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USSR Report

TRADE AND SERVICES

(FOUO 14/79)

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USSR REPORT
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MANPOWER: LABOR, EDUCATION, DEMOGRAPHY

TASKS OF VOCATIONAL AND TECHNICAL EDUCATION DELINEATED

Moscow PROFESSIONAL'NO-TEKHNICHESKOYE OBRAZOVANIYE in Russian No 6, Jun 79
pp 3-8

[Article by A. Bulgakov, chairman of the USSR State Committee for Vocational and Technical Education: "We Will Fulfill the Party's Plans"]

[Excerpt] The CC CPSU and Council of Ministers USSR decree on "Further improvement of the process of teaching and education for the pupils in the system of vocational and technical education" designates as a task of enormous political and national educational importance the supplying of young workers to the country's national economy.

In the context of a developed socialism there takes place a continuous growth of the role and importance of the working class in the social and economic life of the country. Also making an impact on the development of this role is the system of vocational and technical education which creates the principal productive force--the highly skilled workers who possess all the qualities necessary for the building of a communist society and for the management of its affairs.

We are several years removed from the historically important 25th CPSU Congress, which outlined the grandiose tasks of communist construction. For all the workers of the country, including the workers of the vocational and technical school, these years were a period of great successes in all the sectors of economic and cultural construction. Bestriding the country with confidence is the 10th Five-Year Plan. On its banner is the party call--for efficiency and quality. Behind these meaningful words lies the intensive development of all the sectors of the national economy, the attainment of a high degree of productivity and production expertise, and the all-round utilization of the production reserves, the achievements of science and technology, and advanced experience.

Along with the problems of an economic and social character, the party congress defined the task of continued enhancement of the teaching and communist education for the younger generation and improvement of the structure and system of public education and its inseparable link--the trade

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and technical school, which is now functioning in the role of the main and leading instrumentality for the worker personnel. As was emphasized in L. I. Brezhnev's CC CPSU review report to the 25th Party Congress, "communist education entails a constant improvement of the system of public education and vocational training. This is especially important now in the context of the scientific-technical revolution. It imparts to labor a character which differs from the past and consequently also makes this impact on the preparation of the individual for labor."

In giving concrete form to this thesis and developing further the statement of principles prepared by the 24th CPSU Congress with respect to all-round enhancement of the role of the vocational and technical school in the general mechanism for the functioning of national production, the 25th Party Congress brought into play a qualitatively new problem: "to provide for the training of highly skilled workers coming from among the young people and destined for all the sectors of the national economy. This training, which will be given primarily in the vocational and technical educational institutions, will enable the young people to obtain at the same time a specialty and a general secondary education; this program will be offered in the secondary schools."

The essentially new feature in this is the fact that the vocational and technical schools must now prepare not simply skilled workers, as it did before, but young workers of great skill. This necessitates increasing more than two-fold the acceptance of young people in the secondary and technical schools during the years of the 10th Five-Year Plan. The Congress also set up high standards for improvement of the teaching and educational process in the vocational and technical school.

In full accord with the policy mapped out by the 25th CPSU Congress, the Party Central Committee and the Council of Ministers USSR on 30 August 1977 adopted a decree on "Further improvement of the process of instruction and education for the pupils in the system of vocational and technical education." This document represents a consistent continuation of the previous party and government developmental decrees on the vocational and technical school and it defines both the new tasks of the near future and the policy line for all-round development of the system in the future.

The growing maturity of Soviet society has engendered a steady growth also of the maturity of the state system of vocational education and, thanks to the unflagging concern of the party, it has launched a qualitatively new stage of its development. Vocational education has today become the basic school for the training of skilled workers. In this respect there is a fundamental and qualitative difference as compared to the role it played in the previous stages of the building of socialism. Indeed, in just three years of the 10th Five-Year Plan there has been a 4.3 million increase in the number of people in the country's working class and during these years the schools trained more than 6.6 million young workers. In the 10th Five-Year Plan the schools should train a total of approximately 11 million

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skilled workers. These figures give a fairly complete description of the ever growing role of the vocational education system in the maintenance of the size of the working class and they indicate that the vocational and technical school is equipped to fulfill even more complex and more extensive tasks.

Recent years have seen significant changes in the structure and composition of the schools for vocational and technical education. In the period from 1969 to 1979 the network of these schools has increased by more than one-third and it has now reached the figure of nearly 6,900 schools, the vocational and technical education of young people is developing at rapid rates in a number of Union republics. Thus, for example, in the current five-year plan alone training of skilled workers encompasses more than Uzbek SSR and Armenian SSR had in all the 20 postwar years--a 1.4-fold increase while Azerbaydzhan SSR and Kirgiz SSR had a 1.2-fold increase.

The number of students in the vocational and technical schools is increasing at ever more rapid rates. In the period of the same five-year plan the number of them has increased nearly 1.5-fold and it now comprises 3.5 million students.

We may regard as a basic result of the current decade the conversion of the system to the status of the main path of secondary vocational and technical education. This year marks the passage of only 10 years since the inception of the first PTU [vocational and technical school] and today nearly 1.2 million young men and women are studying in these schools. The network of technical schools is growing. The party has set the task of seeing to it that in the next few years the majority of the young people who are graduated from the secondary general education school and assigned to the sphere of physical production obtain a working vocation in the technical schools.

The level planned for attainment by 1980--to bring the proportion of secondary and technical school pupils to 90 percent of the day-school population--will undoubtedly be fulfilled. The Georgian, Lithuanian, Moldavian and Estonian Union republics have already practically completed the transition to the training of workers exclusively with secondary education.

