration will be resolved.

12258

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## MOTOR VEHICLES AND HIGHWAYS

### INSTITUTE DIRECTOR ON CEMA COOPERATION IN MOTOR VEHICLE TRANSPORT

Moscow GUDOK in Russian 6 Dec 83 p 4

[Interview with Viktor Nikolayevich Ivanov, doctor of technical sciences and director of the Motor Transport Scientific Research Institute, by G. Tarakanov, chief of the Mass Information Department of the RSFSR Ministry of Motor Transport: "The Reliable Shoulder of a Partner"]

[Text] The decisions of the 26th CPSU Congress call for further development of the USSR's economic, scientific, and technical cooperation with CEMA member countries. The goal is to achieve assimilation among the structures of economic mechanisms and to improve direct ties between ministries, associations, and enterprises in fraternal countries.

How is cooperation between scientific organizations and enterprises of the RSFSR Ministry of Motor Transport and enterprises and organizations in CEMA member countries developing? Here is what Viktor Nikolayevich Ivanov, doctor of technical sciences and director of the Motor Transport Scientific Research Institute, had to say on this subject.

He emphasized: "Direct scientific and technical ties form the foundation for this type of cooperation. We are constantly exchanging technical specifications on issues involving management of the sector, organization of the shipping process, technical servicing of motor vehicles and motor vehicle repair, introduction of automated control systems, and conservation of fuel and power resources.

"Every year cooperation plays a larger role in research and development. Within the framework of cooperation, on the basis of division of labor, partners solve the most important scientific and technical problems. The Motor Transport Scientific Research Institute makes an major contribution to this work. For almost 20 years we have been working in cooperation with the Motor Transport Institute under the Polish Ministry of Railways and with the Scientific and Technical Center for Rationalization of Motor and Urban Transport under the GDR Ministry of Transportation. In the 10th Five-Year Plan cooperation was established with transportation scientific research institutes in Bulgaria and the Mongolian People's Republic. This is the third year that our Motor Transport Scientific Research Institute has been providing methodological assistance in developing transportation science in the Republic of Cuba.

"Scientific and technical ties of this nature benefit us as well as our partners. Soviet and Bulgarian specialists developed recommendations for the optimum size and specialization of motor transport associations, and for types of shipments that should be switched over to general-use transport. These recommendations are now being used extensively in Moscow, Penza, and a number of other oblasts in the RSFSR. As a result, for example, of concentrating equipment in large territorial associations, motor transport resources have been used more efficiently in recent years.

"Other joint work done by Soviet and Bulgarian specialists is also of scientific and practical interest. They created a model for organizing technical services at motor vehicle enterprises based on concentration of rolling stock. This model was tested in Kirov Oblast and in various districts in Bulgaria and recommendations were made to put it into practice.

"We can offer another specific example: in Hungary, experience has been gained in establishing transport balances in various parts of the country. This experience was taken into account when the Motor Transport Scientific Research Institute was introducing model industrial processes for delivering agricultural freight through the entire cycle--from production to consumption.

"Soviet and Hungarian specialists improved the system for utilization and repair of the "Ikarus" buses. Introduction of the improved system at the Kaluga Repair Plant made it possible to speed up the repair of these buses significantly."

V. Ivanov went on to say: "Our institute's collective helped our Hungarian friends improve the technical servicing and minor repair and maintenance system for the ZIL-130 trucks [produced at the Moscow Motor Vehicle Plant imeni I. A. Likhachev] that are used in Hungary.

"Joint research conducted by the Motor Transport Scientific Research Institute and scientists from the GDR has been quite useful. Thanks to this research, more efficient methods are now being used to deliver building materials and commercial and perishable freight by making use of specialized rolling stock.

"The research done by Soviet and Polish specialists is quite varied. In collaboration with colleagues from Poland, scientists from the Motor Transport Scientific Research Institute introduced a process for repairing spare parts using polymer materials and electrochemical methods; they also created original instruments for diagnostic evaluation of motor vehicles and for measuring fuel consumption.

"The fruits of our cooperation with comrades from the Mongolian People's Republic are becoming more and more noticeable. Our joint efforts are directed at improving the technical maintenance and repair of motor vehicles and at introducing progressive methods at motor transport and motor vehicle repair enterprises in the MPR.

"Bilateral scientific and technical cooperation between enterprises and organizations under the RSFSR Ministry of Motor Transport and related

organizations in other socialist countries is of great interest to both partners. In addition to the contacts that have been established between scientists' creative collectives, there are plans to organize close cooperation between production enterprises. This will make it possible to introduce progressive methods into motor transport more rapidly and to solve problems of joint production of garage equipment and utilization of automated control systems in the technical maintenance and repair of machinery. Joint efforts will be used to solve many other pressing problems."

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## MOTOR VEHICLES AND HIGHWAYS

### ZIL MOTOR VEHICLE PLANT'S COOPERATION WITH CSSR FIRM

Moscow EKONOMICHESKOYE SOTRUDNICHESTVO STRAN-CHLENOV SEV in Russian No 8,  
Aug 83 pp 62-64

Article by Valeriy Podkolzin, member of the CEMA Secretariat: "ZIL  
Cooperates With Avia-Praga"

Text Neither of these enterprises requires a special introduction. Both are well known in their countries and far beyond their borders. But the reader may ask a legitimate question: "Why does the Automotive Plant imeni Likhachev ZIL have cooperative arrangements with an enterprise titled Avia-Praga? Hence, it is worth telling a little about these enterprises that are seemingly unrelated in terms of their production but in whose history we shall see a great deal that is common. Both enterprises were established at the beginning of this century: the ZIL Association (formerly MAC Moscow Automotive Company) in August 1916, and the Avia firm soon after World War I.

ZIL's work force has rich revolutionary traditions. On 28 June, 1918, V. I. Lenin addressed a rally of MAC workers. During the Civil War the plant repaired trucks and passenger cars of various makes for use at the front. On 7 November, 1924, the first 10 ton-and-a-half trucks created by the hands of Soviet workers and engineers led a column of demonstrators in Red Square. That day is considered the birthday of the Soviet automotive industry.

ZIL's services in the country's industrialization were extremely great. The Moscow Automotive Plant imeni I. A. Likhachev has been awarded three Orders of Lenin, Orders of the October Revolution and the Red Banner of Labor for excellent organization of the production of munitions and arms during the Soviet people's struggle against Hitlerite fascism and for fulfilling its postwar five-year plans ahead of schedule.

"Today," says Deputy General Director A. I. Buzhinskiy, "in terms of its technical level and automation of production, ZIL holds one of the first places in the world among enterprises producing medium trucks. One such vehicle rolls off its assembly line every minute and a half."

ZIL-130, -131, -133 and -157 KD trucks are frequently seen on the highways of the fraternal socialist countries. S. V. Shumov, chief of the export

division, told us that 90% of all export is sent to these countries. ZIL products make up substantial portions of the truck fleets of the People's Republic of Bulgaria /PRB/, the Hungarian People's Republic /HPR/, the Republic of Cuba, the Mongolian People's Republic /MPR/ and the Polish People's Republic /PPR/,

Through cooperative production arrangements, ZIL supplies components to the PRB, steering mechanisms and universal shafts to the HPR and chassis to the PPR. ZIL provides maintenance service for the vehicles it delivers, and it trains national personnel either at the association's enterprise or in the importing countries.

And here is another aspect of cooperation: Producers of industrial trucks in Bulgaria call ZIL their testing ground: More than 3,000 Bulgarian lift trucks are used at the plant in practically all its internal operations.

One must not fail to mention another type of product put out by ZIL--granted, not one of its basic ones. These are household refrigerators. Thirty percent of them are exported, and more than 25,000 are delivered annually to the socialist countries.

And now a few words about the history of the Avia-Praga enterprise. At first it produced sport and passenger planes, which were renowned for their design perfection and reliability. But after large planes that are imported mainly from the Soviet Union started flying on Czechoslovak airlines, the era of automotive production replaced the era of aviation production. Since 1960 the enterprise has produced large flatbed trucks and dump trucks, the Praga-VZS and the Praga-SST, which are suitable for work under difficult road and climatic conditions. At the end of the '60s the enterprise started producing small trucks (the Avia A-20 and the Avia A-30). These trucks are shipped to the HPR, the PPR and many other countries of the world. Avia-Praga's work force also has performed great revolutionary services. In May 1945 Avia-Praga's workers fought on the streets in the Prague uprising with guns in hand.

For several years now scientific-technical, sociopolitical and cultural cooperation has taken place through the exchange of scientific and technical information and of experience in production and social work between the work forces of the ZIL and Avia-Praga enterprises, which, as we have now seen, are related in terms of production.

"Furthermore," says N. A. Ukelov, chief of the association's foreign relations division, "we exchange delegations. The chief distinctive feature here is that the exchange takes place on the basis of equivalency, without any currency involved, according to the principle 'from machine tool to machine tool.' In other words, workers and specialists from both enterprises perform the same work 'as visitors' as they do 'at home.'"

In 1981-1982 our specialists who visited Avia-Praga studied the production technology and quality control in the manufacture of carburetors; technology

and equipment for manufacturing the principal components of diesel engines' fuel apparatus; the mechanization and automation of control to ensure the air-tightness of vehicle body parts and assemblies, etc. This permitted them to submit a number of important proposals, including a proposal to alter the design of the carburetor needle valve, which will increase its safe life by a factor of approximately 1.2, and proposals to introduce a new tap for cutting threads and knurling tools with an altered knurling angle.

At the plant's managerial offices I was shown a plan for the exchange of specialists between the Moscow Automotive Plant imeni I. A. Likhachev and Avia-Praga in 1983, signed by both the enterprises' general directors, party committee secretaries and trade-union committee chairmen.

The plan is detailed and extremely extensive in content. It includes 10 subjects that will be worked on by specialists sent from one enterprise together with engineers and technicians of the host enterprise.

It is known what great importance the CEMA countries attach today to the saving of fuel, energy and raw materials in every possible area, including reduction of the metals-intensiveness of production. In accordance with this objective, ZIL will receive specialists from Avia-Praga to work on the methods and forms of rationalizing the use of metal in production, capital repair and the rebuilding of parts.

Another promising subject that specialists from both enterprises will examine at ZIL concerns the design and manufacture of special devices and specialized machine tools. In our time of the extensive automation of production, electronics and robot technology, the joint treatment of this matter and the exchange of experience in this area are extremely essential. The plan for ZIL as the host side also includes the extremely important subject of enhancing the effectiveness of work in the area of inventions, efficiency proposals and technical and economic information.

ZIL and Avia-Praga are among 3,500 enterprises in the CEMA countries that maintain direct scientific-technical and other ties today. The effectiveness of such ties for our countries' national economies is extremely great. Comrade Yu. V. Andropov, General Secretary of the CPSU Central Committee, has emphasized this. "The countries of the socialist commonwealth," said Yuriy Vladimirovich Andropov, "possess great technical potential and skilled scientific personnel, specialists and workers. The better we are able to pool and put this invaluable capital to work, the faster and more successfully we shall be able to resolve the diverse economic and social questions on which our peoples are working."

According to the exchange plan, ZIL specialists will visit Avia-Praga and study the questions of the organization of technical and economic planning, record keeping and the analysis of economic performance there. In addition, they will visit other automotive enterprises in the CSSR (the Tatra, Skoda and Motorpal Plants). There Soviet specialists will familiarize themselves with new methods of sheet-metal stamping and with technologies for the smelting,

casting and heat treatment of piston materials, and for the mass production of spray nozzles and fuel injectors for diesel trucks.

"This sort of expansion of cooperation," says N. A. Ukolov, "is perfectly natural. After all, in addition to the head plant, the ZIL Production Association includes more than 15 large specialized enterprises. Therefore, the deeply developed production specialization and cooperation within the association require correspondingly broad-scale cooperation with related enterprises in the other CEMA countries."

As an example, one can cite joint work between specialists from the Moscow Carburetor Plant (a branch of ZIL) and specialists from the Czechoslovak Autobrzdny enterprise. The first stage of this work has been completed, and a plan has been signed for 1983-1985 that provides for developing the base design and advanced technological processes for the production of hydraulic shock absorbers. Implementation of the results will make it possible to raise the performance indices of these products and produce them more efficiently.

Specialists from ZIL and the Czechoslovak Motor enterprise are working together to develop new power-supply instruments for truck engines and to improve the production of series-produced carburetors manufactured by the Moscow Carburetor Plant. By optimizing their characteristics, they propose to reduce the toxicity of exhaust gases by 25% and improve fuel economy by 5% to 7%.

Following a visit by ZIL specialists to the Czechoslovak Motorpal Plant, the two enterprises signed a plan for joint work in developing fuel apparatus for eight- and six-cylinder ZIL engines based on the design of Motorpal's high-pressure fuel pump.

As we have already said, in addition to the exchange of specialists and workers by ZIL and Avia-Praga, sociopolitical and cultural cooperation also take place. Both collectives have a great desire to know as much as possible about each other's life, especially about how each is carrying out the decisions of its Communist Party's congress--the 26th CPSU Congress and the Czechoslovak Communist Party's 16th Congress.

Members of party and trade-union delegations share experience in organizing socialist competition. Photo exhibits are set up regularly, every other year, directly in the enterprises' shops. They find it interesting to tell each other how their enterprises' workers acquire advanced training. At ZIL more than 25,000 persons study every year; of these, more than 6,000 study in permanent educational institutions--the plant higher technical school, two technicums, schools for foremen, drivers, etc. Avia-Praga also has its own vocational-technical school, plant courses, schools for young workers and technicums. All this is evidence that the doors to knowledge and all-round personal development are wide open to the fraternal socialist countries' working people.

Experience is also exchanged with regard to many other social-questions: labor protection, medical care, housing construction and employee rest and leisure.

The cooperation plan provides for an exchange of sports delegations and groups of vacationers. This is very important from the standpoint of establishing personal contacts and learning about the countries' histories and their working people's everyday life.

"Children have not been forgotten, either," says L. Ye. Kazakova, director of the mass culture sector of the association's trade-union committee. "Since 1918 our employees' children have gone to a Czechoslovak Pioneer camp in a picturesque spot on the Sumava River every other year, and on alternate years we host children from fraternal Czechoslovakia at our plant's Vostok Pioneer Camp. Of course, we cannot send everyone who would like to go. Therefore, the main prerequisites for making the trip to the fraternal country are good academic performance and a high degree of activeness in Pioneer work. All this does a great deal to help our childrens' international upbringing and foster the establishment of friendship between them that frequently continues after their stay at the Pioneer camp.

We have discussed here the main areas of cooperation between the ZIL and Avia-Praga collectives. With every passing year the bonds of friendship and brotherhood that join them grow stronger and expand, and the unity and cohesiveness of the peoples of the Soviet Union and the Czechoslovak Socialist Republic grow at the same time.

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## MOTOR VEHICLES AND HIGHWAYS

### PROPOSALS FOR IMPROVING TRUCK TRANSPORT SYSTEM

Moscow SOTSIALISTICHESKAYA INDUSTRIYA in Russian 1 Dec 83 p 2

[Article by R. Krylov, senior scientific associate at the North Caucasus Affiliate of the Motor Transport Scientific Research Institute in Krasnodar: "Motor Vehicles Need Skillful Management"]

[Text] Shipments by motor transport have become an integral industrial link in providing economic ties among all sectors of the national economy. Since the volume of production output is growing in every sector, the volume of shipments should be increasing as well. But this correlation is not being maintained. Motor transport is not meeting the sectors' demands for shipments. In the North Caucasus region, for example, last year motor transport enterprises shipped 80 million tons less freight than in the previous year. This same trend is continuing this year: over the first 9 months, 12 million tons less freight was delivered to consumers than during the corresponding period last year.

Shortfalls in transport services are usually explained by two factors: the structure of the motor vehicle fleet does not correspond to the time demands and there is a shortage of motor vehicles.

As far as the first factor is concerned, it is true that the technical parameters of the motor vehicles that are produced do not correspond to the nature of production in industry, the construction industry, and agriculture. But at the same time, the shortage of motor vehicles is clearly exaggerated. We agree with UkSSR Minister of Motor Transport F. Golovchenko, whose article was published in SOTSIALISTICHESKAYA INDUSTRIYA on 22 November, that the root of the problem does not lie in a shortage of motor vehicles, but in inefficient utilization of the existing fleet and in the lack of coordination among departments, which makes it impossible to exercise skillful management on a broad scale.

For a long period of time each individual sector of industry has had its own independent transport system. This has resulted in a dissipation of resources and spare parts and like mushrooms after a rain, motor pools, columns and garages have sprung up everywhere--they may be tiny, but they are the sector's "own". This has resulted in people treating a huge dump truck like a horse on a farm: if I want it, I'll harness it and if I don't want it, I'll tie it up anyway. Finally, this has resulted in an inability to take into account the

costs to the country of this "stall" approach to motor vehicles and to evaluate the transport costs as part of the cost of a final product, which in certain cases reaches 50 percent.

The opinion has been expressed that intersectorial shipments on long-distance routes should be carried out by general-use transport that belongs to republic motor transport ministries. This is certainly a connecting link in the chain of a unified shipping process. But this chain has some weak spots. Let's take a look at the statistics for the North Caucasus region. Here general-use transport enterprises account for only one-fourth of the total shipments. Is there any possibility of increasing this indicator? Not really, since the proportion of the motor vehicle fleet used by enterprises of the Ministry of Motor Transport does not even reach 15 percent and there is a trend toward even further reductions.

It seems to us that the solution lies in making some decisive changes in the organization of the national economy's transport services--first and foremost in concentrating the motor vehicle fleet and introducing a fundamentally new system for managing the fleet on the basis of interdepartmental coordination.

The advantages of coordination can be judged by examining the experience of the Novorossiysk Motor Vehicle Combine. Here about 1000 trucks were organized into 9 specialized columns that perform practically every type of transport operation. During the eight years since its formation, the motor vehicle combine has created a powerful production base, which could be the envy of any other motor vehicle repair plant. The reliable technical condition of the motor vehicles has made it possible to organize what is essentially a two-shift operation of rolling stock. Now the motor vehicle combine is using its own resources to complete installation work at a high capacity container lot that is equipped with the latest equipment. This will make it possible to increase significantly the proportion of work performed by one of the most progressive forms of freight shipment and to free up thousands of railcars from intra-regional shipments.

Is it within the power of small-scale motor pools to organize their shipping operations at this same level? Of course not. Also in Novorossiysk, for example, there are 15 garages operating under just one department, the city municipal services department. The technical, economic, and social indicators of the work done by these enterprises could not be any lower. The coefficient of utilization of the rolling stock is one-fourth to one-fifth that of general-use motor vehicle enterprises. This situation is not difficult to find in any city in the region.