Stepping up the Effectiveness and Quality of the Educational Work

The vocational and technical schools are making an important contribution to the enrichment of the intellectual potential of our society and to the acceleration of scientific-technical and social-economic progress. This form of training of worker personnel is the direction of the future because it enables us to successfully accomplish the great social tasks assigned by the party--elimination of the substantial differences between physical and mental labor and between the city and the village and the shaping of thoroughly and harmoniously developed people who have a high

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ideological-political and cultural-technical level and possess vocational mobility and stability, a capacity for creative activity, independence, and civic consciousness and maturity. The party teaches us that national production efficiency is in many respects determined by the level of the vocational training given to the workers engaged in this production because their knowledge, translated into the aggregate of labor, becomes an ever more substantial part of the wealth of our society. These policies today also define the concepts of "efficiency" and "quality" in relation to the activity of the vocational and technical schools and in relation to the content of pedagogical labor in general.

The process of improving the quality of the training of the young workers is closely bound up with all-round improvement of the work of the secondary PTU's as the leading educational institutions of the system. In light of the requirements of the 30 August 1977 decree of CC CPSU and Council of Ministers USSR, beginning with the 1978/79 academic year the vocational and technical secondary schools have adopted training of highly skilled workers in accordance with the new academic plans and programs, which, irrespective of the vocation aimed at, provide for a single level of general secondary education as well as political ideological, labor and moral training. These schools have had a great deal of success in resolving such important problems as the introduction of a new list of occupations, the grouping of related occupations, the reduction of the pupils' weekly study load to bring it down to 36 hours, improvement of the organization of instruction, especially in the period of production practice work, and making broad provision for the continuity and coordination of the vocational, technical and general education training. We have also completed the preparation of study plans for the technical schools.

In the prior years of the 10th Five-Year Plan the teaching collectives of most of the educational institutions did a great deal to bolster the depth and solidity of the knowledge and the capacities and skills of the pupils, to intensify the ideological education orientation of the teaching process, and to increase the effectiveness of the pedagogical labor. Of the 1978 graduates 17 percent of the pupils obtained a higher grade on the job. The instructional plans and programs are being successfully fulfilled in most of the vocational and technical educational institutions. We have achieved improvement of the quality indicators for pupil progress in production training and in the subjects in the vocational and technical series. The highest quality indicators are being achieved in the secondary and technical schools of RSFSR, UkrSSR, BSSR [Belorussian SSR] and Moldavia.

At the same time, there has been practically no change in the number of secondary PTU graduates receiving diplomas with honors. A considerable number of the pupils studying the general education subjects are progressing only at the satisfactory level. This is due to the inadequate methodological training of many of the teachers, the lack of systematic organized individual work with the pupils, the tendency to underestimate the importance of

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the correct organization of in-school control, and the unsatisfactory effectiveness of the work for the introduction of advanced experience.

We must see to it that the lessons in all the subjects are supported by the scientific validity of the instruction, that the teaching process is consistently incorporating instruction which develops, educates and moulds, and that every teacher and supervisor directs the perceptive activity of the pupils, their training in rational ways of thinking, and the development of memory, attention, powers of observation, labor expertise, and skill in the creative use of the acquired knowledge. And this should be achieved not just through the traditional methods but also through the new, progressive methods of instruction and the active development in the pupils of habits of independent work.

The vocational and technical educational institutions are achieving continued development of the instrumentalities which are significantly escalating the level of pedagogical capability for theoretical instruction and improving the methods of implementing intersubject relationships, the problem and program instruction, the practical laboratory and computation planning work, microelectronic engineering, the video tape recorders, the graphical projectors (coders), and the other technical instruction facilities.

There is need to focus considerably more attention on the instruction and education for young people in the technical schools, this work to be structured on the basis of the age group characteristics and the general education training. It is also required in these undertakings to make extensive use of lectures, seminar classes, and independent work by the pupils with technical and reference literature, synopses, technical conferences, etc. It is necessary to activate All-Union and republic unified control projects and to prepare standardized examination papers in the specialized and general education subjects for the most populous occupations.

The most important task for the next few years is to make comprehensive and systematic provision for instructional and programming documents, textbooks, visual teaching and methodological aids, film apparatus, and instructional materials. This is a vast field of activity for the VNMTs [All-Union Scientific Methods Center] and the VNII [All-Union Scientific Research Institute] for vocational and technical education, the All-Union trust for production enterprises, and the methods subdivisions of the system. The need has now arisen for the development of the work of providing methods on a comprehensive scale for the process of training for the leading occupations.

In the recent period the State Committee has made a special point of drawing the attention of the vocational education organs and the schools to the matter of improvement of the production instruction for the pupils. A new statute was prepared in reference to the production training foreman and a

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list of the complex occupations was approved. In 1978 we held eight All-Union competitions for pupil vocational proficiency.

We can cite quite a number of examples of successful creative work by the pedagogical collectives. There is the order-decorated GPTU [State Vocational and Technical School] No 17 in the city of Frunze, which has a full production series for sewn articles and shoes going from the training workshops to the counters of the stores, GPTU No 33 in the city of Kazan', No 11 in Tashkent, No 74 in Zhdanov, No 3 in Ul'yanovsk, where the construction specialists are permitting the pupils to go ahead on their own with the construction of industrial installations and residential buildings, GPTU No 22, 26 and 49 in Moscow Oblast, where the pupils are being trained in the production of intricate output by the method of defect-free manufacture of products, and others.

It is necessary, jointly with the industry ministries and departments and the base enterprises, to take all possible measures to step up the level of production training and production practice, and to recruit outstanding production specialists, instructors and workers. It is important to maintain constant communications with the school graduates and, particularly in the first months following graduation, to listen carefully to the criticisms voiced by the workers and the supervisors of the shops and services of the enterprises with regard to the quality of the training of the young workers, and from these criticisms and suggestions draw proper conclusions and devise practical measures for improvement of the training process.

A good example of this is the work being done with school graduates at the Noril'sk mining and metallurgical combine imeni A. Zavenyagin. There the training for the hiring of PTU graduates is being carried out on a systematic basis throughout the academic year. Meetings are organized with the pupils in the graduating groups and their parents and they are given the opportunity to familiarize themselves with the brigade collectives at the place where they will work. They are shown the working places and each graduate concludes a comradesly agreement with a tutor. The result is that all the newcomers are employed in a specialty and are given job grades; this has put an end to the turnover of recent PTU graduates.

However, one also comes up against instances of a callous and bureaucratic attitude on the part of some of the enterprise managers toward the young workers who have graduated from a school. The vocational and technical education organs must be relentless in combatting instances of this kind.

On the Basis of a Comprehensive Approach

Concern for the future of the rising generation pervades every line of the new CPSU Central Committee decree on "Further improvement of the ideological and political education work." This decree declares: "The heart of the ideological and political education work was and is the development in the Soviet people of a scientific world outlook, a selfless devotion to the

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"party cause and the communist ideals, and a love for the socialist homeland and proletarian internationalism." This most important doctrine must pervade the entire content of the training and educational work with the objective of producing a new type of production worker in our educational institutions.

The accomplishment of this task requires from the vocational and technical education organs and the teaching collectives further improvement of all the activity on the basis of a comprehensive approach and an organic unity of the training and educational process.

This means primarily further improvement of the teaching of the social disciplines and maximum enlistment of the world outlook functions of the general and specialized subjects. There must also be an intensification of the work of study by the pupils of the Leninist theoretical legacy, the documents of the CPSU and the Soviet government, and the reports and speeches of General Secretary and Chairman of the Presidium of Supreme Soviet USSR Comrade L. I. Brezhnev; also, an intensification of the work of indoctrinating the young generation of workers in the revolutionary, combat and labor traditions of the Soviet people. Last year the vocational and technical education institutions went over to the new program and textbooks for the social disciplines, programs and textbooks which were prepared in light of the decisions of the 25th CPSU Congress and the new USSR Constitution. Important work has also been done to improve the economic education and training of the pupils.

In the process of teaching the principles of labor and production economics and political economy and in the extracurricular work in these fields the future workers are inspired to labor honorably and conscientiously for the good of the motherland, to make skillful use of the economic knowledge they acquired in practical work, to fulfill the established production norms without any defective output, and to make efficient use of the working time. It behooves us to improve the education of the young men and women in a spirit of thriftiness and a careful attitude not only toward the textbooks, the school property and classroom equipment, and the expenditure of materials and electric energy but also toward the school clothing. There is need also to teach them how to spend wisely the money earned in the process of production on-the-job training.

In familiarizing the pupils with the content of scientific principles and the role and significance of the new USSR Constitution it is necessary to do a consistent job of preparing the future young workers for fulfillment of their civic duty to the motherland. An important event in improvement of the ideological and political education of the pupils was the publication of Comrade L. I. Brezhnev's books "Malaya Zemlya [small land]," and "Tselina [The Virgin Land]"--vivid historical documents on the military and labor exploits of the Soviet people.

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Most directly related to the development of profound ideological convictions is the problem of labor education. In the vocational and technical educational institutions labor education is basic to the production training and practice of the pupils, to their technical creative work studies, and to their inventive and rationalization endeavors. In 1978 alone the PTU workers and pupils submitted more than 17,500 nationalization suggestions, the overwhelming majority of which were adopted for implementation with a tentative economic effect of more than 2.5 million rubles. More than 900,000 persons have taken an active part in the groups performing creative technical work.

The workers and pupils of the vocational and technical education system received with great satisfaction the information that on the basis of the results of the 1978 All-Union socialist competition the challenge Red Banners of the CPSU Central Committee, Council of Ministers USSR, AUCCTU, and CC of the Komsomol were awarded to the collectives of rural vocational and technical school No 10 in Khersonskaya Oblast, UkrSSR and technical school No 9 in the city of Yerevan. The collectives of the educational institutions of Georgian SSR, Moldavian SSR and 13 administrations for the first time won the challenge Red Banners of Gosprofobra [State Committee for Vocational and Technical Education] USSR and the Central Committee of the trade union of workers of the state institutions.

The Pedagogical Personnel and Improvement of their Proficiency

Implementation of the plans for development of the vocational and technical education and the quality of the training and education of the pupils will to a decisive degree depend on the supervisory and engineer pedagogical personnel, on improvement of their training and advanced training, and on a steady improvement of the quality of the personnel.

At the present time there are at work in the vocational and technical education system more than 300,000 persons, including 145,000 production training foremen and nearly 130,000 instructors, tutors and physical education supervisors. Of the engineer pedagogical workers 90 percent are graduate specialists. During 1978 assignment to the schools included about 17,000 young teachers who had graduated from higher and secondary technical schools and more than 10,000 specialists from the base enterprises and teachers from the general education schools.

However, it would be incorrect to draw the conclusion that we have fully resolved the personnel problem and have supplied the schools with the specialists needed to meet the present-day requirements. Some engineer pedagogical workers still do not have the necessary education, adequate production skills, and vocational expertise. We are seeing a large turnover of personnel, particularly foremen, and we are not showing the proper concern for the young specialists. The task facing us is to implement measures in the near future for enlarging the training of the engineer teachers, to organize a gradual transition to the training of production

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instruction foremen with higher education, to take measures aimed at having the industry pedagogical tekhnikums offer a broadly diversified training for combinations of occupations, and, finally, to raise the level of the graduates of vocational and technical schools to the point where it approximates the level of the graduates of the pedagogical VUZ's.