Of course, the concentration of the motor vehicle fleet is not a simple matter and it requires time and funds. Therefore, today a top priority problem is fundamental reorganization of the system used to manage the motor vehicle fleet. Many people throughout the country know of the practice in Saratov of organizing the operation of motor transport for the harvest, when all the transport facilities are under the control of one manager. The Saratov system is seasonal, however. The next step must be taken. There should be year-round services in operation for interdepartmental coordination of the work of the entire motor vehicle fleet that is distributed throughout the rayon, oblast,

kray, and republic; and transport services should be turned into a process that is subject to overall management and control.

We already have some experience in putting this approach into practice. This is the sixth year that an interdepartmental coordination and motor vehicle fleet management service has been operating as an irregular department of the rayon soviet executive committee in Krymskiy rayon, Krasnodar Kray. A direct result of the service's operation has been a 300,000 ruble decrease in annual transport expenditures. During the intensive harvest campaign the rayon even manages to get by without bringing in motor vehicles from the outside.

A group of scientific associates at the North Caucasus Affiliate of the Motor Transport Scientific Research Institute used a similar principle to develop a proposal for organizing motor vehicle shipments at the Krasnodar Transport Center. An irregular department of freight shipping was created by a decision of the city soviet executive committee; it has succeeded in regulating the shipping process to a certain degree. The results are encouraging: the delivery of building materials to construction sites has been improved and the layover time of railcars during loading and unloading operations has been reduced.

Taking into account this positive experience, last year the RSFSR Ministry of Motor Transport approved a model provision for services that would provide interdepartmental coordination and truck shipping management in oblasts (krays and ASSR's) in the RSFSR.

The major advantages of the new system are that acting as an irregular agency under the Council of Ministers of an autonomous republic or the soviet executive committee of a Council of People's Deputies in a kray, oblast, town, or rayon, the interdepartmental coordination service takes on functions of controlling the operation of a departmental motor pool, and it sees to it that the motor vehicle fleet is brought in to help ship national economic freight in the most important directions of the freight flow. Only by making better use of the carrying capacity of departmental motor vehicles will we be able to make up a significant portion of the transport deficit.

A decision was made to start experimental verification of the viability of interdepartmental coordination services in Krasnodar Kray this year. This plan did not go beyond mere good intentions, however. And strange as it may seem, the ministry itself put the brakes on. The ministry's Freight Main Administration (V. Konoplin, chief) literally blocked any possible resolution of the issue. One gets the impression that this administration needed the provision for organizing an interdepartmental coordination service, the development of which it ordered and financed, for a notorious "check mark" that is supposed to be evidence of a commitment to scientific and technical progress.

At a meeting of the Politburo of the CPSU Central Committee when the proposals worked out by the USSR Council of Ministers for increasing the efficient utilization of motor vehicle resources in the national economy were under discussion, emphasis was once again placed on the need to implement specific measures to improve planning of freight shipments by general-use motor

transport and by motor transport under ministries and departments. It seems that the organization of interdepartmental coordination services is just such a measure, which will make better planning possible, in addition to better control over the operation of motor transport within the boundaries of each region.

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## MOTOR VEHICLES AND HIGHWAYS

### ELECTRIC 'UNIVERSAL' LOADER IN DEVELOPMENT

Moscow GUDOK in Russian 17 Dec 83 p 4

[Article by Yu. Vereshchagin: "Universal Loader"]

[Text] On 13 November of last year a report was published in GUDOK titled "Vibration in the Equipment", which told of the remarkable invention developed by scientists at the All-Union Railroad Transport Scientific Research Institute--an automatic machine for unloading potatoes from railcars, the "MIR-1". This machine was installed at the Dmitrov station and this fall alone it unloaded more than 150 railcars carrying potatoes.

One of the creators of the automatic machine is E. Morozov, laboratory chief in the Loading Operations Department of the All-Union Railroad Transport Scientific Research Institute and candidate of technical sciences. E. Morozov and his colleague, designer M. Pustil'nikov, have come up with an interesting new development--a universal electric loader.

Electric loaders are small, quick machines used to load, unload, cart, and stack and they have long been an integral part of station freight yards, airports, wharves, and warehouses. Almost everything about them is good--they are small, easy to use, and easy to service. Only one thing about them is bad--their storage batteries have to be charged too often.

These mobile electric loaders will run for 3-4 hours and then suddenly stop. They need to be recharged. It takes at least 3 hours to recharge the storage batteries. That is all right as long as the recharger is located right nearby. But what if the place where the loader is in operation is far away from the recharger? This adds to the trouble. Then the mobile electric loader, which is rapidly "losing strength", itself becomes a heavy load, 2 tons of ballast, since it becomes necessary to transport the loader in the bed of a truck to the recharging site. So it turns out that the loader is used productively for only half of a work shift.

But this is only half of the problem. The major problem is a shortage of high quality batteries. Therefore at stations one can often see groups of lifeless, immobile electric loaders that are totally capable of operating.

The scientists E. Morozov and M. Pustil'nikov found a way out of this difficult predicament: they created an essentially "tireless" loader that can operate 24

hours a day. They have called their invention a universal electric loader with a power supply from an alternating current grid (EP-103-UKP).

Like the MIR-1 automatic machine for unloading potatoes, experimental models of the new loaders were tested in Dmitrov. I had the opportunity to observe them in operation there recently.

The mobile electric loader rolls briskly down a long corridor in a vegetable warehouse, holding a container with potatoes on outstretched metal "hands". Externally, the loader resembles its battery-powered cousin. Only one feature distinguishes the two--the new model has a power cable unit. Incidentally, the design of the universal loader allows for the use of storage batteries if the conditions so require.

The first impression is that the machine is on a tether that limits its maneuverability. It seems that the cable does not permit the mobile electric loader to go any significant distance, turn around, or move to the right or left. But this impression is wrong. The electric loader easily handles these apparent limitations. The cable never drops down to the level of the wheels and it does not get wrapped up around the body of the machine. It is always up on top on the rod designed to hold it. It is more difficult for an emotional singer on the concert stage to handle a microphone cord, since he is always getting it wound up in his legs. The performer has to untangle himself from the cord and step around it. But with the loader, everything is simple: no matter where the mobile electric loader turns, the holding rod turns in that direction and the cable cannot possibly get twisted. The cable holder easily turns a full 360 degrees.

E. Morozov, one of the machine's creators, said, "The power source of the electric loader is a three-phase alternating current grid. In place of the storage batteries, a cable-holding device has been installed. It operates according to the principle of a tape measure: the cable is pulled out and a spring is compressed and when then tension on the cable is released, the spring brings it back into the drum."

"What is the maximum length of this 'leash'?"

"The drum contains 20 meters of cable. Additional cable up to 120 meters can be installed to increase the loader's range."

"Erik Nikolayevich, what would happen if too much tension was put on the cable and it snapped? Wouldn't that be dangerous for those working nearby?"

"Two turns before reaching the maximum length, the tension in the drum automatically turns it off. In addition to this, there are two more automatic control devices that ensure the safe operation of the mobile electric loader. So there are no risks involved."

There are many advantages to using this equipment. The electric loader is always ready. It can process about 90 tons of freight per shift. Using electric loaders in arctic regions is no longer a problem; under such cold

conditions storage batteries did not last long. Finally, there is no longer a need to maintain stations for recharging the batteries.

Using a forked grip, a driver fastened something like a "claw" to the hoisting frame to move barrels and then he fastened on a magnetic grip. The electric loader obediently and tirelessly carried out all the commands, easily handling loads weighing up to 1000 kilograms.

Railroad workers and specialists in other sectors of industry, having heard about the invention developed at the All-Union Railroad Transport Scientific Research Institute, inundated the institute with requests for blueprints of the innovation. Requests have come from sailors, postal workers, aviation workers, and agricultural workers. Foreign firms have also expressed interest in the invention.

So far, the institute's experimental plant has put together 15 machines of this type; this is all that the possibilities allow. These tireless helpers are working at freight yards in Moscow, Dnepropetrovsk, Sverdlovsk, and Klin, making work easier for people and surprising and giving joy to those who know the true value of discoveries.

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## RAIL SYSTEMS

### MINISTRY ACTS TO CURB OPERATIONAL SAFETY VIOLATIONS

Moscow SOTSIALISTICHESKAYA INDUSTRIYA in Russian 14 Dec 83 p 2

/Follow-up on newspaper's 27 September, 1983, article: "Derailment"/

/Text/ "Derailment" was the title of a courtroom sketch published in SOTSIALISTICHESKAYA INDUSTRIYA on 27 September. It analyzed serious shortcomings in ensuring traffic safety in rail transportation.

B. Nikiforov, Deputy Minister of Railways, has informed the editors that a special commission of the ministry has investigated and determined the reasons for the collision of trains. Fundamental shortcomings were discovered in the work of the command and instructional staff of the Bryansk Motor Coach Locomotive Depot, the Bryansk Division and the locomotive service of the Moscow Railroad. A number of executives have received severe administrative penalties.

The Ministry of Railways' executive staff has ordered the railroads' executives to discuss the courtroom sketch widely at production meetings and in worker collectives, and to take the specific steps necessary at each and every enterprise, in every shop and in every brigade.

The ministry is giving special attention to monitoring the quality of locomotive brigades' preparedness for each upcoming run.

An answer has also been received from the Bryansk Oblast CPSU Committee, signed by the oblast committee's secretary A. Voystrochenko. It states, in part:

On the Bryansk Division of the Moscow Railroad, 3,238 volunteer traffic-safety inspectors have been taken on; in 1983 they uncovered many different violations. All enterprises and stations have been subjected to careful technical inspection. Practical steps are being taken on the basis of the results.

In order to enhance the knowledge of employees connected with traffic, in all enterprises and at all stations technical training has been organized with the use of trainers and operating charts, models and other visual aids.



For failing to hold locomotive brigades to sufficiently high standards, relaxing supervision of their work, and flagrantly violating the established procedures for organizing the work of locomotive brigades and the requirements contained in instructions regarding the sending of locomotives and motor coaches for repairs, N. Kushnerov, deputy director of Bryansk Depot No. 1, and V. Pankrashov, and engineer-instructor, have been demoted; severe reprimands have been issued to A. Plakhov, chief of the locomotive department, and N. Abramov, director of the Bryansk Locomotive Depot No. 1; and other employees have also been punished.

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## RAIL SYSTEMS

### RAILWAYS OPERATIONS, PERFORMANCE STATISTICAL REVIEW FOR 1983

Moscow GUDOK in Russian 31 Jan 84 pp 1-2

[Article based on the materials of the MPS [Ministry of Railways] Statistical and Performance Administration: "New Important Goals Ahead; Overview of Railroad Transport Operation in 1983"]

[Text] In accordance with the decisions of the November 1982 CPSU Central Committee plenum, a great amount of organizational and educational work was carried out in the railway industry. This work was aimed at maximizing the use of the industry's internal reserves, at increasing the level of organization and responsibility and at the greatest possible strengthening of planning, production technology and labor discipline. The efforts of the industry's agencies, of party, trade union and Komsomol organizations and of all railway workers produced a positive movement in the operation of rail transport and a successful completion of 1983.

The annual plan for total shipments was fulfilled ahead of schedule, on 25 December. The plan was exceeded by 63.6 million tons. An increase of 125.2 million tons over 1982 was achieved. This made up for shortfalls in the two previous years of the five-year plan. Plan targets were exceeded for 37 of 42 types of freight in the plan, including 15 of 17 freights on the annual products list.

Compared to the previous year, coal shipments increased by 8.2 million tons, oil and petroleum products shipments by 5.3 million tons, ore shipments by 10.3 million tons, ferrous metals shipments by 8.8 million tons, chemical and mineral fertilizer shipments by 13 million tons and chemicals and soda shipments by 2.7 million tons. Shipments of agricultural and food products and manufactured consumer goods increased significantly.

Shipments of timber products increased by 8.5 million tons and of cement by 3.7 million tons, although these were short of plan by 9.4 and 2 percent, respectively. Delays in timber product shipments were allowed on the October [Leningrad] Line, which was 2.2 million tons short. Other shortfalls in these shipments were on the Gorkiy Line, 1.7 million tons; the Northern Line, 3.4 million tons; the Sverdlovsk Line, 2.8 million tons; the Krasnoyarsk Line,

1.4 million tons and the East Siberian Line, 2.3 million tons. Of the total shortfall in cement shipments, the October and Alma-Ata Lines were short by 400,000 tons each. The Dnepr and Donetsk Lines were 300,000 tons short. The Sverdlovsk and Baltic Lines were around 200,000 tons short. All 32 railway lines fulfilled their overall shipment plans for 1983, meeting their socialist responsibility in this regard.

While the overall plan was fulfilled, the most qualitative indicator was the fulfillment of the annual products list freight plan by the Donetsk, Odessa, North Caucasus and Baltic lines. At the same time, a number of lines, including the Volga, West Siberian, Transbaykal, October and South Ural, fulfilled their task by hauling freight not on the annual products list.

Average daily unloadings for the system as a whole increased by 3.2 percent, with a majority of railway lines showing an increase. Sixteen lines fulfilled their plan. On a number of lines where there was a significant surplus of local goods, shipments and unloadings were at a low level, particularly on the Central Asian, Volga, October, South Ural, Alma-Ata and Far Eastern lines. These and several other lines did not do the necessary work to reduce rail car demurrage on sidings or to widely implement the experience of the industrial and transportation enterprises of the Lvov Oblast.

In the past year, the use of freight car weight and volume capacity improved. Static loads increased by 90 kg compared to planned levels. This permitted the hauling of 6.5 million tons of products without adding additional cars.

The static load for most bulk freights increased. For instance, it increased by 0.81 tons for oil and petroleum products, by 0.64 tons for ferrous metals, by 0.42 tons for industrial raw materials and molding materials and by 0.21 tons for nonferrous and sulfur ores. It decreased for the transport of shales, mixed feeds, grain and some other freights.

Exchange of rolling stock for the entire system increased by 10,300 cars per day. Car processing noticeably increased on the Kemerovo, Krasnoyarsk, East Siberian, Far Eastern and several other lines. However, due to the large surpluses of goods to be shipped, the Kazakhstan, Volga, Central Asian, October, and North Caucasus lines were unsatisfactory exchange of loaded rolling stock.

For the entire system, 94 percent of passenger trains were on time, an increase of 0.3 percent. For freight trains the figures were 69.6 and 2.2 percent, respectively. The Alma-Ata, Transcaucasus, Volga, South Ural, West Siberia, North Caucasus, Kuybyshev, Azerbaijan and Southeastern lines did poorly in meeting schedules.

Turnaround time--an artificial indicator of freight car use--was accelerated by 7.4 hours. Over 90 percent of this time was gained by reducing demurrage. As such, the average loading time was reduced by 2.7 hours. The average servicing time was reduced by 4 hours.

Freight train track speed increased for the entire system and on 22 lines by 0.4 km per hour. The greatest increase was on the Odessa, Tselina and Far Eastern lines, and on Ural and Siberian lines (except the West Siberian). Track speed decreased by 2.6 km per hour on the Central Asian line, by 1.7 km per hour on the Southeastern, by 0.7 km per hour on the West Kazakhstan and Volga and by 0.5 km per hour on the Transcaucasus.

The average daily freight car productivity rose by 377 net ton-kilometers over 1982.

System-wide and on 23 lines, empty freight car traffic was reduced. However, on the Azerbaijan and West Kazakhstan lines it rose by 2.1 percent, on the Alma-Ata by 0.9 percent and on the Central Asian by 0.4 percent.

The average train gross weight was 2,870 tons, 3 tons over the plan and 31 tons over the 1982 level.

However, not all lines or departments took full advantage of the possibility of increasing train weight and length. Twelve lines did not meet their assigned goals in this area, including the Azerbaijan, Southeastern, North Caucasus, East Siberian, Transbaykal and Alma-Ata lines.

Locomotive productivity for all types of hauling increased by 14,000 gross ton-km. Fifteen lines fulfilled their plan. In contrast, locomotive productivity decreased on the Volga, Southeastern, West Caucasus, Alma-Ata, Central Asian and a number of other lines.

For the Ministry of Railways as a whole in 1983, including the Baykal-Amur Main Line, capital investment was 4.9 billion rubles, or 1.8 percent greater than planned. However, funds designated for the improvement of the existing rail system were not fully used (97.6 percent).

Construction of the Baykal-Amur Main Line continued at a fast pace. Here, investment was 41 percent over the planned limit.

The construction program was implemented at a higher level than last year (including the Baykal-Amur Main Line, 3.9 percent over plan). However, there was a shortfall of 70 million rubles in the annual limit for the existing system. This includes a 56.1 million-ruble shortfall by trusts of the Ministry of Transport Construction and a shortfall of 15.4 million rubles by organizations of other ministries and departments. The Ministry of Railways organizations overfulfilled their plan.

The railway construction organizations overfulfilled their plan for general-contracted work by 0.5 percent and for work done by their own personnel by 0.4 percent. Funds for housing construction and social and service facilities construction were realized at a level of 5.4 percent over plan.

However, about one-third of the railway construction trusts did not meet their plan. These include the trusts of the Gorkiy, Moldavian, Lvov, Kuybyshev, West Siberian, Alma-Ata and Transbaykal lines.

In the past year, the length of electrified railways increased by 1,094 km, for a total of 46,800 km. This is 32.6 percent of the rail system's working length.

The length of the rail system increased by 260 km, due to the addition of new lines. Much work was done to build, develop and reconstruct marshalling yards, and to lengthen station tracks.

Automatic blocking and centralized traffic control were installed on 2,194 km of track, or 4.6 percent over plan. A total of 1,943 km of intercity cable was laid, or 5.7 percent over plan. Electric centralized switching equipment installations were 1.5 percent over plan.

The housing construction plan was overfulfilled by 58,000 square meters, or by 4.1 percent. However, Ministry of Transport Construction organizations were 23,000 square meters short in this area. The Gorkiy, West Kazakhstan, West Siberian and Kemerovo lines also had shortfalls.

In 1983, 1,900 km of track was placed on heavy ballast. The total length of welded track increased by 4,700 km. Reinforced concrete ties were placed under nearly 4,600 km of track. Capital repairs were made on 10,900 km of track (1.9 percent over plan), intermediate repairs on 14,700 km of track (3.2 percent over plan) and raising repair was done on about 23,000 km of track (1.6 percent over plan). All of this allowed unscheduled speed-reduction warnings to be reduced by 15.9 percent.

The plan to supply new electric locomotives to the railway industry was overfulfilled by 0.6 percent, while supplying of main line locomotives was 99.8 percent of plan. The delivery of switching engines was 0.4 percent over plan. The delivery of freight cars was 98.2 percent of plan, while passenger car deliveries were 91.4 percent of plan and container deliveries were 72.2 percent of plan.

The volume of goods produced by the industrial enterprises of the Ministry of Railways totaled about 2.282 billion rubles, 1.6 percent more than planned. Plants of the TsTVR [Main Administration for the Repair of Rolling Stock and the Production of Spare Parts) produced goods worth 1.171 billion rubles, 1.1 percent over plan. Plants of the Main Signalization and Communication Administration and the enterprises of the railway lines fulfilled their plans. Three TsTVR plants did not meet their plans, including the Roslavl Car Repair Plant, which was 1.3 million rubles short, and the Alma-Ata Car Repair Plant, which had a shortfall of around 300,000 rubles.