Under the conditions of the scientific-technical revolution and the exceptionally extensive flow of scientific-technical data, one of the pressing problems is the need for systematic escalation of the skills of the engineer pedagogical personnel. For this purpose we have established a broad network of diverse institutions--an All-Union institute for advanced training of vocational and technical education supervisors and specialists, the branches of this institute, and courses, seminars and departments. Gosprofobr is planning to carry out considerable expansion and strengthening of the educational and physical production base of the All-Union institute, to make it the future scientific methods center in this oblast, to establish new republic and interoblast advanced training institutes, to raise the scientific level of the refresher training, and to step up its effectiveness and quality.

The pedagogical practice work must be strengthened by the vigorous scientific activity of our scientific institutions: the VNII for Vocational and Technical Education, the Kazan' NII [Scientific Research Institute] of Vocational and Technical Pedagogy, the Department of the Pedagogy and Psychology of Vocational and Technical Education of the Academy of Pedagogical Sciences USSR, the VNM [All-Union Scientific Methods] Center, and coordination of the scientific research with the industry scientific institutions. The measures taken will enable us to develop the high-powered potential in the vocational and technical education system and to achieve a genuine expansion of the scientific pedagogical work in the realm of the vocational and technical school.

The most important requirement for the progress of the system of vocational and technical education is further strengthening of the academic and physical base of the educational institutions. The ministries and departments have adopted the appropriate orders and decisions of the boards. As before, there is a pressing problem entailed in supplying the schools with modern machine tools and other types of equipment and instruments. The matter of joint work of the schools and the base enterprises has not been fully resolved. Because of this, the Gosprofobr USSR is now preparing a statute on the base enterprise.

The ministries and base enterprises must jointly review and approve new norms for equipping study halls, laboratories and workshops and within the next few years they must complete the development of these norms for each of the occupations for which they are offering training.

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In the future economic development of the country a major role has been acquired by the large national economic and social programs planned by the party; the implementation of these requires a large number of highly skilled workers. In this regard we should mention first of all the plans for development of the agriculture of the nonchernozem zone of RSFSR and for the rapid economic development of Siberia and the Far East; also, the intersectorial programs for the establishment of territorial industrial and agrarian complexes.

In addition to the territorial aspect of the planning, great importance also attaches to the sectorial aspect. In keeping with the consistent party policy aimed at development of the industries which determine technical progress, we have recently expanded the network of schools and strengthened their base, particularly in ferrous metallurgy, the chemical and coal industry, and machine building.

According to the Ministry of Agriculture, 4 million machine operators are currently employed in the rural localities and this number should be doubled in the near future. On this basis our task is to establish a rural secondary vocational and technical school or technical school in every large agricultural region, to organize in these schools the training of personnel whose work would assume the distinct features of industrial labor, to fully resolve by the end of 1980 the matter of establishing training organizations in the rural vocational and technical schools, and to make every rural school a model cultural and technical center.

At the beginning of this year the CPSU Central Committee and the Council of Ministers USSR adopted a decree on "Measures for further improvement of the training of skilled personnel and assigning them in construction." This decree delineated for the remaining two years of the five-year plan the intention to train more than 600,000 young construction workers in the PTU's. The appropriate ministries and departments have issued authorizations for strengthening the educational and economic base of the vocational and technical schools. For the 1979-1980 period assignments were set up for the construction of new training institutions. It was stipulated that these installations were to be put into operation in a complex with workshops, proving grounds, and public service buildings and residential facilities. To improve the quality of the pupils' training it was suggested that the staffing of the school be carried out in collaboration with the base construction and installation organizations.

Jointly with the Goskomtruda [State Committee for Labor] and the AUCCTU, Gosprofobr USSR in 1978 reviewed the list of occupations, which included new specialities. The occupations with broad specialization already comprise more than one-third of the list and the group of occupations for girls has been enlarged. The vocational and technical education system has been rightly criticized for the inadequacy of its training of young workers for trade, public dining, and municipal and everyday service

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enterprises, where female labor predominates. We have a large potential for attracting girls to the PTU's, particularly in the rural localities, and this potential should be exploited.

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MANPOWER: LABOR, EDUCATION, DEMOGRAPHY

SHIFTS IN TYPES OF LABOR AVAILABLE IN RURAL AREAS

Moscow VOPROSY EKONOMIKI in Russian No 8, Aug 79 pp 66-74

[Article by T. Kuznetsova]

[Text] The July (1978) CPSU Central Committee Plenum indicated the necessity of "multiplying efforts on solving the tasks of drawing urban and rural material and cultural-personal living conditions closer to one another." One such task is drawing the structure of urban and rural spheres of labor application closer together. In the type of social division of labor which has evolved between the city and the countryside, the latter is characterized by a relatively limited choice of spheres of labor application as compared with the city and by the socioeconomic features of agrarian labor itself. Specific occupational-skills, socioeconomic and demographic structures of workers have been formed in rural areas.

Spheres of labor application are understood to mean types of activity and production and nonproduction subdivisions created by social division of labor as viewed in terms of the aggregate of material-substantive and socioeconomic working conditions and labor resources requirements. The structure of the spheres of labor application coincides with the structure of the production and nonproduction spheres of the national economy. Spheres of labor application are characterized by the conditions of people's social-production activity, the opportunities for choosing a type of such activity, and the distribution of labor resources in the social division of labor system.

At present, meeting people's needs for appropriate types of labor activity is playing an ever-increasing role from the viewpoint of interest in labor, increasing labor effectiveness, preventing personnel turnover, and so on. As the material and technical base grows and is strengthened, the USSR Constitution notes, conditions are created for all laborers to actualize not only their right to labor, but also their right "to choose an occupation, kind of employment and job in accordance with their calling, abilities, occupational training, education, and with consideration of social needs" (p 40).

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The socioeconomic equality of all laborers in socialist society -- providing all those able to work with work, drawing them into social production, and so on -- is realized through the system of spheres of application of labor which has evolved. At the same time, socioeconomic differences in the social status of people, nonuniformity in the use of production conditions resulting from the present level of development of productive forces, are expressed in the spheres of labor application. Within a unified national economy, the spheres of labor application in urban and rural areas are a unified complex whose parts move in an interrelated manner and which is as a whole subordinated to general laws, although each of these parts has its own socioeconomic specifics and its own direction of development.

The general patterns of development of the spheres of urban and rural labor application are characterized, first, by the generation of new types of activity; second, by improvement in working conditions in existing types of activity; third, by the growth of labor resources between different spheres of labor application under the influence of scientific and technical progress, labor productivity growth, and other factors. The socioeconomic specifics of the spheres of labor application in rural areas as compared to urban ones are expressed in a lower level of development of both the productive and the nonproductive sphere; in features of their structures resulting from the predominance of agriculture; in the distinction between agrarian and industrial labor; in the existence of a specific sphere of labor application -- the private subsidiary farm -- more typical of rural areas than of urban areas, and others.

Branches determining technical progress and using a more skilled workforce, more complex equipment and, consequently, providing workers with better working conditions, are concentrated in urban territories. In rural areas, the basic sphere of labor application is agricultural production, in part, processing branches and branches servicing agriculture, as well as branches and production not associated with agriculture but using local resources.

Investments in the urban and rural production spheres of labor application can be compared with a certain degree of approximation. In 1940, capital investments per person employed in industry exceeded similar capital investments in agriculture 7.5-fold; in 1965, that difference was 2.2-fold, and in 1977 -- 1.1-fold. In the last 10 years, growth rates in capital investments in agricultural production per person employed in it have been higher than in industry. The indicated differences in amounts of capital investment have been reflected in the status of the spheres of urban and rural labor application and have determined the material-technical and socioeconomic specifics of the latter. The concentration of skilled personnel and the bulk of the material and financial resources in the cities has facilitated not only developing branches with a high level of production in them, but also broadening the range of those branches. The level of development of nonproduction branches in rural areas is lower than in cities. In terms of number of workers employed, branches of the production sphere in rural areas considerably exceed branches of public services.

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The number of workers in the basic branches of public service differs substantially in urban and rural areas, although urban and rural areas are observed to be drawing closer to one another in this regard.

Relationship of Number of Workers Employed in Cities to Number of Workers Employed in Rural Areas, per 10,000 residents

	1965	1970	1975
trade	3.6	3.5	3.0
housing and municipal services	9.9	10.5	8.9
education, culture	1.4	1.4	1.4
public health	3.0	3.0	2.4
communications	7.3	5.7	4.1
transport	10.4	9.0	7.4
construction	4.5	3.7	3.2

The features of the branch structure and level of development of spheres of labor application in the countryside are supplemented by the specifics of their social forms. Different forms of socialist ownership presuppose different sources of developing labor application spheres. This determines in significant measure their differentiation in terms of level of development and working conditions, which relates first of all to agriculture itself. Data on the structure of agricultural production by farm category testify to the differences between them in terms of the availability of capital to labor and labor productivity.

Structure of Agricultural Production by Farm Category in 1977 (in percent)

	gross agricul- tural output	fixed agricul- tural produc- tion	average an- nual number of workers employed in agriculture
all agricultural production	100	100	100
including:			
social production	74.4	94.1	86.3
kolkhozes	37.7	43.3	50.0
sovkhozes	34.7	49.0	35.2
interfarm agricultural enterprises	2.0	1.8	1.1
private subsidiary farming*	25.6	5.9	13.7

*When examining the production structure in private subsidiary farming, consideration should be given to the assistance given it by social production.

One important indicator describing the features of the spheres of labor application is the power available to it. It is 2.3-fold higher at interfarm

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agricultural enterprises than on kolkhozes and 1.35-fold higher than on sovkhoses. Let's look at the level of mechanization of the most labor-intensive processes, specifically, at stockraising farms. The least complicated operation (supplying water) on hog and cattle farms nearly coincides in terms of level of mechanization on kolkhozes, sovkhoses and interfarm enterprises, 80-90 percent. The more complex operation of supplying feed is 26-30 percent mechanized on cattle-raising sovkhoses and kolkhozes, 56-62 percent mechanized on hog-raising farms, and at interfarm enterprises it is 78 percent mechanized in the first instance and 85 percent in the second; cleaning manure out of premises is 55-57 percent mechanized on cattle farms and 80 percent mechanized on hog-raising farms on the kolkhozes and sovkhoses, and 81 and 86 percent mechanized at interfarm enterprises. Naturally, working conditions are better and more highly skilled labor is used at enterprises with a higher level of collectivization, specialization and concentration of production. This is borne out by the proportion of machine operators among all workers in each type of farm. In 1977, it was 14.6 percent on kolkhozes, 17.2 percent on sovkhoses and 30 percent at interfarm agricultural enterprises. At the same time, kolkhozes account for 52.3 percent of the machine operators, sovkhoses for 46.4 percent, and interfarm enterprises for 1.3 percent.

The spheres of labor application in the countryside are considerably more regionally-specific than in urban areas. Thus, the forms and types of the spheres of labor application are considerably more diverse in rural regions with a developed system of roads, a dense network of settlements near large cities. In relatively undeveloped regions with a low population density and occupying large areas in which population centers are relatively rare, the spheres of labor application are generally specific and limited. There are regions with a high population increment, ones with little population mobility, and ones in which the population is redistributing intensively and flowing out, which also influences development of the spheres of labor application. The spheres of labor application and the number of workers are closely interrelated. On the one hand, the spheres of labor application must correspond to the amount of labor resources and ensure that they will be used. On the other hand, the spheres of labor application themselves, their composition, scope and structure, largely determine the number of workers of a given region, the size and composition of the population in it.