The locomotive repair plan was not met because of the Tashkent and Orenburg plants. The plan for electrical section repair was not met because of the

Krasnoyarsk plant. The shortfall in the refrigerator car repair plan was due to the Voronezh plant. Production of some of the most important types of equipment was lagging: switches, car retarders, auxiliary electrical equipment for locomotives, wheel pairs and diesel cylinder sleeves.

Glavpromzheldortrans [Main Railway Transport Industry] associations overfulfilled their 1983 plan for shipments by 3.5 percent and their plan for freight handling by 1.7 percent. Only the Volgograd Association fell behind in this category. The Ukraine Association fell behind in loading and unloading work.

Freight car demurrage was 0.85 hours greater than plan, totaling 12 hours. Enterprises of the Sverdlovsk Association made unsatisfactory use of their freight cars the entire year. Their rail car demurrage was 2.43 hours above the norm, while the Volgograd Association was 2.17 hours above, and the Groznyy Association was 2.68 hours above the norm.

The main subway administration fulfilled its passenger hauling plan early, on 27 December. The collectives of all subways met their plans. Ridership increased by 42.1 million, or 1 percent.

The implementation of economy measures for labor, materials and fuels saved 3.4 million rubles of operating resources in the past year. The cost of shipments was lowered by 2.6 percent. The labor productivity task was overfulfilled by 3.5 percent.

In 1983 the railway sector overfulfilled its shipping personnel productivity plan for the first time since the beginning of the 11th Five-Year Plan. That indicator increased by 3.9 percent, compared to a planned increase of 2.1 percent. All rail lines, except the Volga, West Kazakhstan, Alma-Ata and the Far Eastern, fulfilled this task. The Moscow, North Caucasus, Gorkiy, Southeastern, Azerbaijan and Lvov lines made the most significant contributions.

The increase in the volume of work was achieved by raising worker productivity on 17 lines and for the system as a whole. The Kemerovo line achieved only 79 percent of this indicator, the Krasnoyarsk, 76 percent and the East Siberian, 73 percent.

The average monthly salary of a shipping worker was 206 rubles, an increase of 1.8 percent. For the entire system and on most lines, except the Far Eastern, Alma-Ata and Transcaucasus, the rate of labor productivity outstripped the rise in salaries.

However, not all problems of the organization of labor have been solved. Overtime increased by 9.5 percent, while idle time remained at the previous level. The Central Asian, Southeastern, South Ural and North Caucasus lines had the most unfavorable increases of overtime.

In the previous year, the locomotive crew work schedule and time-off situation improved somewhat. Though trains with violations of these rules and working time extensions decreased by 10,000, or by 1.6 percent, they remain at a high level.

Railway transport workers, following the decisions of the December 1983 CPSU Central Committee plenum, are striving to consolidate and multiply these achievements, to ensure the absolute fulfillment of tasks and socialist obligations for 1984.

12595

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## RAIL SYSTEMS

### SYSTEM-WIDE ELECTRIFICATION PROGRESS, PLANS FOR 1984

Moscow GUDOK in Russian 25 Nov 83 p 2

[Article by E. Morits, chief engineer of Glavtranselektromontazh: "Those Who Are Electrifying the Railroads Are Gathering Speed"]

[Text] The rates of electrifying railroads have grown somewhat during the current year compared with previous years. Previously, the commissioning was usually planned for the fourth quarter -- primarily in December. Today, it has been planned for the first time to fulfill more than half of the annual plan in the third quarter. In fact, 484 kilometers were shifted to electrical traction in September. This permitted about 10,000 tons of diesel fuel to be saved. It is especially necessary to talk about the Transbaykal section which is connected with the Far East Railroad. It was very difficult here for the builders and assemblers. It poured rain all summer. Nevertheless, however, the work went on swimmingly. A staff, which included the directors of the trusts and subunits, was organized. The following directed the staff: V. Volobuyev from the general contractor and V. Mun'kin from the Transbaykal Railroad administration. It is necessary to mention that such harmony and such coordination in the customer-general contractor-assembler chain was not always achieved in other places.

Not a single "window" was wrecked during all the time. They developed on the Transbaykal Railroad a technique for moving twin trains. As A. Davgyallo, first deputy chief of the railroad, has pointed out, there were at first enemies of this way of organizing train movement. However, everyone was subsequently convinced that it was possible to operate successfully on the Transbaykal only in this way: Let the paired trains pass and the builders and assemblers could work in the sliding "windows".

This is what they did. The builders and assemblers naturally replied with reciprocity -- organized work in the "window". If an error occurred at times, they immediately talked it over in the staff.

Socialist competition was well organized. Results were summed up monthly and a temporary banner, which was especially established by the Amurskiy CPSU obkom, was awarded to the progressive subunit. Pennants were also awarded to the best section and best brigade of the general contractor and subcontractors. Here is the result: The first freight train powered by electricity travelled from Zavitaya Station to Khabarovsk on 26 September 1983.



The staff on the Transbaykal Railroad is continuing its work. Before the end of the year, it must shift to electrical power another 119 kilometers of the Zavitaya-Belogorsk section. The builders and customer burn with the desire to commission it in November; however, unfortunately, the "Dal'elektroset'stroy" Trust of the Ministry of Power and Electrification is making its own adjustments. It is building the LEP-220 kw for the Zavitaya and Belogorsk power substations greatly behind schedule. The promises to complete the work in October were empty words.

In speaking about the work of Ministry of Power and Electrification organizations in the construction of the incoming transmission lines for the power substations, it is necessary to mention that their attitude toward these installations is chilly. Thus, the Tyumen-Vagay section with a length of 136 kilometers was not put into permanent operation in September because of the absence of incoming transmission lines for the fourth power substation. The promise to complete the work in October was also not fulfilled. There were errors also in other places. I would like the Ministry of Power and Electrification to take these installations under its control in the future.

At the same time, the electrical workers are working successfully on the Odessa Railroad. They have insured the commissioning of the Dolinskaya-Pomoshnaya section -- 144.4 kilometers -- in September. The "Odesstransstroy" Trust is the general contractor there. The installation of the contact system and power substations is being carried out by the forces of EMP-707 in the "Transelektromontazh" Trust. This trust's EMP-702 installers literally were able to put into operation a 104-kilometer section from Baranoviche to Bereza-Kartuskaya on the Belorussian railroad "by storm" during the pre-construction start days.

On the whole, the "Transelektromontazh" Trust collective is working successfully this year. Based on third quarter results, it has been awarded the temporary Red Banner of the Ministry of Transport Construction and the Central Committee Railroad Transport and Transport Construction Workers' Trade Union.

Side by side with the definite successes this year, serious tasks face the electrical workers. It is necessary to carry out the socialist obligations, which have been adopted, and to put into operation everything that has been planned.

Important tasks have been assigned for 1984. It is necessary to electrify approximately 1,100 kilometers of railroad lines, including such a high freight density traffic and important route as the Vagay-Nazyvayevskaya--271.4 kilometers. Then, the electrification of another route, which connects the country's center and the Urals with the rayons of Siberia and the Far East, will be completed.

The electrification of the Agryz-Yudino section -- 234 kilometers--will allow through traffic of electric locomotives on the Kazan-Druzhinino-Sverdlovsk

section, that is, it will connect the Volga area with the Urals. The Karymskaya-Shilka and Belogorsk-Shimanovskaya sections on the Far East route and others will be shifted to electrical power.

The situation on these projects, which got under way this year, requires that urgent measures be taken to accelerate the work. Here, plans are being fulfilled with a significant lag. There is a danger that the brigades installing the contact system will not insure a work front in December and the first quarter of next year. Priority complexes have still not been approved and the standards and design specifications and estimates have not been completed everywhere. Their development for projects in the Kazanskiy railroad center are especially behind.

And last. During 1984, it is necessary to coordinate the volume and periods for fulfilling the work by the USSR Ministry of Power and Electrification organizations in building LEP for power substations considering the commissioning of the sections.

8802

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## RAIL SYSTEMS

### PROGRESS ON SURGUT-URENGOY LINE CONSTRUCTION

Moscow STROITEL'NAYA GAZETA in Russian 13 Nov 83 p 1

[Article by V. Zhilyakov, TASS correspondent, Tyumen: "The Road to Treasures"]

[Text] The speed of delivering freight on the leading 200-kilometer section of the Surgut-Urengoy Railroad has grown. Here, the construction of the linear part of the railroad was completed between Ult-Yagun and Noyabrskaya Station on the eve of Great October.

O. Shaposhnik, chief engineer of the Tyumen'stroypu't' Production Association, says: "When our collective began working on Tyumen soil, no one supposed that the steel track would approach the Arctic Circle after several years-- they planned to lay the rails only to Surgut. However, the rapid development of the new oil and gas deposits introduced adjustments: Last year, the first (work) train arrived in the northern capital of the Tyumen gas drillers -- Novyy Urengoy.

"Temporary operation of the road had begun. We had to complete in a short time the ballasting and finishing of the main road and spur tracks and construct comfortable station settlements and production premises. The entire right-of-way was divided into several underway complexes in order to accelerate the work. The 200-kilometer leading Ult-Yagun/Noyabrskaya section was the first one of them.

"It was from Ult-Yagun that the railroad turned to Urengoy at the very beginning of the last five-year plan. I remember how one of the local hunters, when he saw the rails that had been laid, asked what supported them. It was not surprising; all around were marshes and swamps. In order to lay one kilometer of rails, approximately 100,000 cubic meters of earth were brought in."

One would not know this taiga wilderness now. In Ult-Yagun where more than one and a half thousand people live, comfortable homes, stores, dispensaries, bakeries, and dining halls have been built and a house of culture is operating. The settlement inhabitants watch television broadcasts from Moscow.

The apartments of another settlement on the right-of-way -- Kogalyma -- are well appointed and beautiful. Those, who are building it, were concerned not only about the timely commissioning of the housing and cultural and personal services installations but also about the external finishing of the buildings. A special plan for the external appearance of the microrayons was developed here for this purpose.

The Noyabrskaya Station is becoming a large railroad center with a locomotive depot, railroad car facilities and a great number of auxiliary tracks. Lines, on which it is possible to get to the Sutorminskoye, Kholmogorskoye, Karamovskoye, and Vangapurovskoye oil deposits, fan out from it.

The expansion of their own production base and the use of highly efficient equipment helped to achieve high rates in laying the right-of-way. Previously, for example, piles and spanning plates were brought here from Sverdlovsk, Tselinograd and even Moscow Oblast. Now, their production has been mastered at the site. A modular straightening and finishing operation complex and stations and machines with a program system have replaced the labor of hundreds of workers.

The Siberians call the Surgut-Urengoy right-of-way the road to underground treasures. During this year alone, the temporarily operating section of the road will deliver approximately five million tons of freight which is required for the intensive development of the oil and gas deposits. When the mainline is commissioned for permanent operation, it will become the most important transportation artery in the Western Siberian fuel and energy complex.

8802

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## RAIL SYSTEMS

### CONCERN OVER DETERIORATING TRACK CONDITIONS ON CERTAIN RAILROADS

Moscow GUDOK in Russian 8 Dec 83 p 2

[Article: "Exemplary Maintenance for Rail Facilities"]

[Text] The USSR People's Control Committee has pointed out that the railroad track is being maintained in an unsatisfactory condition on the Moscow, Far East, Kuybyshev, and Odessa Railroads. At the same time, available capabilities for improving the technical condition of the track are not being fully used. Eyewash and the receipt of bonuses, which are illegal in connection with this, have been brought to light in the reports on the volume of repairs and the condition of the track. Cases of squandering ties, rails, rail fastenings, and other material resources have been disclosed.

On the Moscow Railroad, more than 1,400 kilometers or 14 percent of the inspected main track contained serious defects. As a result, the number of warnings about speed limitations increased and significant delays of passenger and freight trains were tolerated. The maintenance of the track in a defective condition leads to a violation of movement safety rules.

This situation is explained by the fact that repairs and current maintenance of the track have been conducted at a low level, the repair duration times have been overstated, and the repair has often been carried out very imperfectly.

Materials for the track's upper structure have been expended negligently on the road. The quotas of the Ministry of Railways for the repair and repeated use of sleepers are regularly not being fulfilled. At the same time, cases of the sale of previously used ties, which are suitable for laying on the track, have been tolerated. This year, more than 190,000 of them were sold to private individuals and foreign organizations. New ties are also often being sold. Thus, in 1981-1982, the Ryazanskiy Tie Impregnation Plant sold 39,000 of these ties to a number of enterprises and organizations.

Comrade Konyushevskiy, the deputy chief of the Moscow Railroad who manages track facility matters, did not take the necessary steps to organize repairs and coordinated poorly the activity of the track subunit directors. That is why many of them -- in violation of their duty obligations -- ceased to personally accept the repaired sections and did not inspect the quality of the

work that had been performed. Going to a division, Comrade Konyushevskiy did not suppress instances of eyewash in evaluating the condition of the track, train movement safety, and squandering of ties and rails.

On the Far East Railroad, the plan for capital repairs to the main track was only fulfilled by 93 percent in 1981-1982. This year, the road has fulfilled the repair plan for the first eight months; however, more than one-fourth of the track was not repaired on the Khabarovskiy branch where the track is in the most defective condition. In the majority of cases, repairs are being performed with violations of technology, incompletely and with low quality. During upgrading repairs, the replacement of rotten ties often did not take place; on some tracks that were considered repaired, no more than 30 percent of the supposed work had been performed; and on individual sections, it had not been performed at all. All told, it was revealed that 22.4 of the road's kilometers, which had been shown in the report, had not actually been repaired. The repair plan for old wooden ties is regularly not being fulfilled. During the first eight months, 28,000 ties were repaired when the annual plan called for 160,000.

The necessary accounting of the availability and expenditures of materials for the upper structure of the track has not been organized in all inspected track divisions and track machine stations. This has created conditions for squandering ties, rails and rail fastenings. During 1982 and the first eight months of this year, more than 150,000 wooden ties, which were suitable for laying on the track without repair or after it, were sold to foreign organizations at a time when 1.1 million ties requiring replacement lay on the track.

The shortcomings in track maintenance on the Far East Railroad became possible because Comrade Gaponenko, the deputy chief of the road who manages track facility matters, did not take steps to strengthen control over the quality of track repairs. This engendered irresponsibility and led to the concealment of shortcomings and the coloring of the actual situation.

Violations in the maintenance of track facilities, the use of material resources and financial and planning discipline were also revealed on the Kuybyshev and Odessa Railroads.

For the tolerated shortcomings in organizing the repair and maintenance of track facilities, the eyewash in the reports on the technical condition of the track and the concealment of cases of violations of movement safety rules and of an irresponsible attitude toward the use of materials for the upper structure of the track, the USSR People's Control Committee reprimanded V. Konyushevskiy, the deputy chief of the Moscow Road, and V. Gaponenko, the deputy chief of the Far East road.

B. Morozov, the deputy minister of railways and chief of the Ministry of Railways Main Track Administration, was reproved for the tolerated serious shortcomings in the management of track facilities.

The Ministry of Railways has planned specific measures to eliminate the revealed shortcomings in connection with the People's Control Committee decree.

The Ministry of Railways reprimanded V. Butakov, the deputy chief of the Main Track Administration, for the failure to take steps to reveal in a timely fashion the additions which misrepresented the data on the condition of the track on the Moscow, Far East, Odessa, and Kuybyshev Railroads.

8802

CSO: 1829/132

## RAIL SYSTEMS

### PROGRESS IN PROLIFERATING AUTOMATED CONTROL SYSTEMS

Moscow GUDOK in Russian 27 Oct 83 p 2

[Article: "Automating Operational Control of Shipments"]

[Text] Operations are being conducted in railroad transport for creating a sector automated control system [ASUZHT] intended in the first place for improving operational control of the shipping process. The experience of the Belorussian Railroad is taken as a basis in this case where an automated system, which makes it possible to control the train and freight operations of stations, departments and the railroads as a whole, was developed and is functioning. On the basis of machine processing of given primary accounting documents, the railroad computer center provides operational workers with necessary information concerning the status of the shipping process and the prognosis for the approach of rail cars and freight, and it issues technical documents.

Standard technical specifications for creating automated railroad systems were developed by using the experience of the Belorussian Railroad. The first section of this system is being put in operation on the Northern, October (Leningrad), South Urals, East Siberian, Transbaykal and Far Eastern Railroads. Training is being implemented as well on the Baltic, Lvov, Southwestern, Moscow, Gorkiy, Sverdlovsk, West Siberian, Kemerovo, Krasnoyarsk and a number of other railroads. The volume of operations being performed by means of EVM [computers] is increasing by 15 to 18 percent annually, and the number of tasks being resolved for improving the operational control of shipments is growing.

Computers are being used on six railroads for operational control in distributing and operating locomotives. The calculation of rail car flows, the train marshalling plan and monthly shipment routing plans is being done, and machine compilation of train movement schedules was begun. Automated control systems, which made it possible to improve station operating indicators and labor conditions for workers of the mass occupations, are functioning at 35 marshalling yards.

In addition, for the time being automated control systems are not exerting the proper influence on fulfilling the shipment plan and improving the utilization of rolling stock. The main administration for computer technology and



railroad managers are not taking energetic measures for disseminating the experience of the Belorussian Railroad. Automated systems are being developed by small groups, and because of this the periods of time for putting them in operation are being prolonged. The main administration for computer technology is tolerating double counting in assembling operational data on freight operations and rail car inventories.

The All-Union Scientific and Research Institute of Railroad Transportation and the VUZ's are not providing in full measure for the creation of scientific work in progress to develop automated control systems, and in particular systematic developments for the automation of forecasting and operational planning of train and freight operations.

Automated systems created for operational control are operating only in an information and reference mode, and the tasks of forecasting and planning the shipment process are being resolved only on the Belorussian and South Urals Railroads.

The main administrations of computer technology, signalling and communications are not sufficiently developing the network of communications channels. The construction of computer centers on the North Caucasus, West Siberian, and Central Asian Railroads is being conducted unsatisfactorily. Effective measures are not being taken to strengthen the material and technical base of computer technology organizations. The directors of railroads and departments are not managing operations for creating and efficiently using automated systems.

The minister issued order number 24Ts, which in the next few years envisions putting in operation automated systems for operational control of the shipping process on all railroads and at marshalling yards; utilizing minicomputers and microcomputers; developing information communications and networks for transmitting data; and building computer centers, with the aim of radically improving the utilization of operating ones and accelerating the assimilation of automated control systems just being created, as well as providing immediate utilization of them.

The order defines the plan for putting in operation automated systems and combinations of tasks for controlling shipments, and it establishes the assignments for conducting scientific-research and planning-designing operations in automating control of the shipping process during the 1983-1987 period.

9889

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## RAIL SYSTEMS

### ELECTRIFICATION OF 115-KM ZAVITAYA-BELOGORSK LINE COMPLETED

Moscow GUDOK in Russian 30 Dec 83 p 3

[Article by GUDOK correspondent in Belogorsk: "The Green Light for Electric Locomotives"]

[Text] On 29 December, a meeting dedicated to the commissioning of the electrified section of the 115-kilometer Zavitaya-Belogorsk line took place in the area of the Belogorsk train station. G. Vidyakin, chief of the Transbaykal Railroad, congratulated the builders and electrical workers on the labor victory.

And then the electric locomotive under the control of engineer V. Mal'kov and his assistant A. Motyash took the first train in the direction of Zavitaya.

On 27 September of this year, the first section, Arkhara-Zavitaya, was turned over ahead of schedule as well. So then this is the second labor victory.

It wasn't easily obtained. Disregarding time and fatigue, and the freezing weather and burning wind, the builders installed trestles and stretched the contact wire. Young military builders such as Privates I. Okhlopkov, A. Ubavichus and Zh. Zhumusov bore the main brunt. The railroad chief gave incentives to many people and he awarded a bonus of color television sets to the personnel of two subunits [podrazdeleniye].

Comrade Volov's administration, the EMP-708 and SMP-823 electrical installers of the "Transelektromontazh" trust and the "Tyndatransstroy" builders, who turned over a dwelling of excellent quality by the deadline, worked well.

Literally before the last days, a delay in laying the power transmission lines to the Zavitaya and Belogorsk railway substations aroused some anxiety. On 23 December current was provided to the Zavitaya substation. The selfless labor of the collectives of three trains belonging to the "Transelektromontazh" trust under the leadership of the chief engineer of the Belogorsk railway substation and the contact network at the Yekaterinoslavka-Troyebratka span and the Belogorsk-2 station.

The electrification staff under the leadership of V. Mun'kin, the Transbaykal Railroad deputy chief for construction, played a leading role in organizing construction operations and installing equipment. The Amursk obkom of the CPSU assisted in enlisting the efforts of all construction participants in fulfilling the state task.

The transportation workers provided a timely allocation of "windows" to the builders without loss in operational work. The railway engineers and the station workers themselves did a lot for developing the Belogorsk station.

The construction project will also be memorable for workers with the Far Eastern and East Siberian main lines who were sent on detached duty for installing and setting up the equipment. The close cooperation of everyone involved in the matter brought success.

9889

CSO: 1829/121

## RAIL SYSTEMS

### 'TRANSPORT' UNIFIED RADIOCOMMUNICATIONS SYSTEM FOR USSR RAILWAYS

Moscow GUDOK in Russian 14 Dec 83 p 2

[Article by N. Dotsenko, radiocommunications department chief of the Main Administration of Signalling and Communications: "Radiocommunications and Transport--Prospects for Developing an Important Economy"]

[Text] Almost immediately following the war, radiocommunications were begun to be used on the country's railroads in train and station operations. Since 1948, they have been building the radio nets of the switching dispatcher and the depot and shunting assistants with switching and shunting locomotives. This made it possible to accelerate processing of rolling stock at the stations. Since 1949, train radiocommunications have been used on railroads to facilitate an increase in the section speed and travel safety of trains. Then radio sets showed up with rail car schedulers and workers repairing tracks and electrification, STsB [signalization, centralization and blocking] and communications equipment, and at other subunits [podrazdeleniye] of the railroads. And now, probably, not a single service can manage without a radio set.

By the beginning of the 10th Five-Year Plan, there were tens of thousands of radio stations on the railroads. During subsequent years, deliveries of them increased sharply. And although annually a very substantial portion of the new equipment was spent on replacing obsolete gear, now hundreds of thousands of radio sets, whose services nearly 800,000 transport workers are making use of, are already being operated on train, station and other networks. Repair and control points were created at the railway signalization and communications divisions, radiocommunications brigades at the railroad laboratories, and radiocommunications departments staffed with highly skilled specialists in the services. This entire contingent is involved in servicing radio equipment.

The new train radio sets have more frequencies and better parameters which make it possible to maintain more stable communications, and the portable ones have been reduced in weight and their operational reliability has increased.

However, technical progress is making even greater demands on radiocommunications operations. It was precisely for this reason that it was decided to start creating "Transport"--a unified system of radiocommunications facilities.

This development is being conducted by using the latest achievements of native and foreign science and technology: by using integrated microcircuits, micro-assemblies, microprocessors and leading technology. According to the basic technical and operational parameters--functional possibilities, number of channels, temperature range and others--the "Transport" system surpasses or is on the level of communications facilities of the leading technically developed countries of the world.

The following radiocommunications systems are being created on the basis of the "Transport" complex:

/Train/ [in boldface] radiocommunications counted on for joint operation with an existing system of the same designation, but in contrast to it eliminating interference which occurs in junctions where several routes intersect. Moreover, it provides communications for the locomotive engineer with repair subunits located on a span between stations, assistant station masters and protected crossings, and oncoming trains. These radiocommunications are used also for telecontrol of locomotives.

/Decimetric range train radiocommunications/ [in boldface] with selective calling of locomotives. It is intended for organizing a high-quality communications channel for train, locomotive and power supply dispatchers with locomotive engineers on sections with high-speed train traffic and on heavy freight traffic routes. The possibility is envisioned for it as well to transmit telecontrol signals to the locomotive.

/Repair and operational radiocommunications/ [in boldface] intended for maintaining supervisory contact of track signalization and communications divisions and power supply sections with appropriate subunits working at stations and spans between stations. And the supervisors of these subunits will be able to establish communications by radio with the locomotive engineers, DSP [duty switchman] and DNTs [centralization section chief].

/Radiocommunications of the passenger train brigade leader/ [in boldface] with ticket office duty persons provides timely transmittal of data concerning vacant seats as well as other information.

As you see, the comprehensive "Transport" system covers practically all railroad activities with radiocommunications. And it will be based on modern equipment. The facilities recommended for the "Transport" system have wide ranges of application. At the same time, they will be specially equipped for operating in various railroad subunits. Thus, it is envisioned in line repair communications that dispatchers supervising the elimination of track problems of communications and power transmission lines will have the means to communicate with any repair group moving toward the trouble spot in a motor vehicle or on a hand car.

But in order to obtain the maximum output from the new system it is necessary now as rapidly as possible during the assimilation period to get rid of our existing technical and organizational shortcomings. And in a number of cases and on the whole to organize the work in a new manner.

First of all, it is necessary to replace the vacuum-tube radio sets with new ones, since they worsen the quality of communications and servicing them becomes more difficult each year. And subsequently, while taking our cue in the near term from the considerable increase in the number of radio sets now being operated on railroads, we should be constantly involved in strengthening the bases of technical maintenance of radiocommunications facilities and production and line sections.

While technically reequipping railroad radiocommunications in phases, we should complete development and organize production of the "Transport" radio facilities complex in the established time limit.

But however strange it is, nowadays too there are commanders of various ranks and professions who at times brush aside radiocommunications facilities. They don't want to take them on the balance sheet so as not to bear material responsibility, and also they don't want the other concerns connected with operating this equipment.

On the other hand, there are also communications workers who say: "Why give them more and more new radiocommunications equipment? Then we'll just have to repair it."

We should deal resolutely with both those and other attitudes.

After having accepted beforehand the radio sets received on one's own balance sheet, coordinated them with the operational processing method, determined personal responsibility for utilization and safekeeping, and--the main thing--resolved the matter of technical servicing of the radio set, it is necessary to authorize putting the equipment in operation by order of the enterprise manager.

As also accepted in rail transport, signalization and communications divisions perform technical servicing. This kind of servicing of an ever-increasing quantity of radio sets can be guaranteed only in that case when the railway division has specialists and work places for this.

One should think that staff persons and necessary funds for that or some other one can be obtained from the enterprises operating the new equipment. In fact, as a rule, assimilating a radio into any transport subunit's operational processing method leads to resource savings and a release of manpower.

It is only necessary to put the radio sets being received in operation more boldly and more rapidly, and not merely to adapt them to the existing processing method, but if this is expedient then adapt it.

The matter of strengthening or creating bases for technical servicing of STsB and communications equipment is not new, and it is adequately expounded upon in order 24Ts concerning assimilation of the industrial method. All decisions stipulated in it in the part on creating repair, production and line sections, and production and living areas completely suit radiocommunications.

We are faced with resolving a whole series of matters connected with assimilating the new facilities of the "Transport" system. This pertains to planning, financing project planning, building and operating, and material and technical maintenance of cables, spare parts and measuring equipment. The experience of previous years will be used here, but a lot will have to be resolved once again.

Up to now the chief directorate of signalization and communications resolved all matters of technical progress for radio. Now such a period has come when we should considerably increase the role also of those who use radiocommunications. They must see that they not only provide maximum output, but also must be concerned about their proper operation, maintenance and technical condition.

Our institutes--VNIIZhT [All-Union Scientific Research Institute of Railroad Transportation], TsNIITEI [Central Scientific Research Institute of Information and Technical and Economic Research] and indeed all educational VUZ's--also must occupy a fitting role for them in assimilating the new equipment. Right now only two departments--STsB and communications and economics--at the VNIIZhT are involved in radiocommunications. But for this matter it's also necessary that many other departments of the institute provide recommendations on how better to use radio in those enterprises and transport subunits and the matters in which they are involved. And TsNIITEI could be involved in wide dissemination of leading experience in the use of radiocommunications.

It would be good in the VUZ's to teach not only communications workers how to use radio, but also future transportation workers, railway engineering students and locomotive workers. Speaking to the point, it's absolutely incomprehensible why now, when the development of technical progress requires broader and broader use of radiocommunications in the entire transport economy, VUZ's and tekhnikums have curtailed the output of specialists of this type.

The rapid, broad and proper assimilation of the "Transport" system has enormous importance. Suffice it to say that, as they calculated at the VNIIZhT, by now the annual economic effect from assimilating radiocommunications is approaching 100 million rubles. This is several times more than we spend per year on new radiocommunications facilities. But, in fact, the matter is not only in economic computations. The equipping of all railroad organizations with radiocommunications units and the efficient utilization of them will make it possible to more rapidly resolve the main task of transportation--to completely satisfy the national economy's shipping requirements.

9889

CSO: 1829/121

## RAIL SYSTEMS

### NEW CLEARANCES TO PERMIT LARGER TIMBER LOADS

Moscow GUDOK in Russian 2 Dec 83 p 2

/Article by Yu.-Lazarenko, chief of the clearances sector of the All-Union Research Institute for Rail Transportation: "Zonal Gauge"

/Text Moscow--The Ministry of Railways has taken a decision to put an increased loading gauge into effect for timber carried in gondola cars as of 1 May, 1984. This is the first step in the practical implementation of the results of many years of purposeful work. It was begun back in 1934, when the long-range "2-S" (now "S") obstruction clearance was confirmed; in its dimensions, this obstruction clearance was unprecedented in world practice.

At present, more than 70% of the main track at and between stations fully conforms to the "S" clearance.

The total amount of work to bring buildings and structures into conformity with the new obstruction clearance is such that it will still take a good many years to accomplish this task. Taking this into account and proceeding in light of the acute need to utilize all reserves to raise the railroads' carrying capacity, the Ministry of Railways has decided to institute interim vehicle and loading gauges that will permit maximum use of the clear space provided by the "S" obstruction clearance.

The new loading gauge is being instituted as a supplement to the existing gauge and has two distinctive designations in its name: "increased" and "zonal." The existing loading gauge, beginning at a height of 4,000 mm from the top of the rails, narrows along an inclined line, whereas the increased gauge narrows along a broken line and initially has a steeper angle of elevation. At the first stage, authorization has been granted to load unbaled round timber according to the increased gauge, but only in gondola cars, which is related to ensuring the longitudinal stability of timber on open cars.

Depending on the diameter and length of the round timber, it will be possible to load from three to seven cubic meters more of it in a single gondola car than can be loaded using the existing loading gauge. A car loaded with timber



takes the form almost of a rectangular stack. This makes it possible to readily distinguish, by sight, a load that conforms to the increased gauge from one that conforms to the existing gauge.

The increased gauge's second designation, "zonal," is given in connection with the fact that it has not been extended to the entire rail network but only to a specific zone, albeit a vast one. A number of railroads and sections of track are still not ready for the use of this gauge. Tunnels and viaducts create barriers on them. The Far Eastern, Transcaucasian, Azerbaijan and Lvov Railroads, as well as a number of lines on the North Caucasian Railroad and two terminal sections on the Northern Railroad have been completely excluded from the zone in which the increased gauge is to be in effect. Restrictions will be lifted from them as structures are modified.

The limited sphere in which the increased gauge is to be in effect presents a number of important requirements for ensuring traffic safety. All loading stations and the freight offices and buildings of acceptance and transfer agents must have lists of the railroads and sections that are closed to cars loaded in accordance with the increased gauge. Employees in freight offices must show special attentiveness and thoroughness when drawing up shipping documents. It is mandatory that the notation "zonal gauge" be made on documents pertaining to cars loaded according to the increased gauge.

An additional burden is imposed on employees at stations bordering on sections that are excluded from the zone in which the increased gauge is in effect. They must carefully check shipping documents, visually inspect trains and prevent cars that are loaded according to the increased gauge from getting through. As an additional, insurance measure to prevent cars with increased loads from getting onto the closed sections, the entrances to them are to be protected with the use of clearance-monitoring devices.

The widespread introduction of the increased loading gauge will provide concrete, palpable assistance to transport in fulfilling freight shipping plans.

8756

CSO: 1829/141

## RAIL SYSTEMS

### RAILROADS BLAME EACH OTHER FOR GRAIN SHIPMENT DELAYS

Moscow GUDOK in Russian 13 Nov 83 p 1

Article by GUDOK correspondent L. Turov: "Failure After Failure"

Text Tselinograd--The October plan for grain shipments by the Tselin Railroad was not fulfilled: It was met by only 78% in terms of tonnage and 71% in terms of railroad cars. Things are not going any better in November, either: In the first 10 days of the month the railroad already failed to provide more than 1,000 covered cars.

What are the reasons for such an unenviable state of affairs with respect to grain shipments on the Tselin Railroad? "The whole problem," says A. Moskalenko, deputy chief of the traffic service, "lies with our neighbors' lack of discipline. The Alma-Ata Railroad regularly fails to fulfill assignments for sending us empty cars. The same can be said of the Central Asian Railroad: Instead of the 400 cars per day it is supposed to send us, it sends from 200 to 270, or even fewer. On 3 November, for example, it sent us 102 cars, and on the next day--119 cars. The Tselin Railroad's southern neighbors are also holding up grain cars. They receive 200 of them from the north every day and return from 70 to 80 a day."

In a situation in which literally every empty car counts, it is important to organize their precise distribution. However, the executives of certain divisions are excessively attentive toward some stations and completely indifferent to the needs of others. In the Tselinograd Division, for example, the grain-loading stations located in Turgay Oblast survive on starvation rations. On the other hand, the stations in Tselinograd Oblast overfulfill their plan, if only by a little. One would like to ask Comrade Kasimov, the chief of this division, why scarce empty cars are distributed in such a nonobjective fashion.

Right now the Tselin Railroad has 700 covered cars above the norm. Granted, unloading has clearly been stepped up. In the first nine days of November alone nearly 5,300 cars were freed over and above the technical plan. True, their technical condition leaves something to be desired, and repair requires vast amounts of time, money and materials. But the Tselin Railroad has no other solution but to repair these empty cars and ready them to haul grain.

As for the Alma-Ata and Central Asian Railroads, which have not been fulfilling their control assignments, it is time to finally compel their executives to carry out the ministry's orders.

## RAIL SYSTEMS

### BRIEFS

16,000 TON TRAIN--(In the departments and laboratories of the All Union Scientific Research Institute for Railroad Transportation). Unique research has been conducted at the Shcherbinka station near Moscow under the leadership of V. Inozemtsev, doctor of technical sciences. Operating conditions for freight trains weighing up to 16,500 tons have been tested at an experimental circular track. The tests involved series produced equipment, new automation systems for braking and traction equipment. The results obtained are the basis for scientific recommendations on the organization of freight transportation using trains with increased weight and length. [Text] [Moscow GUDOK in Russian 20 Dec 83 p 2] 11574

NEW MOSCOW TRACK--On 25 December, a year ahead of schedule, a third line on the Moscow - Biryulevo Kashirskiy Division of the Moscow Railroad was opened for train movements. This was preceded by the construction of an entire complex of railroad projects. The Moscow Passenger-Paveletskaya Station was partially rebuilt. The tracks and platforms here were lengthened and some new ones built. A yard for electric trains was built. All platforms on the section were rebuilt with a view to the movement of 12 car electric trains. Two pedestrian tunnels and two overpasses were built and 20 kilometers of overhead contact wire were installed. A number of bridges and overpasses received major repairs. It was possible to complete the work ahead of time because of the joint efforts of builders (the general contractor was the Mostransstroy [Moscow Transportation Construction Trust]), and the Moscow Railroad collective. Last year these units signed a contract on labor cooperation. The third track will markedly increase interurban train traffic. This will markedly improve travel conditions for inhabitants of Moskvoretskiy, Proletarskiy, Sovetskiy, Krasnogvardeyskiy and other rayons of the capital. [By I. Kikoulin] [Text] [Moscow GUDOK in Russian 27 Dec 83 p 2] 11574

NEW LINE--Surgut--The 201 kilometer Surgut - Ult-Yagun - Noyabrskaya line has been put into operation. It required considerable efforts to lay the line as it passes through a region with abundant lakes, swamps and permafrost. Now pipe for gas and petroleum lines, drill rigs, construction and other materials can be delivered more rapidly. This will promote the further development of petroleum and gas deposits. A good job on this line was done by collectives of the Tyumenstroyput Production Construction and Installation Association and subcontracting organizations. They moved tens of millions of cubic meters of earth, built numerous installations, production and cultural-service buildings and residences. [Text] [Moscow GUDOK in Russian 30 Dec 83 p 3] 11574

KAZAN SUBWAY--Researchers have been ordered to survey the future routes for the Kazan metro. The Kazan metro is a component part of the city's transportation system, developed with consideration given to the future prospects for the large industrial and cultural center of 1 million. The subway will have two branches. The first will go diagonally through the city center, linking outlying areas. The other branch will tie residential areas to the old airport and the western industrial zone. The first line will be about nine kilometers long. The survey begins in 1984. [By M. Zaripov] [Text] [Moscow SOVETSKAYA ROSSIYA in Russian 30 Dec 83 p 4] 1574

ELECTRIFIED LINE--Kurort-Borovoye--The electric locomotive's whistle blows. This sound had never been heard here before. Therefore stormy applause greeted the locomotive engineer N. Ivanov and his assistant K. Baymagambetov. Today they were the first ones to traverse the 226 kilometer electrified section from Tselinograd to Kurort-Borovoye. Of course, they were met by flowers, smiles and applause. After giving a speech, N. Ivanov turned it over to those who participated the most in the electrification of this heavy freight traffic section. Thus, another 226 kilometers of line have been converted to electric traction. The level of electrification on the Tselin Railroad is now 31 percent. This considerably increases line capacity and traffic speed. It also releases more than 20 car workers at the Ak-Kul Station technical service point and more than 100 locomotive crews per month. These are preliminary calculations. Electrification is continuing as planned on the Kurort-Borovoye -- Kokchetav -- Utyak line. [By L. Turov] [Excerpts] [Moscow GUDOK in Russian 31 Dec 83 p 3] 11574