The resettlement system has a great influence on development of the regions and the spheres of labor application in them. Naturally, the larger settlements create broad opportunities for workers to choose a sphere of labor application. However, the developed road and transport lines, called the "vital arteries of the countryside" at the July (1978) CPSU Central Committee Plenum, which link rural settlements with each other and with the larger centers and which expand the choice of spheres of labor application for rural residents could be an alternative in this particular case. Also important in this instance is the role of each settlement comprising a particular region. An optimum combination of the functions of individual settlements within a region also facilitates improving the spheres of labor application.

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The worker structure¹ gives us an idea, although incomplete, of the specifics of urban and rural spheres of labor application as a whole.

Structure of Workers Employed in Urban and Rural Branches of the National Economy in 1975 (in percent)

	total	city	country-side	proportion of rural workers in total employed in the national economy
average annual number of workers in the national economy	100	100	100	35.1
including:				
in branches of the productive sphere	70.8	65.2	81.3	40.3
among them:				
in agriculture	23.5	1.6	63.8	95.4
in branches of social production	26.8	31.9	17.5	22.9
among them:				
in social and cultural services	16.2	18.2	12.5	27.2
in trade and personal services	10.6	13.7	5.0	16.3
in other branches	2.4	2.9	1.2	29.1

Under present conditions, the countryside's proportion of all workers employed in the national economy barely exceeds 35 percent and is tending to decrease. Workers in rural areas are employed basically at agricultural labor, and they account for nearly 64 percent of all rural workers, 53 percent being employed in social production and upwards of 10 percent in private subsidiary farming.

Contemporary processes occurring in urban and rural spheres of labor application are ambiguous. On the one hand, spheres of labor application are expanding faster in the cities than in rural areas.² On the other, prerequisites are being created for the process of drawing together the structure of these spheres in terms of their basic elements. Such prerequisites are, first, a rise in the level of development of all production branches existing in rural areas, with a trend towards increasing the share of nonproduction branches; second, the planned drawing together of the set of several branches of the production and nonproduction spheres (under a consolidated classification) located in both urban and rural areas; third, change in the ratio of production to nonproduction branches in favor of the latter in the structure of rural workers.

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1. The worker structure does not describe the level of development of spheres of labor application, working conditions, availability of labor to different branches, and so on.
 2. Rates of expansion of urban spheres of labor application exceed rural ones six-fold (in terms of number of workers, without considering agricultural production).

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The following basic directions of improving and expanding spheres of labor application are presently developing in rural areas: the industrialization of agriculture, agroindustrial integration and associated processes of drawing the two forms of socialist property closer to one another; expanding branches of agricultural production servicing in rural areas; the gradual concentration of branches processing agricultural output in rural areas¹; increasing opportunities for siting a number of subdivisions of branches not associated with the national-economic APK [agroindustrial complex] in rural areas; developing the rural construction industry; developing the infrastructure; expanding recreation zones and spots (sanatoria, recreation palaces, tourist centers, dispensaries, boarding houses, organizing recreation right in the villages, and so forth); creating an ecological service in rural areas. The resolutions of the July and November (1978) CPSU Central Committee plenums emphasized the necessity of developing the construction of rural roads, improving services to the rural population, and so on.

National, ethnographic, regional and historical features have a definite influence on developing spheres of labor application. Several of them facilitate, for example, the development of various kinds of handicraft industries, and so forth. In many regions of the country, such development is encouraged and stimulated, inasmuch as it not only lessens the seasonal nature of labor in rural areas, but also opens up opportunities for actualizing the needs of a certain segment of the rural population for creative types of activity.

Changes in the rural production sphere and advances in nonproduction branches are reflected ambiguously in the volume and structure of rural spheres of labor application. On the whole, the number of workers in rural areas is now decreasing. However, that decrease will probably be slowed, inasmuch as development of the spheres of labor application is largely compensating for the reduction in the number of agricultural workers by increasing the number of workers in other branches (the process of increasing those numbers has already begun in a number of nonagricultural branches in rural areas).

Increasing the scope of enterprises of APK spheres I and III in rural areas, integrating a considerable portion of them with agricultural production and putting agricultural output processing branches closer to raw material sources, introducing new technologies, measures to smooth out the seasonal nature of labor in rural areas, and so forth, will call forth qualitative changes in working conditions in these branches and, at certain stages, growth in the numbers of workers employed in them.

At present, specialized branches and productions are being separated from the agricultural sphere and developed on an interfarm basis, with a higher material and technical level than subsidiary shops and enterprises of kol-khozes and sovkhozes. For example, from 1970 through 1977, the number of

1. Many reserves are available for expanding these branches in rural areas: the number of workers at enterprises processing agricultural output and living in villages is less than one-fifth of all workers in this sphere of the APK.

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interfarm mixed feed enterprises increased 5.5-fold, the number of interfarm enterprises for processing agricultural output increased from 14,000 to 37,000, and the number of agricultural livestock artificial insemination stations nearly quadrupled. This process facilitates overcoming the isolation of agricultural production and raising the level of its collectivization. The integration of agricultural enterprises with enterprises servicing agriculture and processing its output is being expanded, and single enterprises shaping the integral primary links of the national-economic APK are being created. In the Moldavian SSR, the number of workers employed at such enterprises and encompassing only the state sector increased 1.8-fold from 1970 through 1976.

Until quite recently, and even today, the low level of specialization of APK branches and enterprises in rural areas has permitted the same people to perform a wide range of jobs in producing all types of agricultural output, processing it, and servicing agriculture. Moreover, seasonal workers drawn into agricultural work and low-skilled from the viewpoint of agricultural production are coping with this. Therefore, improving the spheres of labor application in rural areas assumes not only expansion of the range of specific types of labor, but also a qualitatively new level of such labor for rural workers.