ELECTRIFIED SECTION--Kokchetav--Electrification has been completed on the important section of the Tselin Railroad between the stations at Ak-Kul and Borovoye. Yesterday the first trains pulled by electric locomotives hauled Ekibastuz coal on the 120 kilometer route. The electrification of this section alone will increase freight car turnover on the Kokchetav Division by 1 hour. Every day additional freight cars will be released to haul goods. [By TASS] [Text] [Moscow SOTSIALISTICHESKAYA INDUSTRIYA in Russian 6 Jan 84 p 1] 11574

NEW RAIL CARS--Altay Kray--At the end of last year Altay rail car builders completely switched over to the production of all metal cars. The new cars were awarded the state mark of quality. Their technoeconomic characteristics exceed those of their predecessors. By replacing inner linings, inter-repair service life has been increased from 12 to 16 years. The increased door width (it has been doubled) has reduced loading and unloading time and made it possible to use machinery. [By N. Il'ichev] [Text] [Moscow SOTSIALISTICHESKAYA INDUSTRIYA in Russian 18 Jan 84 p 2] 11574

FIRST TRAIN ON WEST BAM SECTION--A 135 kilometer stretch of mainline on the western part of BAM from the Severomuyskiy Range to the village of Taksimo (northern Buryatiya) has been put into temporary operation. A large station is being build in Taksimo. [Text] [Moscow EKONOMICHESKAYA GAZETA in Russian No 3, Jan 84 p 3] 11574

11574 -  
CSO: 1829/148

## MARITIME AND RIVER FLEETS

### BRIEFS

NEW GAS TURBINE SHIP -- A new passenger ship designed to carry 600 passengers has joined the complement of the oil and gas industry's fleet in the republic. The ship, the "Aleksey Kortunov", which was named in honor of the late minister of the enterprises of the USSR Oil and Gas Industry, has gone to work in the eastern Caspian. Excellent conditions have been created for the passengers and crew on the new ship. There is air conditioning, a refrigerator, and a comfortable lounge in which photographs and other documents about the life of Hero of the Soviet Union Aleksey Kirillovich Kortunov are displayed. The ship, built by Finnish shipbuilders, was navigated to the Caspian Sea by the experienced captain and director of "Kaspneftegaz" [Caspian Oil and Gas Fleet], T. Guseynov and senior engineer F. Mustafayev. The powerful engines and excellent navigation system with which the ship is fitted permitted bringing the ship from Helsinki to Baku in a short time under difficult weather conditions. [By VYSHKA correspondent Kh. Aliyev ] [Text] [Baku VYSHKA in Russian 28 Dec 83 p 3] 9136.

CITY, SUBURBAN PASSENGER SHIP -- At the Moscow Shipbuilding and Ship Repair Plant, trial runs were conducted on a class 0 passenger ship on New Year's Eve. The ship is for use on city and suburban passenger lines with passages of up to eight hours in one direction. In technical features, the ship has insulated cabins and an effective heating system. The hull structure allows operating the ship in -12C air temperatures and in drifting ice of 0.2 meters thickness. The two lounges accommodate 150 passengers. [Text] [Moscow VODNYI TRANSPORT in Russian 3 Jan 84 p 4] 9136

NEW RO-RO SHIP -- The new roll-on/roll-off ship, "Yuri Avot", which came to the shores of the Daugava river right after hoisting the state flag of the USSR in Leningrad, truly can consider this day in the port of Riga as its name-day. In their life times how many different ships have the dock workers seen? But on this one their gazes were riveted with special interest. In the first place, many of the port workers remember the man for whom the ship was named. Many times had they seen Yu. K. Avot, communist and chief of the Latvian Steamship Company, on these very same piers and they have the best memories about him. In the second place, there is the ship itself--built by the shipbuilders of Lenin's city--which is unusual in many respects. At the very first loading the people of Riga were convinced of this. The bow ramp had been lowered onto the pier and it opened the eyes of the dock workers to the spacious hold. And, one after another, light motor vehicles for export drove onto the ship. [Excerpt] [Moscow VODNYI TRANSPORT in Russian 5 Jan 84 p 2] 9136

OIL RIG SERVICE SHIP -- The Soviet flag is raised on the first ship to come off the building ways of the Shchetsin Shipyard imeni A. Varskiy this year. To them it is "Neftegaz-6", a multipurpose tug built to USSR order. The ship is for servicing offshore drilling platforms and carrying various cargoes. "Neftegaz-6" also is fitted with the very latest equipment for extinguishing fires and for carrying out rescue operations. In all, Shchetsin shipbuilders will build 33 ships of this type to the Soviet order. These ships will work for the offshore oil industries. [Text] [Moscow VODNYI TRANSPORT in Russian 10 Jan 84 p 1] 9136

NEW MIXED-NAVIGATION SHIP -- The distinct outlines of Krasnoye Sormovo Shipyard's motor ships of the river-and-sea type are familiar not only on the Volga but also on the seas. Having enviable seakeeping qualities, the "sormovskies" successfully navigate on the Black, Baltic, Mediterranean, and other seas. Here, now, more modern ships of this class are coming to replace them. A dry cargo ship for mixed navigation of the new series, "Zhiguli" is being developed at the Krasnoye Sormovo Shipyard. The ship will have a cargo capacity of 5,000 tons. The "Zhiguli" have powerful main engines and modern navigation equipment. They have good speed and maneuverability. In their construction the Krasnoye Sormovo shipbuilders are using the latest achievements of science and technology. [By VODNYI TRANSPORT special correspondent] [Text] [Moscow VODNYI TRANSPORT in Russian 10 Jan 84 p 4] 9136

NEW FRUIT CARRIER -- The first ship of a new series of fruit carriers, the motorship "Kursk" was moored yesterday at a pier in the maritime port of Riga. The ship was built by Polish shipbuilders. The new series of refrigerator ships has advantages over previous ones. Their cargo capacity has been increased by a factor of more than three and their maneuverability is improved. In all, the Polish shipbuilders will deliver seven such fruit carriers to the Latvian Steamship Company. (TASS) Riga. [Text] [Moscow VODNYI TRANSPORT in Russian 12 Jan 84 p 1] 9136

MULTIPURPOSE CARGO SHIP -- The shipbuilders of "Warnow Werf" in Rostok on the Baltic coast of the GDR, this year opened the account of ships built in the GDR for the Soviet Union. The cargo ship "Astrakhan", whose port of registry will be Leningrad, was transferred to the Soviet client. The ship can be used to transport both general and out-sized, and loose cargoes. The 172-meter giant, developed by GDR shipbuilders jointly with Soviet colleagues, can take on board more than 18,000 tons of freight. [Text] [Moscow SOTSIALISTICHESKAYA INDUSTRIYA in Russian 12 Jan 84 p 3] 9136

MULTIPURPOSE CARGO SHIP -- The motorship "Astrakhan" which supplements the fleet of the Baltic Steamship Company combines the capabilities of many types of ships. Yesterday, for the first time, it was moored in its port of registry - Leningrad. This ship is the first of a series of cargo ships being built by GDR shipbuilders to an order of the USSR. The ship is able to carry out at the same time the functions of a container ship and a bulk carrier. It also can operate as a roll-on/roll-off ship. More than 200 light motor vehicles can go independently from the pier into the hold over a special stern ramp. The utilization of this multipurpose ship, following which the country's steamship companies will receive several more similar ones, is especially advisable on long distance shipping lines. (TASS) Leningrad. [Text] [Moscow VODNYI TRANSPORT in Russian 24 Jan 84 p 4] 9136

CSO: 1829/147

## PORTS AND TRANSSHIPMENT CENTERS

### PORT PERFORMANCE WRAP-UP FOR DECEMBER 1983

Moscow VODNYI TRANSPORT in Russian 24 Jan 84 p 1

[Article: "The Level of Coordination Is Higher"]

[Text] The work of transportation centers was strenuous at the end of 1983. Meteorological difficulties had an effect in the Baltic, the Black Sea, and especially in the Maritime area.

With an overall fulfillment of the plan by 103.7 percent, the transport worker collectives of Murmansk, Kandalaksha, Vyborg, Ventspils, Odessa, Kherson, Feodosiya, Belgorod-Dnestrovskiy, Yuzhnyy, Batumi, Makhachkala, Magadan, and Korsakov achieved the best results during the fourth quarter.

The annual plan for loading and unloading operations for the ministry as a whole was fulfilled by 104.1 percent; 1982 results were exceeded by almost a million tons.

The target for transshipping foreign trade goods was fulfilled by 101.8 percent, 1.4 million tons of export cargo was transferred above the target, and the lag for imported goods was 79,700 tons.

The indicators of the Far East transport centers of Vladivostok, Nakhodka and Posyet serve as a graphic example of underestimation of regional coordination. The collegium of the Ministry of Maritime Fleet justifiably criticized the Far East Steamship Company for this during its 27 December meeting. During December, the plan for transferring cargo was fulfilled in Vladivostok by 94.4 percent, in Nakhodka by 104.8 and in Posyet by 115.8 percent. The regulation of vessel and railroad car deliveries to the transportation centers is one of the main functions of regional coordination. If attention is not paid to this question, the negative consequences are expressed in the breakdown of the plans, losses of material rewards and the demurrage of vessels and railroad cars.

The work of the ports decreased during the fourth quarter: In comparison with the previous year, 255 less vessels were processed including 470 less vessels in December. As the December results show, one of the important qualitative

indicators -- gross and net intensity -- was not a subject of special concern in a number of steamship companies' although it is here that the main reserves for increasing the fleet's carrying capacity and fulfilling branch plans during 1984, including overseas shipping, are concealed. Two items which are wholly connected with the organization of the matter-- the uniform approach of vessels to the ports without any unjustified bunching up and the accurate complete servicing of the vessels -- deserve special attention.

The overall loading plan was fulfilled during December by the transportation centers. All told, 111,768 freight cars were loaded. The overall unloading target was underfulfilled by 8,000 freight cars because of the failure to feed them to the ports. The indicators for supplying empties for imported goods was not fulfilled in December; 4,837 freight cars too few were supplied. This is equivalent to the non-dispatching of 210,000 tons of imported freight from the ports. It is no accident that the amount of imports left in the ports during the month grew.

It is necessary to single out the coordinated work in unloading freight cars of the port and railroad workers in the transport centers of Arkhangel'sk, Murmansk, Ventspils, Klaypeda, Odessa, Nikolayev, Zhdanov, Berdyansk, and Vanino. What prevents other allied ones from working in just as well organized a manner? Primarily, it is the absence of a system in organizing mutually linked planning with a high level of discipline in mutual obligations, formalism, and the conducting of frequent and ineffective sessions of coordinating councils without any thorough working out of short term solutions.

The energetic work of the seamen permitted the USSR Gossnab target for delivering freight to Magadan to be completed for the first time last year. A great deal was done during the year in the transportation center; however, the dispatching of freight from the port remains a stumbling bloc as before. At the beginning of January, the work by the motor transport people was essentially disrupted. The oblast grain product administration base is refusing to accept containers with grain fodder. The steamship company and the port are slow in solving questions concerning the commissioning of the computer information center: The installation and adjustment of the computer are being delayed, programs are not ready, and -- what is the main thing -- the staff does not have the minimum number of personnel required.

Serious tests befell the port in December in connection with the dispatch of citrus fruit. The arrival of cargo with an increased percentage of rejects and in poor packaging brought a great deal of trouble. The Soyuzplodoimport and Soyuzvneshtrans all-union associations again were not equal to the task. This led to a delay in delivering the different orders. Motor vehicle transport, especially the vehicles of the Ministry of the Fruit and Vegetable Industry, are not sufficiently actively involved in the transportation centers. Representatives of this ministry should be immediately included in the work of the coordinating councils especially since an agreement on the conditions and volumes of exporting citrus fruits from the ports during January-May 1984, has been recently achieved.

The duty of the coordinating partners is to place all the reserves of the transportation centers at the service of fulfilling the tasks for 1984 and the five-year plan in general.



## PORTS AND TRANSSHIPMENT CENTERS

### PRODUCTION OF NEW FLOATING CRANE SCHEDULED FOR 1984

Moscow RECHNOY TRANSPORT in Russian No 10, Oct 83 p 29

[Article by A. Usov, chief designer of the "Teplokhod" Plant: "A New Floating Crane"]

[Text] The prototype floating crane with a hoisting capacity of 5 tons under plan 81040 (authors of the plan are Leningrad State Institute for Planning in River Transportation for the hoisting unit and the Gorkiy TsKB [Central Design Bureau] for the pontoon) was turned over for operation by the "Teplokhod" plant. The new model replaces the KPL5-30 cranes under plan R99.

By virtue of extending the operating period in early spring and late fall to increase efficiency, the lower limit of the operating temperature for the new crane is assumed to be equal to minus 20 degrees centigrade (as against minus 10 degrees centigrade for the crane under plan R99), and the ship class is brought to "0" (ice).

In this connection, the new floating crane under plan 81040 differs considerably from its predecessor: the hull of the pontoon is reinforced for floating in broken ice, and the bow and stern transom bulkheads and the side and bottom sections in the vicinity of 0-10 spans and 37-46 spans are reinforced by virtue of installing additional framing. In order to satisfy increasing requirements for maximum permissible levels of noise and vibration, a combination of anti-noise measures was implemented, including the installation of a soundproofing cofferdam between the engine compartment and the living compartment; covering the deckhead and bulkheads of the main and auxiliary diesel generator rooms with acoustically absorbent insulation having a perforated lining; vibration damping of the bulkheads and bottom coverings of the engine and pump rooms and the living quarters; and using a double-wall soundproofing design for the bulkheads and deckheads in the living compartments.

The room ventilation system was changed radically. Being a source of noise, the fans were moved outside, the air duct lines were changed, and their sections extended.

For the purpose of providing stable operation of the diesel generator units and creating normal living conditions for the crew during outside air temperatures to minus 20 degrees centigrade, the structure's heat insulation was increased, heating the water intake units with warm water from the cooling system of the diesel generators was provided, and the output of the electric heaters was increased.

The complement of resources for emergency and warning signalization and automation of the power plant and shipborne systems was expanded, and a foam extinguisher with high-expansion foam was used in accordance with current rules of the RSFSR River Registry and organs of labor protection and sanitary inspection. Guard rails of increased height were installed around the perimeter of the pontoon. The layout of the shower, the washroom and the toilet was improved on the new crane.

A number of changes was made in accordance with remarks from organizations operating the cranes under plan R99: the design of the anchoring spud unit was strengthened, and the hull of the pontoon was reinforced in the space where the deck mechanisms are located. The furniture, inventory and equipment of the quarters were brought in line with the changing requirements of standardized technical specifications. A number of improvements and changes were made in the hoisting unit. The RM-750 and RK-450 reduction gears were replaced with the Ts2N-450 type reduction gears in the hoist mechanism. MTN-612-10 (PV [expansion unknown] is 10 percent) electric motors, which do not require forced ventilation, were used for the purpose of increasing reliability as well as improving operating conditions for the driving gear of the hoist mechanisms and the steering unit.

The designs of the upper frame, the aft girder of the framework, and the oscillation junction of the counterpoise arm were reinforced. Artistic and design studies were made which considerably changed the external appearance of the structure: the architecture of the cabin and the engine room was improved, a continuous lining of guard rails and ladders was introduced, and the shape of the counterpoise arm and the balancing system sector were changed.

On the basis of ergonomic research conducted by the GIIVT [Gorkiy Institute of Water Transportation Engineers], it was revealed that the crane operator's compartment of the floating crane under plan R99 has a number of deficiencies: the crane operator does not have an adequate field of view when processing large cargo ships with high sides, and the equipment inside the compartment does not satisfy the requirements of standards and so forth.

Therefore the compartment on the new crane is located higher. It, together with support by means of a special electromechanical driving gear and a block and tackle, can be tilted forward at an angle of 90 degrees to conserve the crane's headroom in the mobile position. In connection with the compartment's being tilted, the mechanical linkage between the pointer and the instrument, which shows the amount of overhang of the boom, was replaced with an electrical one.

The design changes made it possible to fulfill the requirements of the new GOST [All-Union State Standard] with respect to indicators of reliability and endurance and to provide a technical output coefficient for the crane of no less than 0.8, an average service life of 25 years, and a warranty period of 18 months.

The prototype of the crane is in experimental operation at the Kozmodemyansk port of the VORP [Volga United River Shipping Line].

In accordance with the decision of the selection commission, in 1983 the LIVT [Leningrad Institute of Water Transportation] and the GIIVT should perform research and develop recommendations for further reducing the levels of noise and vibration and improving the anthropometric parameters of the work place and the working conditions of the crane operator, as well as conduct extensometric tests of the hoisting unit.

The "Teplokhod" plant, the Leningrad State Institute for Planning in River Transportation, and the GTsKB [State Central Design Bureau] are completing correction of technical specifications for series construction of the new cranes. Delivery of them will begin in 1984.

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## PORTS AND TRANSSHIPMENT CENTERS

### UNIFICATION OF LENINGRAD'S MARITIME, TIMBER PORTS URGED TO IMPROVE OPERATIONS

Moscow MORSKOY FLOT in Russian No 1, Jan 84 pp 15-16

[Article by V. Gusev, MORSKOY FLOT correspondent: "The Problem is Still Urgent"]

[Text] Over two years ago our journal published an article "Maritime Ports Need a Single Manager" (1981, No 5), which discussed the need to unite Leningrad's maritime and timber ports. This was not a new problem: the collective of the Leningrad Maritime Port had been working persistently and long for a merger between these two neighboring enterprises. The management of the timber port, which is subordinate to the USSR Ministry of the Timber, Pulp and Paper, and Wood Processing Industry, was opposed to the idea of unification. And even though the arguments presented by specialists from the commercial port were more convincing than those presented by their neighbors, the problem was still not resolved after the article appeared.

As in the past, poor departmental coordination has a negative effect on utilization of space and moorages at the timber port.

As the article noted, "compared to the commercial port, with sections rumbling day and night and moorages and docks crammed full of ships and railcars, the timber port looks like a quiet harbor," as has been the case in the past.

In recent years the economy and facilities of the commercial port have undergone continued development and renewal at a rapid rate, which has not been the case at the timber port, even though in terms of area it is larger than the new container terminal.

The maritime commercial port plays a central role in Leningrad's transport center. The timber port is included in the center only as a formality and does not participate actively in the transport process. And while the collective of the maritime port is constantly working to make efficient use of the port, is seeking and finding new forms for organizing the dock workers' labor, and is creating specialized transshipment complexes that operate on a cost accounting basis, the timber port's collective is simply not up to making innovations of this nature.

A sensible proposal has been made that calls for the timber port to retain the functions of preparing timber freight for export shipping, and to transfer its

moorages and part of its territory to the commercial port. The resolution of this issue depends to a great extent on the USSR Ministry of the Timber, Pulp and Paper, and Wood Processing Industry.

The arguments in favor of unification that were presented in the article "Maritime Ports Need a Single Manager" were expressed by specialists working on the shore. But what about the sailors' opinion on this question? Sailors on ships waiting to be unloaded at the Leningrad Commercial Port discussed the issue.

Leningrad weather is very changeable. It can be warm and dry, and then it can rain all of a sudden. You need dry weather to unload food products, so that the dock workers' work is not interrupted. And you also need railcars and river fleet vessels that can receive freight from the maritime ships both in the roadstead and at the docks. At the docks!

The port is designed to operate according to the direct method for processing vessels. Specialized complexes have been put into operation. Port brigades work according to a three-shift schedule. But still vessels stand idle. A whole fleet awaits unloading, scattered among the outer and inner roadsteads, and some ships have been moored temporarily at docks for passenger vessels, which have no spur tracks and no port equipment.

There is no need to ask the dispatchers "who comes after whom". The crews keep track of everything. For example, V. Keze, captain of the Arkhangelsk ship "Igor' Grabar'", knows that his freighter carrying flour will not reach the processing dock until the "Belomor'ye", "Vladimir Favorskiy", and "Nikolay Yaroshenko" are unloaded. While his vessel was waiting in the roadstead, the captain calculated the expenditures resulting from the need to order a tugboat or a launch 2 or 3 times a day to carry the crew back and forth between the ship and the shore. Every time you call for a tugboat, it's a loss of 150 rubles, which is what it costs to run a tugboat for an hour. But here is a freighter, which seems to be moored solidly in the passenger harbor. The captain is warranted in his assumption that his ship will stand idle here for a month. He has already estimated the losses from the layover and the total is significant. And of course, it will not be possible to meet the ship's run quotas in terms of time. This means that the crew will not receive any bonuses, even though it managed to take on 50 tons of freight above the plan in Dunkirk and it did not lose a single hour during the crossing.

There was no need to ask the captain whether the commercial port needed additional moorages: with a 37-hour norm for unloading a vessel, there was a 2-week waiting period and so it turned out that for every 5 running days, over 15 days were spent waiting in the harbor. In other words, the captain and the entire crew of the "Igor' Grabar'" were in favor of uniting the timber and maritime ports under a single manager so that more intensive use could be made of the facilities.

The "Mironych" arrived from Rouen carrying grain. The crew's tortuous waiting began at the Kronstadt roadstead and continued in the port's roadstead. Only on the fourth day did the ship reach an unloading dock that had been freed up. In the opinion of the ship's second mate, A. Nikolayev, as on the previous trip

to Kaliningrad, where the ship stood idle 10 days waiting for processing, the indicator for plan fulfillment on the Leningrad trip would also be no higher than 70 percent.

"If unification of the ports will make it possible to make even partial reductions in the layover time, I'm in favor of it. Our national economy can only profit from this." This was A. Nikolayev's conclusion.

The "Mironych" is one of the "fraternity" of Arkhangelsk ships standing idle in Leningrad as a result of overloading at the commercial port. The White Sea sailors are sharing the fate of ships' crews from other basins. There is no reason to doubt that sailors on these ships were in favor of improving the fleet processing situation. This was confirmed in a discussion with V. Inkin, chief mate on the Baltic vessel "Gus'-Khrustal'nyy". The ship was "guaranteed" a 10-day layover. Even with an intensive 3-shift operation, the port workers could not reduce the layover time of the vessel, which was carrying only 3200 tons of grain.

When the conversation turned to the timber port, the sailor evaluated its operations in his own terms. He said: "In Sweden our ship is loaded in 2.5 days; and in Vyborg, it is loaded in 3 days. At the Leningrad Timber Port the same volume of lumber takes at least a week to load. At the Leningrad port Saturday and Sunday are not working days, which forces the timber freighters to stand idle. This would not happen if the timber port was under the authority of the maritime port."

It seems that it is high time to consider seriously the question of uniting the ports and to examine it from a management perspective. A departmental approach to the problem is justified only when specialists in the timber industry retain the functions of preparing timber for export and the commercial port, fully armed with the experience of organizing freight transshipment, will have the opportunity to make the most efficient use of the port facilities.

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## PORTS AND TRANSSHIPMENT CENTERS

### PROBLEMS IN RAILROAD-RIVER PORT COOPERATION

Moscow RECHNOY TRANSPORT in Russian No 10, Oct 83 pp 4-5

[Article by P. Olenev, department chief of the main freight administration of the Ministry of the River Fleet: "Shipping Freight in Mixed Service"]

[Text] The RSFSR Ministry of the River Fleet is constantly working on improving transport service of the national economy. Thus, for the 1982 navigational period, freight was completely delivered in accordance with consigners' orders, and the entire quantity of grain, vegetables and melon produce presented was transported. National economic freight in the amount of 21.3 million tons was delivered to regions of the extreme north, including the West Siberian oil and gas complex. The full amount of freight was delivered to the Yana River, Dudinka for the Norilsk GMK [mining and metallurgical complex], and the port of Moskalvo on Sakhalin.

At the same time, the shipping lines of the central basins received a shortfall from the railroads of more than 1 million tons of Kuznetsk coal for the power stations of the Ukraine, Leningrad and Kazan. Freight planned for transshipment in the amount of 750,000 tons did not come in for ports of the Irtysh and West Siberian Shipping Lines, and as a result the quota was not fulfilled for shipments to the petroleum producing regions of Tyumen Oblast. Iron pyrites and lumber for transshipment to the Kama and Volga ports and grain for the river elevators of Rostov and Volgodonsk did not come in satisfactorily.

In 1982, 45 million tons of freight with a plan of 54 million tons was shipped in mixed rail and water through service, and that is 1.5 million tons less than in 1981. With a plan of 29.1 million tons, 24.8 million tons came in from the railroads for river transport and with a plan of 24.9 million tons, 20.2 million tons came in from river transport for rail, and that is 2.3 million tons less than in 1981.

Because of the uncoordinated work of river transportation and railroad workers, in a majority of cases the norms for delivery of rail cars turned out unfulfilled. The ports received a shortfall from the railroads in accordance with the plan of 101,900 empty and 98,500 loaded rail cars, and that is equivalent to a loss of loading and unloading resources of 6.1 million tons and 5.9 million tons respectively.

The haulage of rail freight in less than a timely manner resulted in its accumulation at transshipping ports. Thus on 1 January 1983, it was almost 8 million tons, and that is 1.3 million tons more than last year. During the navigational period, the haulage of salt and ore from the ports of Perm, Kambarka and Ufa; timber and coal from the ports of Ust-Donetskiy and Volgodonsk; and sulphuric raw material from Rybinsk was accomplished in a particularly unsatisfactory manner.

During the internavigational period (from November, 1982 to May, 1983), the freight haulage from river ports was unsatisfactory as well. In November, coordinated norms for rail car delivery were fulfilled by 93.7 percent; in December by 68.5 percent; in January by 79.4 percent; in February by 70.3 percent; and in March by 69 percent. On 1 May 1983, the remainder of freight for transfer to rail was 3.7 million tons, and out of this were 521,000 tons of coal; 400,000 tons of ore; 99,000 tons of salt; 27,000 tons of timber; 20,000 tons of scrap metal; and 2.6 million tons of building materials.

The long waiting for hauling freight from the transshipping ports via rail transport reduces its quality and results in the refusal of some freight owners to transport it in mixed rail and water service. In the 1983-1984 period, river transportation workers have the possibility of receiving 6 to 8 million tons of national economic freight from rail transport, including 1.5 million tons of forge coal for the Kashira and Cherepet GRES; 1.5 million tons of iron ore from the Kursk deposit and Kola iron ore concentrate; about 700,000 tons of timber with transshipment at the Kama and Volga ports; 300,000 to 400,000 tons of iron pyrites; up to 1.2 million tons of crushed rock from quarries attracted to river transport; and 1.3 million tons of oil and petroleum products. This would make it possible to release the railroads from a freight turnover of 7 billion ton-kilometers. It is a good thing as well to change over from railroads to river transport the hauling of foreign-trade freight from maritime ports.

However, a portion of the freight does not come in for shipment. Thus in 1983, the USSR Minchermet [Ministry of Ferrous Metallurgy] is presenting a shortfall contrary to the plan of 100,000 tons of blast-furnace ore for Cherepovets; 150,000 tons of ore from the Kursk Magnetic Anomaly for the Ural metallurgical plants; 360,000 tons of granulated slag for the Volga; and 200,000 tons of flux for the Cherepovets metallurgical plant. The USSR Mintsvetmet [Ministry of Non-ferrous Metallurgy] is [presenting a shortfall] of 470,000 tons of iron pyrites; the USSR Ministry of Mineral Fertilizer Production--200,000 tons of apatite; the USSR Minstankoprom [Ministry of the Machine Tool and Tool Building Industry]--200,000 tons of foundry sand from the Bursa quarry; the USSR Minenergo [Ministry of Power and Electrification] and Soyuzglavugol' [Main Administration for Inter-republic Deliveries of Coal]--900,000 tons of Kuznetsk and Karaganda coal with transshipment through the Volga and Kama ports and 650,000 tons of Raychikhinsk coal for the Amur and Komsomolsk TETs. All this has an adverse effect on fulfilling the plan for mixed rail and water shipments.

The early beginning of the 1983 navigational period at shipping lines of the central and northwestern basins revealed a whole series of deficiencies in guaranteeing the freight shipping plan. Shipping lines such as the Kama, Volga United and Volga-Don did not have freight at the berths of the ports by the



opening of the navigational period. The fact that the ports of Tolyatti, Kuybyshev, Kambarka and Chaykovskiy refused to accept iron pyrites and coal in March, since they were not equipped to unload frozen freight from rail cars, served as the reason for this.

The MRF [Ministry of the River Fleet] main freight administration is constantly working to find new freight flows and change them over to river transport. During this year's navigational period, experimental shipments were accomplished for Pechora timber from Naryan-Mar to Arkhangelsk; potassium fertilizers from the "Uralkaliy" industrial association for export; trucks from the KAMAZ [Kama Automotive Plant] to the Ukraine and Krasnodar Kray; fluxes from the Beloruchey quarry to Cherepovets; metal from the Zhdanov "Azovstal'" plant to the Urals; metal from the Cherepovets metallurgical plant to the Gorkiy automotive plant; and others.

However, the shipping lines themselves still are not devoting sufficient attention to finding new bulk freight flows and working with clients in changing over freight from railroads which follow parallel to river routes.

In recent years, the Kama Shipping Line and the Volga United Shipping Line have not changed over a single freight flow. Up to the present time, the freight flow of 500,000 tons of Vorkuta coking coal for the Yasinovka coking by-product plant was not assimilated because it was transported in a poor quality manner by the Volga United Shipping Line during the 1982 navigational period. Not enough freight is being drawn to the Volga-Don Shipping Line. The Northwestern, Northern, Belskiy and all eastern shipping lines are not engaged at all in attracting new freight flows. Our institutes too are somewhat engaged in this work, and the planning and economic and freight administrations of the MRF are not making proper demands of them.

The technical and economic research department of the Gorkiy branch of Gipprochtrans [State Institute for Planning in River Transportation], having at one time done a good job in attracting new freight flows, is not now in a position to accomplish it, since it is only half staffed with personnel having the necessary specialty.

The planned volumes of mixed rail and water shipments are not being accomplished in a number of cases. Thus, the USSR Minlesbumprom [Ministry of the Timber, Pulp and Paper, and Wood Processing Industry] did not present timber through Yaroslavl and Perm; the USSR Minchermet--fluxes from the Komsomolsk mine administration to Cherepovets; the Ministry of Mineral Fertilizer Production--apatites of the "Ammofos" industrial association; Soyuzglavugol'--Kuznetsk and Karaganda hard coal for power stations of the Ukrainian SSR Minenergo; the USSR Mintsvetmet--foundry sand through ports of the Don and iron pyrites through ports of the Kama and the Volga; the USSR Minpishcheprom [Ministry of the Food Industry]--salt from the Baskunchak small industry; and others.

In spite of repeated appeals to shippers, the MRF main freight administration did not achieve a planned presentation of freight to river transport. The situation regarding freight arrival for ports of the center and the northwest, and particularly for ports of the Volga-Don Shipping Line, remains serious for the

entire navigational period. As before, timber to Yaroslavl and Perm; iron pyrites to Tolyatti, Kambarka and Chaykovskiy; coal to Kuybyshev, Syzran and Ulyanovsk; granulated slag to Rostov; and ores, fluxes and crushed rock to Ust-Donetsk are coming in poorly.

The volume of freight shipments in mixed rail and water service depends to a large extent on hauling them in a timely manner from transshipping ports via river ships. The MRF main administration of shipping and fleet operation did not provide supervision of fleet delivery for hauling them. As a result, 600,000 tons still remained in warehouses at the beginning of June. Crushed rock (31,000 tons) was not hauled from the port of Petrozavodsk; iron ore concentrate (70,000 tons) from Medvezhegorsk; coal and intermediate products (15,000 tons) from Cherepovets; timber and foundry sand (18,000 tons) from Gorkiy; and coal and pyrites (42,000 tons) from Tolyatti. In May, 20,000 tons of grain from the Volga ports and 150,000 tons of coal, 12,000 tons of timber and 14,000 tons of iron pyrites from the Kama ports were not hauled.

Just as during the 1982 navigational period, freight from second transshipping ports is not being hauled by rail transport in a timely manner: on 1 June of this year, 5 million tons of freight were located there, including 3.1 million tons of mineral and building materials; 700,000 tons of timber; 700,000 tons of coal; 300,000 tons of ore; and 200,000 tons of salt.

It should be noted that insufficient attention is being devoted to the improvement of freight shipments and shippers are not being made to answer for unfulfilled plans and quotas on shipping freight in mixed rail and water through service.

Thus in 1982, it was envisaged to ship 1.35 million tons of iron pyrites, but in reality only 930,000 tons were presented for shipment. The shipping quotas for timber, iron ore and hard coal were not fulfilled. The position taken by the USSR Ministry of Railways also hinders an increase in the volume of freight shipments in mixed service. Individual workers of the MPS [Ministry of Railways] main freight administration do not consider freight shipments in mixed service with two transshipments to be economically sound, whereas calculations confirm their expediency.

Citing the economic impracticability of such shipments in mixed service, the MPS is refusing to transfer [the following] to river transport: Kuznetsk power coal for Ukrainian SSR power stations, Vorkuta coking coal for the Yasinovka coking by-product plant, Kursk ore for the metallurgical enterprises of the Urals, and Kola iron ore concentrate for the Magnitogorsk plant with transshipment through the ports of Rybinsk and Yaroslavl.

Subsequently (1984-85), changing freight from railroads to river transport can be controlled because of the unsatisfactory state of the berthing economy of consigners and consignees. In the 11th Five-Year Plan, 96,000 meters of berths with a traffic capacity of 37.3 million tons were stipulated through coordinated measures to be built by the river enterprises of various ministries and departments. However, the planning and construction of them is being accomplished in an extremely slow manner. Less than half of the projects are at the construction

stage, and planning estimates were not provided for many of the berths. The actual periods for putting a majority of the berths in operation is the end of the 11th and the beginning of the 12th Five-Year Plans. A number of projects in general were not included in the plan for the 1981-1985 period, including those in Kasimov, Volsk, Zhigulevsk, Voskresensk, Tomsk, Tashar, Strezhevoy, and Megion.

The Minneftekhimprom [Ministry of the Petroleum Refining and Petrochemical Industry] did not allocate capital investments for construction of an 11-kilometer mazut pipeline from the Novo-Gorkiy petroleum refining plant to the river bulk plant. The matter of changing 2 million tons of mazut from rail to river transport was made doubtful.

The Minenergo envisages beginning construction of berths for river TETs' in the Volga basin only in 1984, and in practice that will not make it possible to completely utilize their traffic capacity and fulfill the quota for changing petroleum products from rail in the current five-year plan.

It is necessary for the USSR Minpromstroymaterialov [Ministry of the Construction Materials Industry], USSR Mintsvetmet, USSR Minneftegazstroy [Ministry of Construction of Petroleum and Gas Industry Enterprises], USSR Minugleprom [Ministry of the Coal Industry], USSR Minneftekhimprom, and USSR Minenergo to provide for constructing and commissioning berths of enterprises in charge of them within the established time limits.

The projected measures for construction, expansion and renovation of MRF ports, replenishment of the transport fleet of shipping lines, and an increase in the traffic capacity of fixed-quota route sections must be put into effect in a timely manner with the aim of further augmenting the volume of freight shipments from rail to river transport and increasing the role of the latter in servicing the national economy.

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## PORTS AND TRANSSHIPMENT CENTERS

### ADVANTAGES OF SIMPLIFIED CONVEYOR, STACKERS

Moscow RECHNOY TRANSPORT in Russian No 10, Oct 83 pp 21-22

[Article by V. Malyy of the Ukrainian State Institute for Planning in River Transportation: "Continuous Operation Port Machinery"]

[Text] Other types of equipment, and first and foremost continuous operation installations, are finding ever greater application in river ports right alongside gantry cranes. For the time being, the insignificant dissemination of them is explained by narrow specialization: each machine is intended to perform one specific industrial operation. As a rule, several such machines with a variety of purposes are included in transshipping complexes: for transporting freight, storing, and unloading from the warehouse and loading in ships. The diversity in terms of purpose, productivity, and design execution hampers the organization of series production and forces shipping lines to find the means for manufacturing this equipment in a custom manner at their own enterprises. In connection with the fact that shipping line enterprises usually are insufficiently equipped technically, the solution of this task is causing great difficulties. The creation of equipment with a simplified design is the way out of this situation.

When designing equipment for ports, the Ukgiprorechtrans [Ukrainian State Institute for Planning in River Transportation] is constantly considering this necessity. When creating continuous operation equipment, the designers are striving, apart from directly simplifying the design, to reduce the number of driving gears and to use complete sets of industrially produced items as widely as possible: reduction gears, drums, rollers, hoists and so forth. In spite of the loss to some extent of operational performance on account of this sort of simplification, the equipment created is nevertheless noted for high efficiency. The loaders and stackers developed by the Ukgiprorechtrans can serve as confirmation of this.

A machine for loading crushed rock into ships, and which was manufactured for berths of the combine of mineral and building materials at Mikashevichi (BSSR), is shown in figure 1. It consists of two basic parts: a self-propelled gantry

and a cantilever extendible conveyor. The gantry is installed on moving trolleys and travels on tracks along the berth. The conveyor can move along the guide tracks in the horizontal plane. The height of the gantry is assumed from the arrangement of the waterside belted conveyor underneath it. A coupling unit serves for interaction of the conveyor with the machine. Freight passes along from the belt of this unit to the belt of the cantilever extendible conveyor.