In some measure, labor in branches of material production not associated with producing agricultural output meets these conditions. Depending on regional features, these particular branches are represented by various enterprises and associations in the countryside. The basic ones are industrial combines producing consumer goods, timber procurement establishments, motor vehicle enterprises, various transport services enterprises, construction organizations, lumber combines, branches of city industrial enterprises, enterprises of the building materials industry, and others. In many of them, working conditions are better and the level of industrialization is higher than in agriculture (availability of capital to labor is 1.5-fold higher). These enterprises and associations differ from agricultural ones in their higher level of collectivization, specialization and concentration of production. They have broad opportunities for influencing the living conditions of their workers by creating medical treatment, children's and sports institutions, public catering enterprises, municipal, personal, cultural and educational services, and so forth, and the level of services at many of them is higher than in analogous kolkhoz and sovkhoz enterprises.

With the development of these production facilities, not only are the spheres of labor application in rural areas expanded, but the socioeconomic working and living conditions of rural workers are also improved. Therefore, the resources of material production branches being developed in rural areas and not part of the APK's must be used more than they are now for socioeconomic transformations in rural areas. However, it should be noted that as a whole, these branches still lag considerably behind the level of economic development of similar branches and production facilities in cities, and especially in production and housing construction. The July (1978) CPSU Central Committee Plenum pointed out the necessity of working out concrete long-range

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measures "to improve all organization of production, housing, cultural- and personal-services construction in the countryside, the funds for these purposes having been increased."

New enterprises of material production branches not connected with the national-economic agroindustrial complex are being created in rural areas and existing ones are being expanded and renovated, and we plan to take a number of enterprises and their branches out beyond the large cities. The siting of industrial enterprises in small cities has a substantial influence on the status and development of rural areas, given the development of transport. At the July (1978) CPSU Central Committee Plenum, the development of road construction was linked both to further development of agricultural production and to raising the standard of living of the rural population. Development of the network of roads in rural areas will facilitate expanding the spheres of labor application of their residents.

All these trends testify to the necessity of an overall approach to improving the urban and rural production sphere. Raising the level of development and changing the structure of the rural production sphere, the processes of agricultural industrialization and agroindustrial integration determine the basic trends of advances in the social forms of spheres of labor application in rural areas. The most important of these trends is the drawing together and development of the two forms of socialist property. Development of interfarm ties on a base of integration and cooperation, intensifying the process of transforming kolkhozes and sovkhoses into industrial-type enterprises facilitates further equalizing the economic conditions of managing enterprises related to the different forms of property, strengthening the material and technical base of agricultural production, overcoming the multibranch nature of agricultural enterprises, and so on. All this will permit eliminating such features of the agricultural sphere of labor application as interbranch differentiation of working conditions within enterprises and associations, which is currently manifested in very different directions: availability of equipment, worker skills, level of labor mechanization, and so on.

The development of industrial enterprise subsidiary farms is characteristic of the present stage. Their basic function is to meet the need for food products of the enterprise's workers, and to an extent also those of residents of the settlement where the industrial enterprise is located (especially if the industrial enterprise is in a rural area).

The level of equipment availability on subsidiary farms of industrial enterprises ordinarily meets the requirements of modern agricultural production, and they employ a full-time staff of workers. Basic production workers are drawn in on a large scale only during taut periods of agricultural work.

The more extensive creation of subsidiary farms at industrial enterprises in a number of the country's regions, especially in eastern ones where considerable numbers of city-dwellers are drawn into agricultural work, would facilitate growth in agricultural production through better labor organization and the use of industrial enterprise reserves.

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only on the amount of such funds, but also on how they are used. Currently, the lack of adequate organizational-economic and administrative ties between branches and enterprises leads to a scattering of funds. The low level of collectivization of a majority of the enterprises located in rural areas often causes a duplication of investments in similar production facilities and enterprises of both the production and nonproduction spheres. Kolkhozes, sovkhoses and state enterprises related to different ministries and departments and enterprises and services of the consumers' cooperative system have available to them certain funds which go to develop the spheres of labor application in the countryside and to develop rural areas in general. However, the lack of a unified program for developing urban and rural areas and the disconnected directions of capital investment lead to a scattering of material means and to their ineffective use.

The current branch approach and departmental discontinuity of enterprises and farms in rural areas and the absence of ties among them do not permit the comprehensive solution of production and social problems of overcoming differences between the city and the countryside. Under these conditions, nonagricultural branches, by appropriating some rural labor resources, influence social transformations in the countryside inadequately. Therefore, it is possible to solve problems associated with developing spheres of labor application in rural areas given the systematic actualization of the rights stated in the USSR Constitution of local organs of governmental authority and administration in rural areas, by which the Soviets of People's Deputies guide all branches of state, economic and sociocultural construction, approve economic and social development plans and the local budget, coordinate and supervise the activity of enterprises within the territory of the Soviets in the areas of land use, nature protection, construction, consumer goods production, sociocultural, personal and other services to the population.

Solving these problems will be facilitated by the integrational processes between industry and agriculture, as well as by combining the efforts of interfarm and agroindustrial associations and enterprises with enterprises and organizations of other departments for the purpose of improving working and living conditions for the rural population and developing rural areas as a whole. The materials of the 25th CPSU Congress note that: "The more dynamic the national economy and the more quickly its branch and territorial structure change, the more critical becomes the task of coordinating the development of material production and the nonproduction sphere with the availability of labor resources." Implementation of this task assumes systematic strengthening of the comprehensive development of the city and the countryside and an increasing weakening of their socioeconomic specifics.

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TRANSPORTATION

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CALCULATING CARGO FLEET TONNAGE RESERVES

Moscow TRUDY GOSUDARSTVENNOGO PROYEKTNO-IZYSKATEL'SKOGO I NAUCHNO-ISSLEDOVATEL'SKOGO INSTITUTA MORSKOGO TRANSPORTA in Russian No 48, 1977 pp 14-27

[Article by V. K. Lerner]

[Text] Concept and Classification of Reserves. With the rapid technical progress of today, social production is characterized by continued deepening of the division of labor process, by a high degree of specialization, and by an increasingly complex technical and economic structure. Strict proportionality in the development of individual branches of the economy is becoming increasingly necessary, and increasingly difficult to ensure. Even given the most perfect planning and the most precise management of the economy, disproportions resulting from numerous objective and subjective causes arise among its branches and subdivisions.