Three mechanisms were used in the structure: one operating unit for moving the belt of the cantilever conveyor and two adjusting ones for extending the conveyor and moving the gantry. By using the latter, freight delivery is provided to any place on the ship's deck, and therefore there is no need at all for a steering unit on the cantilever conveyor. A mechanism for tilting it is absent as well and that considerably simplified the design as a whole, but that deprived us of the opportunity to regulate the dropping height of the freight and to some extent that worsens the performance of the machine, but not so much that it substantially reduces its efficiency. From those very aspirations to simplify the design of the mechanisms for extending the cantilever conveyor and moving the gantry, electric drives without a speed control were used: in the first one there is a short-circuited electric motor with a magnetic starter, and two-speed short-circuited electric motors in the second one. As operational practice has shown, the drives are working in a reliable manner and the dynamic loads which appear when starting the machine do not have an appreciable effect on the state of the metal structures, which are made from steel plate and large-type rolled metal with a minimum amount of welding operations. Simplicity and technological feasibility of the design made it possible to manufacture the machine at a comparatively lightly equipped enterprise--the Minsk machinery plant of the BSSR Minstroyaterialov [Ministry of the Construction Materials Industry]

Table 1. Technical Characteristics of the Machine

<u>Item</u>	<u>Value</u>
Productivity in tons per hour	1,000
Belt width in millimeters	1,200
Fixed output of the electric motors in kilowatts	23.2
Mass in tons	37

The stationary stacker is intended for storing sand and crushed rock (figure 2). Machines of this kind are being operated at the Kiev, Nikolayevsk, and Mogilev river ports. The stacker consists of a tripod and a cantilever conveyor suspended from it. A reduction in the bending moment and, consequently, a decrease also in the mass of the boom were achieved as a result of using block and cable suspension of the boom with the cable attached at two points. In the first prototypes of the machine, the tripod and the boom have a lattice structure, and in the latest one the tripod is made from pipe and the boom from large-type rolled metal that reduced the labor-intensiveness of manufacturing them. Hoists produced by industry are used for turning and raising the boom. The belt conveyor was assembled as well from purchased items. Control is automated.

Table 2. Technical Characteristics [of the Stationary Stacker].

<u>Item</u>	<u>Value</u>
Productivity in tons per hour	500
Belt width in millimeters	800
Overhang of the boom in meters	30
Fixed output of the electric motors in kilowatts	41.5
Mass in tons	19.8

The mobile stacker, which is intended for storing iron ore concentrate and others, is depicted in figure 3. The machine has a rigidly attached boom (without changing the tilt angle and without turning in the horizontal plane). Besides the driving gear of the container, only one drive is used on the stacker for moving it. Giving up other adjusting movements did not substantially affect the operating characteristics, but it did make it possible to considerably simplify the design and reduce the mass and labor expenditures for manufacturing. Large-type rolled steel products were used here as well for the metal structure. Since remote control from the production control point is envisaged, the cab is absent on the stacker. The machine was manufactured at an enterprise of the USSR Minchermet [Ministry of Ferrous Metallurgy].

Table 3. Technical Characteristics [of the Mobile Stacker]

<u>Item</u>	<u>Value</u>
Productivity in tons per hour	1,000
Belt width in millimeters	1,200
Overhang of the boom in meters	10.5
Fixed output in kilowatts	27
Mass in tons	27.4

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## PORTS AND TRANSSHIPMENT CENTERS

### COAL TRANSLOADING DISCREPANCIES AT GORKIY PORT

Moscow EKONOMICHESKAYA GAZETA in Russian No 3, Jan 84 p 8

[Article by F. Zelenkov, candidate of technical sciences: "It Has Been Written Off -- That's Done, Thank Goodness"]

[Text] The transloading of coal from river to railroad transport for its delivery to the consumer -- the USSR Ministry of Power and Electrification's Igumnovskaya TETs (Heat and Electric Power Station) -- takes place in the Gorkiy river port. At the end of the navigation period, the port and the customer conduct a mutual quantitative inspection of the coal which has arrived in the port of Gorkiy in accordance with the documents for the direct mixed railroad and maritime service and which was subsequently sent to the Igumnovskaya TETs. During this, only the maximum possible values of the existing natural loss norms, which are equal to 2.9 percent of the amount of coal sent to the port of Gorkiy, are used.

Annually up to 30,000 tons of coal are treated as natural losses by the port.

However, the shortage of coal actually revealed upon receipt at the port, taken together with possible losses during transloading is considerably less than the amount of cargo regarded as natural losses. Thus, in 1981 and 1982, more than 16,000 and 13,000 tons respectively valued at 337,000 and 267,000 rubles were unnecessarily treated as natural losses above the actual shortage.

Thus, the amount of coal, which is regarded as natural losses, exceeds several-fold the detected actual shortage.

A paradoxical situation arises in this regard. When weighing the cargo sent by the port, the customer detects a significant shortage of coal in comparison with the transportation documents. Thus, for example, the shortage during these same years was more than 30,000 tons and approximately 50,000 tons, respectively. How could this arise when the transportation distance is about 30 kilometers and how could the recipient consent to such shortages?

It is not difficult to answer. The underloadings and shortages, which are within the limits of natural loss norms, do not especially worry the consumer. That is why the writing off as "production costs" of annual losses of thousands of tons of coal occurs painlessly.

You see, there are within the RSFSR Ministry of the River Fleet system collectives which generally refuse to apply obsolete natural loss norms. They have acted this way for three years now in the Kineshemskiy river port. The writing off of thousands of tons of fuel has been averted.

It would be worthwhile for the directors of the Volga River Steamship Company and the Gorkiy Maritime Transport Engineer Institute, where work is now taking place to review the natural loss norms for coal during its transportation by river transport, to become interested in this experience.

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## PORTS AND TRANSSHIPMENT CENTERS

### BRIEFS

WINTER NAVIGATION TO CHUKOTKA -- For the first time in the history of maritime navigation, the port of Egvekinot on the Chukotka peninsula has begun to operate without a winter "recess". The last ship of this year, the motorship "Bodaybo" accompanied by the icebreaker "Vladivostok", has left Egvekinot's waters. But this time it did not sound a farewell blast on the whistle because navigation into the port is being continued into the following spring. The basic possibility of year-round delivery of freight by sea to a port on the east coast of the Chukotka peninsula was confirmed last winter by an experimental voyage into these latitudes by the diesel-electric ship "Vasiliy Fedoseyev" accompanied by the icebreaker "Admiral Makarov". That voyage said to Far Eastern seamen that the flag of navigation in the Bering Sea will not be lowered year-round. (TASS) [Text] [Moscow VODNYI TRANSPORT in Russian 27 Dec 83 p 4] 9136

NEW SHIPYARD CRANE -- Krasnoyarsk -- A new 27.5-ton capacity portal crane, manufactured in the German Peoples Republic, has been put into service at the Krasnoyarsk Shipyard. Its installation was carried out by Leningrad and Krasnoyarsk specialists. Use of the crane will permit the enterprise to build ships in large sections, which assures high labor productivity. [By our special correspondent G. Simkin.] [Text] [Moscow VODNYI TRANSPORT in Russian 29 Dec 83 p 4] 9136

VOSTOCHNYI PORT GAINING STRENGTH -- Nakhodka -- The processing of container ships has been speeded up at Vostochnyy Port. Yesterday, a second container pier which can simultaneously unload two oceangoing container ships was put into operation. Vostochnyy Port, where wood-chip, timber, and coal handling facilities and the first container terminal already are in operation, is steadily gaining in capacity. It is planned to build more than 60 berths here with a freight turnover of 40 million tons. In this Five-Year Plan, hydraulic engineering constructors plan to complete another pier for processing containers and a large plant for repairing them. (TASS) [Text] [Moscow VODNYI TRANSPORT in Russian 31 Dec 83 p 1] 9136

FERRY CROSSING STARTED -- Klaipeda, Lithuanian SSR -- With the deepening of the channel, construction of the international rail car ferry crossing has been started in the Kursk gulf. It will connect Klaipeda with the port of Zasnits-Mukran in the GDR. (TASS) [Text] [Moscow VODNYI TRANSPORT in Russian 3 Jan 84 p 1] 9136

ZHDANOV CONTAINER TERMINAL -- Zhdanov -- A specialized pier being built in the Zhdanov maritime commercial port will increase the volume of container processing. The first stage of a terminal for receiving large tonnage container ships has begun to operate here. Specialists of the Crimean Maritime Hydraulic Construction Trust have had to do a great deal of complicated work. The complex geology of the ground required laying below-ground footings at a depth of almost 20 meters. Nevertheless the expenditures for it were reduced by more than one million rubles. When the output of the facility is at planned capacity, the volume of container processing in the port of Zhdanov will be increased by a factor of 3.5. (TASS) [Text] [Moscow VODNYI TRANSPORT in Russian 5 Jan 84 p 1] 9136

NEW FLOATING CRANE -- Sevastopol -- The Sevastopol Maritime Shipyard Association imeni S. Ordzhonikidze yesterday transferred into operation a self-propelled floating crane with a rotating boom having a 500-ton load lifting capacity. The craft opens a new series of cranes of the "Slava Sevastopol" class. The crane is almost twice as powerful as those the enterprise produced earlier. Its water displacement, however, has increased by not more than ten percent. For such results, advanced types of structural shapes and other design solutions were used. The new crane has increased speed and maneuverability. It can be used in coastal waters and ports at any latitude. (TASS) [Text] [Moscow VODNYI TRANSPORT in Russian 5 Jan 84 p 4] 9136

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## INTERSECTOR NETWORK DEVELOPMENT

### PROGRESS OF CEMA COOPERATION IN TRANSPORTATION SECTORS

Moscow EKONOMICHESKOYE SOTRUDNICHESTVO STRAN-CHLENOV SEV in Russian No 8,  
Aug 83 pp 20-22

[Article by Janos Pirisi, CEMA Secretariat: "The Effectiveness of Cooperation in Transport"]

[Text] The process of socialist economic integration is accompanied by diverse development of ties among the cooperating countries, an increase in the volume of reciprocal deliveries, and an expansion of the sphere of integration processes by drawing non-European CEMA member countries and remote northern and eastern areas of the USSR into these processes.

This kind of development logically leads to an increase in the role of transport, which is called on to provide complete and uninterrupted support for the ever more complex and ever-expanding economic ties among CEMA member countries with minimal expenditures of living and embodied labor. Minimizing transport costs is becoming a more important factor in the economic effectiveness of the international socialist division of labor.

Over the past years, within the framework of CEMA's working organs, an extensive system has been created for providing planning solutions for problems involved in meeting the transport needs of development and in expanding socialist economic integration. This system includes:

- joint forecasting of transport development;
- coordination of plans for the long-range development of transport, which are embodied in the Long-Range Special Program for Cooperation among CEMA Member Countries in the Development of Transport Ties;
- coordination of five-year plans for the development of transport;
- annual agreements on the volume of reciprocal shipments.

An important role in the development of cooperation in transport has been played by the system of control created within the framework of CEMA working organs; this system monitors the fulfillment of decisions and it includes regular analyses of the fulfillment of agreed-upon shipments and measures being taken to provide these shipments under five-year plans and separate annual

plans; it also includes regular preparation of analytical reports for higher CEMA organs.

Cooperation among CEMA member countries in transport planning has done a great deal to help resolve a number of major problems involved in increasing the effectiveness of cooperation among the transport systems in countries of socialist cooperation. The following achievements should be mentioned:

--stepped up increases in the carrying capacities of main international railroad lines, primarily by means of electrification and equipping them with contemporary signal, centralization, and block systems; by building secondary tracks and two-track inserts; and by reinforcing and rebuilding the upper part of the track;

--an increase in the carrying and processing capacity of border railroad stations, in particular specialization of transshipment stations and creation and development of high-capacity transshipment complexes and systems for rearranging railcars at these stations;

--an increase in the processing capacities of maritime and river ports, and especially construction of highly mechanized (and specialized) docks, open and covered storage facilities, and refitting of ports so they can receive vessels of larger tonnage;

--improvement of the network of highways that join the most important industrial, cultural, administrative, and tourist centers in CEMA member countries, by building high-grade roads and converting existing roads that carry a lot of international traffic to higher grades, and raising the level of the roads' technical and operational organization;

--development of a network of international airports and improving their technical equipment;

--expansion of the network of container centers and opening new international container service lines;

--creation and development of an international network of main pipeline transport.

All these measures, included in the Long-Range Special Program for Cooperation in the Development of Transport Ties and those agreed upon in the course of coordinating five-year plans to develop transport, are meant to provide prompt and uninterrupted fulfillment of the economically based demands of countries of socialist cooperation for reciprocal freight shipments and passenger transport with the maximum economic effect.

Railroad transport, in spite of a certain decline in its share of the transport responsibilities, will continue in the future to play a leading role in shipments among CEMA member countries; there are plans for the reconstruction and technical refitting of 14 main east-west railroad lines and 4 north-south lines. The Long-Range Special Plan for Cooperation in the Development of Transport Ties calls for the construction of more than 2100 km of secondary

track and two-track inserts on these lines; providing 7500 km of the lines with automatic blocking and centralized control; reinforcement and reconstruction of the upper part of almost 9500 km of track; and introduction of electric traction on 6300 km of railroad. There are also plans to develop a number of border stations.

During the course of coordinating plans for 1981-1985 and during their implementation, a number of amendments were made which will make it possible to accomplish the planned goals with lower capital investments. In Bulgaria, for example, the rate of electrification and laying down secondary tracks (including spur tracks to ports) has been stepped up. In the GDR electrification of the Rostok-Berlin-Bad Schandau line is being carried out at a stepped-up pace. Secondary tracks are being built on a number of railroad divisions in the USSR, automatic blocking and centralized control are being introduced, and electrification is being expanded. At the intersection of the Hungarian, USSR, and CSSR borders, work has been started on developing the Batevo-Epereshke border crossing and on construction of a new crossing between Uzhgorod and Matevice. Other measures are also being carried out for the further development of the Zahony and Chop-Batevo transshipping regions. Work has been started on reinforcing the Ulaanbaatar Railroad and divisions of the East Siberian Railroad with which it intersects.

In accordance with plans that have been drawn up, ports in Bulgaria, Hungary, the GDR, Cuba, Romania, the USSR, and CSSR are undergoing development.

"Interlikhter" [Interlighter], the international economic shipping enterprise is undergoing intensive development. Two lighter boats provide transport of lighters between Ust-Dunaysk ports (USSR) and ports in Vietnam, Kampuchea, Malaysia, India, and Pakistan.

Bulgaria and the USSR have developed a highly sophisticated, technical complex for ferry service between Varna and Ilichevsk.

The planned development of four basic routes for international motor vehicle traffic among CEMA member countries is being carried out at a somewhat retarded rate. This is due primarily to the fact that countries of socialist cooperation are still in the process of working out their economic policies regarding motor transport under the current conditions of higher fuel prices and a general policy for conserving fuel and power resources.

In addition to this, Bulgaria, Hungary, the GDR, the USSR, and CSSR are doing a significant amount of work to equip motor highways with passenger service facilities and transport facilities.

Work on the reconstruction and technical refitting of international airports is being carried out within the prescribed time periods. A number of new joint international air routes are now in operation (Varna-Tbilisi, Sofia-Tyumen, Budapest-Simferopol, Bratislava-Sochi, Prague-Simferopol, etc.)

Measures for the development of container shipping are being implemented systematically, in addition to measures for shipping especially heavy and large freight.

In spite of the implementation of all these measures, however, there are still certain problems in maintaining transport ties between CEMA member countries. These problems are particularly evident in the intensive work being done at border railroad stations (and at transshipment centers especially), in the hold-up of ships in ports, and in the higher degree of freight spoilage during transport.

An analysis of the reasons for this state of affairs shows that it is tied in the first place to irregular delivery of freight on the part of the dispatchers, which causes an exceptionally high level of intensity in the work done at border crossings and ports; in the second place, it is tied to incomplete fulfillment of technical and operational measures agreed upon by the countries during their coordination of plans. Furthermore, the potential of motor transport and especially river transport is underutilized.

The importance of completely overcoming the existing problems in shipping among CEMA member countries is heightened even more in light of the fact that as the international socialist division of labor develops and expands, in particular within the framework of the Long-Range Special Plans for Cooperation in the basic sectors of physical production, transport is faced with new and increasingly complicated tasks that are tied primarily to improving the quality and efficiency of the transport process. For this reason questions of improving the forms and methods of the planning organization for cooperation among transport systems of CEMA member countries is always at the center of attention of CEMA agency staff members.

In 1982, section 1 of the CEMA Permanent Commission for Transport, which is involved in the coordination of plans and complex transport problems, considered proposals for improving the coordination of plans to develop transport among CEMA member countries on a yearly basis, which call for raising the level of complexity of annual international shipping plans that were approved at the 66th Meeting of the Commission (in July 1982).

In accordance with the Commission's operating plan for 1983-1984, section 1 has started working on problems that take into account factors of energy consumption in distribution of shipping responsibilities among various forms of transport; improving the planning and reporting, data and statistical base on international shipments (converting non-weight units of measurement into weight units, presenting planning and reporting data in comparable form, more precise definition of freight nomenclature that is used in annual and five-year plans, etc.), as well as improving the transport of perishable cargo.

In fulfilling the goal of making further improvements in the transport ties among CEMA member countries, it is necessary to take into account the shifts that have occurred in the development and intensification of socialist economic integration. In the area of transport the following factors should be given special attention:

--expanding the territorial sphere of developing integration processes that are in need of transport support;

- increasing the number of contacts in international economic ties;
- increasing the volume and value of freight that needs to be shipped, and expanding and diversifying the commodity composition of this freight;
- increasing the share of transport expenditures in total expenditures as an important factor in the economic effectiveness of the international socialist division of labor.

All these factors are accompanied by a rise in the demands for quality in the implementation of the transport process, first and foremost in the speed, regularity, and reliability of shipments; these factors also require that freight be well protected and that living and embodied labor input on transport be minimized.

The following aspects are especially important in improving the system of coordinating plans for the development of transport:

- All elements of this system should be complex in nature (they should include all forms of transport). The fact is that annual coordination of the size of reciprocal shipments among CEMA member countries, unlike all other forms of cooperation in transport planning activity, is not carried out in a unified manner, but separately for each form of transport. Therefore, when annual agreements are made, there is inadequate consideration of the possibilities for optimal distribution of shipments among various forms of transport on the basis of the maximum effectiveness criterion.
- Improvement of the economic mechanism for distributing shipments among various forms of transport and routes on the basis of socially necessary transport expenditures. It is widely known that the real distribution of shipments is carried out today by foreign trade agencies signing delivery contracts. In this connection, a question arises of creating a mechanism for economic relations between transport and foreign trade, under which the level of effectiveness of transporting foreign trade goods would be directly reflected in the level of effectiveness of foreign trade.
- Providing a more complete accounting of the peculiarities involved in shipping various types of freight when coordinating plans for the development of transport (and in particular, when determining the required capacities of transshipping facilities). An analysis of freight shipments among CEMA member countries over recent years shows that serious qualitative changes are taking place in their commodity composition: there is a steady rise in the role of highly processed goods, the structure of the goods turnover is becoming more complex, and so on. This kind of development adds urgency to the question of more efficient utilization of specialized rolling stock and equipping transshipping centers and ports with the appropriate specialized machinery.
- Over recent years CEMA working organs have done a considerable amount of work to improve the freight nomenclature that is used in the coordination of plans. It seems to us that now it is becoming even more important to continue this work, keeping in mind the importance of earmarking the freight that requires special transport conditions (for example, groups of freight such as chemical

products, machinery and equipment, and perishable goods, all with widely varying shipping requirements).

--Improving the forms used in coordinating plans, providing transport with technical means and materials. Two aspects of this problem are particularly important. On the one hand, the coordinated demands of transport for basic technical means and materials, not provided by the production enterprise itself, should be carried out on the basis of a complete list of these means and should contain only those demands that have monetary and financial support. Without this it is impossible to make decisions on satisfying the demands on the basis of reciprocal deliveries. On the other hand, the results of coordinated transport plans need to reflect the agreements that have been reached on reciprocal delivery of transport means and materials, since this is of fundamental importance for the entire organization of transport operations.

--The creation of conditions for making the transition in basic mass and perishable freight from coordinating its shipment on the basis of volume of transfers at borders and ports to planning freight flow from the place of production to the place of consumption. This transition would provide a basis for true optimization of shipments, since it could be implemented only by including the entire course of the freight.

--Increasing the responsibility (performance discipline) in all quarters, including material sectors, for realization of decisions agreed upon during the coordination of plans, by expanding the practice of contractual consolidation of these decisions.

Furthermore, it would also be desirable to study the experience of solving transport problems within the framework of agreements on cooperation and specialization of production (questions involving the delivery of oil and natural gas, transport support for olefin complexes), since this comprehensive approach provides the best opportunities for minimizing total expenditures on production and transport of specific products.

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## INTERSECTOR NETWORK DEVELOPMENT

### CEMA FREIGHT, PASSENGER TURNOVER STATISTICS

Moscow EKONOMICHESKOYE SOTRUDNICHESTVO STRAN-CHLENOV SEV in Russian No 8,  
Aug 83, pp 26-28

[Article by Bela Sabadi, CEMA Secretariat: "The Development of Transport in European CEMA Member Countries"]

[Text] Between 1970 and 1981 the turnover of freight and passengers in European CEMA member countries underwent dynamic growth, the renewal and replacement of rolling stock and the fleet continued, there was expanded use of the container system, there was greater mechanization of loading and unloading operations, and more.

As a result of economic development, an increase in the output of industrial and agricultural products, and the expanded foreign trade turnover, the demand of CEMA member countries for freight shipments has increased. In 1981 the freight turnover in general use transport in European CEMA member countries reached 6.9 trillion ton-kilometers, which represents a 62 percent increase over 1970; this included a 66 percent increase in Bulgaria, a 60 percent increase in Hungary, an 18 percent increase in the GDR, a 62 percent increase in Poland, an 87 percent increase in Romania, a 64 percent increase in the USSR, and a 30 percent increase in the CSSR.

Many different forms of transport are used to make these shipments. Each form of transport has its special features which determine the sphere of its effective utilization at the given stage of development.

The distribution of shipments among the various forms of transport depends on many economic and geographical-economic factors (the level of development and structure of the national economy, the size of the country, the territorial distribution of production, the role and geographical distribution of foreign economic ties, and so forth). The differences among these factors in various European CEMA member countries leads to a situation in which the structure of their transport systems also differs to a certain degree (see the accompanying table).

In spite of the existing differences in the transport structures, there is a general trend in the countries toward reducing the role of railroad shipments and toward increasing the proportion of motor and oil pipeline transport in the total freight turnover. During this period the proportion of air shipments

essentially did not change, and the proportion of river shipments dropped slightly. The proportion of maritime transport declined in several countries, and in other countries it rose.

Although in the majority of European CEMA member countries the proportion of railroad transport is declining, the volume of its freight turnover is rising steadily. It was only in the GDR that the proportion of railroad transport in the total freight turnover did not change between 1970 and 1976, but since 1977 it has been steadily rising.

The working length of the railroads in Hungary, the GDR, and Czechoslovakia declined during this period, while in Bulgaria, Poland, Romania, and the USSR it increased. CEMA member countries devote a great deal of attention to modernization of their locomotives, and in particular to electrification of the railroad lines. In Bulgaria the proportion of electrified lines rose from 19.3 percent in 1970 to 40.5 percent in 1981; in Hungary the increase was from 10.2 percent to 20.6 percent; in the GDR, it went from 9.3 percent to 12.6 percent; in Poland, from 16.6 percent to 29.1 percent; in Romania, from 4.5 percent to 24.4 percent; in the USSR, from 25.0 percent to 31.4 percent; and in the CSSR, from 18.9 percent to 23.5 percent.

In all the European CEMA member countries the importance of motor transport is growing. This is explained by the fact that motor transport has a number of special features which make it possible to achieve effective operating results in many cases. Among these features are: a high degree of maneuverability, which makes it possible to pick up freight at its production site and deliver it to its destination without any intermediate operations; relatively rapid delivery time; and the possibility of providing efficient service for freight shipments of any kind. Motor transport is being used especially efficiently for local shipments. The average shipping distance for 1 ton of freight is lowest for this form of transport (in 1981 it ranged from 21.1 km in the USSR to 59.3 km in Poland).

Recently motor transport has also been playing a larger and larger role in shipping over longer distances, in those cases when the advantages described above are especially noticeable (for example, when shipping perishable goods, and the like). Between 1970 and 1981 the average distance for shipments by motor transport in European CEMA member countries per ton of freight increased by 20-84 percent.

Motor transport has long exceeded all other forms of transport in terms of the volume of goods shipped. In 1981 in Bulgaria motor transport accounted for 70.8 percent of all freight that was transported; in Hungary, it accounted for 61.3 percent; in Romania, 58.4 percent; in the USSR, 56.0 percent; and in the CSSR, 52.7 percent. Only in the GDR and Poland during that same year was railroad transport responsible for over half of all freight shipped by general use transport.

During this period intensive work was done in European CEMA member countries to improve the highway network. The length of hard-surface roads increased in all the countries. The rise in the USSR was especially high (there was a 52 percent increase).

Between 1970 and 1981 oil pipeline transport underwent dynamic development. This was tied to an increase in the demand for oil and petroleum products in CEMA member countries, as well as to the advantages of this form of transport in carrying large amounts of oil and petroleum products over large distances (high carrying capacity, relatively low transport costs, etc.)

As a result of the rapid development of oil pipeline transport, its proportion in the countries' total freight turnover also rose and in the majority of European CEMA member countries it already exceeds river transport in terms of the volume of work performed. This form of transport plays an especially important role in the Soviet Union, which is a major oil producer and exporter. In the USSR oil pipeline transport is second only to railroad transport in terms of total freight turnover. The demand of European CEMA member countries for oil is met for the most part by deliveries from the Soviet Union.

The length of the oil pipeline network has been growing steadily and in 1981 it totaled about 77,000 km (not including Romania and the CSSR). The USSR has the most highly developed network, with about 71,000 km of pipeline. It should be pointed out that the largest oil pipeline in the world, "Druzhiba" [Friendship], is in operation in European CEMA member countries, delivering oil to Hungary, the GDR, Poland and the CSSR.

River transport is relatively inexpensive and it is used to ship a fairly large volume of freight. It is true that this form of transport is not very rapid, and it is very dependent on climatic and weather conditions. In most of the countries between 1970 and 1981 the proportion of shipments made by river transport declined somewhat; Romania experienced no changes and in Czechoslovakia it rose slightly.

The development of maritime transport in European CEMA member countries during this period varied greatly. Hungary experienced the most dynamic growth in the freight turnover in this form of transport; between 1970 and 1981 it increased by a factor of more than 5. During the same period in Poland and Romania the freight turnover in this form of transport increased by a factor of 2; in Bulgaria there was a 63 percent increase; in the GDR there was a 2 percent rise; in the USSR there was a 30 percent increase; and in the CSSR, a 17 percent increase. The rise in the freight turnover was primarily the result of an increase in the volume of freight shipped; the average shipping distance per ton of freight by maritime transport increased only in Hungary and Poland.

The development of maritime transport in European CEMA member countries was brought on mainly by expanded foreign trade ties (coastal shipping, except in the USSR, is insignificant). Evidence of the great importance of maritime shipping in the development of foreign economic ties can be seen in the fact that this form of transport reached a certain level of development even in those countries without their own maritime ports (Hungary and Czechoslovakia). In 1981 in Bulgaria maritime transport accounted for 65.9 percent of the total freight turnover; 14.6 percent in Hungary; 49.7 percent in the GDR; 61.2 percent in Poland; 50.9 percent in Romania; 14.2 percent in the USSR; and 11.8 percent in Czechoslovakia.

Air transport is the most rapid form of transport and can provide a significant saving of time in the delivery of freight. It is, however, the most expensive form of transport and therefore its role in shipping freight is still relatively small.

Between 1970 and 1981 capital investments made to develop transport increased in Bulgaria by a factor of 3; in Hungary by a factor of 1.4; in the GDR by a factor of 1.6; in Poland by a factor of 1.2; in Romania by a factor of 2.5; in the USSR by a factor of 2.1; and in the CSSR by a factor of 1.5. It should be pointed out that these increases turned out to be insufficient to eliminate emerging difficulties. The development of transport in part lags behind the rise in the freight turnover, and shipments are often made with an excessively intensive utilization of available capacities, which has a negative effect on the quality of work, and on the prompt and complete satisfaction of demands for freight shipments. Railroad transport can be used as an example of excessively intensive utilization of capacities. In European CEMA member countries the volume of freight shipments per 100 km of railroad is significantly higher (in certain cases several times higher) than in European capitalist countries.

A reduction in the national economies' consumption of transport resources by reducing the material consumption of production and eliminating inefficient freight flows can help decrease the intensity of transport operations. According to several estimates, CEMA member countries have considerable reserves for reducing production's consumption of transport resources.

The development of territorial division of labor and expanded economic, social, scientific, and cultural ties both within the countries and among separate states are accompanied by a steady rise in the passenger turnover. In European CEMA member countries the total passenger turnover on general use transport was 1257 billion passenger-kilometers in 1981, which is 61 percent higher than in 1970. There was a 60 percent increase in this indicator in Bulgaria; a 30 percent increase in Hungary; a 30 percent increase in the GDR; a 47 percent increase in Poland; a 92 percent increase in Romania; a 68 percent increase in the USSR; and a 31 percent increase in Czechoslovakia.

In addition to the rise in passenger turnover, there have been substantial changes in the importance of various forms of transport. The structural changes are characterized primarily by a drop in the proportion of railroad transport and an increase in the proportion of motor and air transport. The proportion of rail transport remained basically the same only in the GDR, while in the other countries it declined considerably. Between 1970 and 1981 in Hungary and the CSSR, not only did the proportion of railroad transport decline, so did the absolute number of passenger-kilometers provided by railroad transport.

In spite of the trend toward reduction, however, in many countries railroad transport still plays the leading role in passenger transport. In Poland 1981 rail transport accounted for 51 percent of the entire passenger turnover on general use transport; in GDR it accounted for 48.4 percent; and in Romania, 47.4 percent.

Passenger travel by motor transport is growing at a rapid rate and the proportion of motor transport in the total passenger turnover is rising. In Bulgaria, Hungary, the USSR, and Czechoslovakia, motor transport already accounts for the highest proportion of the total passenger turnover on all types of general use transport. Passenger travel on river and maritime transport is quite insignificant and the proportion of these forms of transport in the total passenger turnover does not change in any substantial way.

Air transport is undergoing rapid development and has turned into a form of mass passenger transport. Air transport has been developed most extensively in the USSR, where it accounted for 18.5 percent of the total passenger turnover in 1981; this is equivalent to 50 percent of the passenger turnover on the country's railroads.

In other European CEMA member countries air transport is used primarily for international travel; the proportion of air transport in these countries is one-half to one-sixth what it is in the USSR.

Further development of freight and passenger transport in CEMA member countries will be aided by realization of the Long-Range Special Program for Cooperation in the Development of Transport Ties, which was adopted at the 33rd Meeting of the CEMA Session (in 1979), and which outlines the most important goals for coordinated development of these countries' transport systems, taking into account ties with the European transport network up to 1990.

The proportion of various forms of transport in the total freight turnover of all forms of general use transport (in percent)

(1) Страна	(2) Годы	Транспорт (3)					
		(4) железно- дорож- ный	(5) автомо- бильный	нефте- провод- ный (6)	(7) речной	(8) морской	(9) воздуш- ный
НРБ (10)	1970	23,9	5,9	—	3,1	67,1	0
	1981	18,8	11,7	1,0	2,6	65,9	0
ВНР (11)	1970	76,0	11,0	2,6	6,1	4,3	0
	1981	58,5	14,9	6,9	5,0	14,6	0,1
ГДР (12)	1970	34,1	5,1	1,8	1,7	57,3	0
	1981	39,0	6,6	3,3	1,4	49,7	0
ПНР (13)	1970	45,2	2,0	3,2	1,0	48,6	0
	1981	30,9	2,8	4,6	0,5	61,2	0
СРР (14)	1970	48,8	5,8	2,1	1,5	41,8	0
	1981	38,0	7,0	2,6	1,5	50,9	0
СССР (15)	1970	67,9	1,7	7,7	4,7	17,9	0,1
	1981	58,2	2,3	21,0	4,2	14,2	0,1
ЧССР (16)	1970	69,8	6,1	8,0	3,0	13,1	0
	1981	63,9	10,9	9,7	3,7	11,8	0

- |                      |                 |             |
|----------------------|-----------------|-------------|
| 1. Country           | 6. Oil pipeline | 11. Hungary |
| 2. Year              | 7. River        | 12. GDR     |
| 3. Form of transport | 8. Maritime     | 13. Poland  |
| 4. Railroad          | 9. Air          | 14. Romania |
| 5. Motor             | 10. Bulgaria    | 15. USSR    |
|                      |                 | 16. CSSR    |

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## EXPERIMENTAL SYSTEMS

### RECENT DEVELOPMENTS IN SOVIET ACV DESIGN

Moscow SOVETSKAYA ROSSIYA in Russian 21 Dec 83

[Article written by Candidate of Technical Sciences Ye. Gik: "On A Cushion of Air"]

[Text] K. Sysoyev, Novosibirsk: "One day I saw a strange-looking vehicle "gliding" along the snow-covered fields. Later on it was explained to me that this vehicle was moving on a cushion of air. Please tell me more about such machines."

Designers in many countries of the world are trying to develop all-terrain vehicles which can operate in swamps, ravines and on large bodies of water. These vehicles are of many different designs.

Like a speedboat occasionally touching the land surface or a hovercraft using a special wide, short wing to compress the air underneath while in motion, vehicles with an air cushion create a layer of air underneath by means of a propeller and support this layer with a leather "tent."

The Neptune Central Construction Office has obtained some interesting results. Designers who produced the air-cushion vehicle obtained a speed of 50 km per hour in runs over water; it performed well over broken ice in flood waters, these "crumbled highways." And the chief feature of the vehicle is that the cushion of air is not created by a propeller, but rather by a jet stream of air.

Also promising is the aero-sleigh. This vehicle was designed at the N.Ye. Zhukovskiy Central Institute of Aerohydrodynamics; its engine is rated at more than 300 horsepower, which allows it to carry heavy loads. Researchers at the Yakutsk Affiliate of the Siberian Department of the USSR Academy of Sciences believe that use of such light sleds will provide at least R3 million to the region's economy.

This latest technology will be most valuable in the endless icy wastes of the Arctic and Anarctic. In time such vehicles will displace current transportation modes.

Production of these roadless vehicles is still limited, but future production is promising.

## EXPERIMENTAL SYSTEMS

### IMPROVED AIR CUSHION PLATFORM POWERED BY VACUUM CLEANER

Moscow SOTSIALISTICHESKAYA INDUSTRIYA in Russian 12 Jan 84 p 4

[Article, under the rubric "Experiment Proceeds", by L. Rodzinskiy: "Gliding on a Stream of Air"]

[Text] "Would you like to go for a ride?"

The question was posed in such a tone as if I were offered a magic flying carpet. Well in fact O. Ivanov, docent and candidate in technical sciences at the Novocherkassk Polytechnical Institute, did ask me to stand on a small platform, something like a railroad cart, but without wheels. A household vacuum cleaner, the Vikhr', was fastened to the middle of the cart, and a long cord ran from the vacuum to an electrical outlet.

Oleg Pavlovich turned on the vacuum, and the platform beneath me vibrated ever so slightly. Then the most interesting thing happened: the researcher just tapped the platform with his foot, and this platform...zipped across to the far wall--very smootly. At a sign from O. Ivanov several students stood on the platform, and even with such a load it moved easily around the laboratory.

"As you see," explained Oleg Pavlovich, "everything depends on the air cushion. It serves as a sort of lubricant between the floor and the bottom of our glide platform."

"But many specialists just aren't enthused about the air cushion. They believe that high energy consumption prevents its widespread use. For us, however, the power supplied by an ordinary vacuum cleaner is sufficient to propel the heavy load. And just how much energy does a vacuum cleaner use?"

"The distance between the bottom and the floor is critical," explained my fellow conversationalist. "If it is even measured in millimeters, as in usual designs, then the air cushion will certainly require a lot of energy. We succeeded in reducing this distance to several tenths of a millimeter, and the graph of the phenomenon changed dramatically...."

"But how were you able to get such a small gap? The gap depends on the volume of air necessary to transport the load."

Oleg Pavlovich led me over to a table on which were oval steel disks of various sizes, ringed with elasticized rubber.

"The air is compressed in usual models by a powerful fan underneath, inside of a rubber mount. And there is a lot of noise. We pierced the rubber with many tiny openings out of which the air flows, almost silently. The confluence of these tiny streams creates the thinnest layer of air. These disks, which we call support modules, can be installed on any piece of equipment. The stronger the support, then the higher the lifting capacity. And when the fan motor is turned off, the equipment gently sits down on its steel bottom."

The first support modules were used in building slips at the Sochinskiy port. They really simplified repair work on ships of the Nevka type, whose weight is almost 10 tons. The microscopic air cushion allowed several workers to position the repair boat in the slipway.

"And there is still one more possibility, this one tested in practice." The researcher directed me to a large model of a gantry crane. But this crane was for some reason not set on rails, but rather on these support modules.

"Rails aren't needed here," he explained. "The crane on modules can easily move about the entire construction site, carrying loads weighing several tons."

"But," O. Ivanov concluded, "the main use for the air cushion is in construction. We believe that the support modules will replace the many rollers, conveyors, drive carriages, lift cranes, pushers--in short, all the varied and not always reliable machinery which is used to transport various loads."

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