It is possible to ensure stability and smoothness in the process of social expanded reproduction only given the presence of reserves in all branches and links of the national economy.

Reserves are definite opportunities, resources, natural, financial and other reserves which are used for their intended purpose only when necessary. In the words of A. Ye. Probst, "any national economic plan, if deprived of reserves, loses all maneuverability and is transformed into a rigid, ossified and therefore lifeless scheme."¹

Eliminating disproportions in the development of individual branches of the economy through the use of reserves enables us to avoid considerable financial losses. However, the creation and maintenance of reserves, in turn, requires certain expenditures. Such levels of reserves as will allow minimal total losses due to a lack of reserves on the one hand and minimal expenditures on creating and maintaining them on the other should therefore be considered optimum.

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1. A. Ye. Probst "Importance of Reserves to National Economic Planning" in the book "Sovershenstvovaniye planirovaniya i upravleniya narodnym khoz-yaystvom" [Improving National Economic Planning and Management], Moscow, Izd-vo Nauka, 1976, pp 110-126.

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Determining optimum reserve amounts is one of the most important tasks of national economic planning and management.

Quite a bit of research has been done in this area in the Soviet Union and abroad. It has touched on various branches of the economy, including rail and river transport.

This is a very pressing problem for maritime transport, which plays a dominant role in foreign-trade shipments in the USSR. However, up until the early 1960's, the national economic demand for foreign trade shipments was not covered by the domestic fleet, forcing us to charter a large number of foreign ships. The creation of reserves was therefore very difficult. Subsequently, the maritime fleet tonnage grew rapidly, and its participation in foreign trade shipments increased accordingly. Whereas in 1961, Soviet ships accounted for only 36 percent of all export-import cargo shipped, by 1970 that share had reached 56.5 percent. In 1961, Soviet maritime fleet ships carried 54.1 percent of the cargo subject to delivery by the Soviet side, and in 1970 -- 95.2 percent.

In the absence of serious disturbances, this ratio has continued to the present.

Under these conditions, the problem of creating maritime transport reserves is entirely capable of solution.

It is known that transport output is completely absorbed during the production process. It cannot be accumulated, stored or, consequently, kept in reserve. Therefore, as applicable to transport, and to maritime transport in particular, one can speak basically of a reserve of production capacities, as for example, tonnage, warehouse space, auxiliary floating facilities, lift and transport machinery, and so on.

However, maritime transport activity is associated with a demand for the output of other branches of the economy, which generates the circulating capital for maritime transport. This includes fuel, lubricants, minor and non-durable equipment, and all manner of "house-keeping" items. In terms of its basic operating activity, circulating capital accounts for only three percent of all maritime transport capital. Nonetheless, the lack of a definite reserve of the former can and at times does lead to disruptions of fleet operation.

This article will not examine questions of establishing reserves of commodity stores. Therefore, while noting the unquestioned legitimacy of asking those questions, let us move on to an analysis of production capacity reserves.

Let us note first of all that production capacity reserves can be divided into the following groups: reserves for expanding production, planned capacity reserves, reserves due to imbalanced capacities, insurance reserves.

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Reserves for Expanding Production. These reserves are understood to mean stocks to build new production capacities: docks, spur tracks, ship's repair shops, and so on.

Planned Capacity Reserves. This group includes reserves to ensure stable operation of maritime transport.

It is known that operation of the maritime fleet is characterized by great unevenness resulting from the complex interaction of economic, political, weather and technical factors.

The basic economic reasons are: unanticipated trade deals, redistribution of cargo among the various types of transport, re-addressing cargo, and so on, and fluctuations in charter-ship market conditions.

The basic political reasons are: military operations in different regions of the globe, strikes in the ports of capitalist countries, increases or decreases in the volume of shipments to individual countries as a result of changes in political policies, and so forth.

The basic weather reasons are: seasonal operation (for portions of the sea which freeze fully or in part), weather conditions (delays due to storms, fog, torrential rain, and so forth).

The basic technical reasons are: delays in drawing up documents, temporary closings of ports or canals to perform maintenance, changes in navigable channels, and so on.

Reserves Due to Imbalanced Capacities. In studying the reserves of this group, it is appropriate to recall the "pyramids" principle formulated by S. M. Vishnev for examining problems of an optimum system of national economic reserves: "Analysis of interbranch balances shows that the sphere of material production can be divided up into blocks. It is necessary that the capacity reserves within the individual blocks be interdependent. At the same time, the branch blocks themselves can be ordered to form a kind of production 'pyramid' (or 'cone') with blocks of the raw material and energy branches as the base and the light industry block as the peak."

The block-hierarchical structure of the aggregate of branches of social production points to a logical path for a systematic process of creating adequate capacity reserves; it is appropriate to begin by broadening the base of the "pyramid."

In our task, the peak of the "pyramid" is the basic plan indicators for maritime transport operation for moving a specified amount of cargo in certain

1. S. M. Vishnev, "Problems of An Optimum System of National Economic Reserves," in the book "Ekonomika i matematicheskiye metody" [The Economy and Mathematical Methods], Vol 2, 3rd ed, Moscow, Izd-vo Nauka, 1966, pp 370-380.

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directions. The necessary fleet carrying capacity is calculated based on the amount of this work, as is tonnage. In this regard and with consideration of all coefficients (carrying capacity use, ballast run use, and so on) fleet carrying capacity must exceed cargo capacity by the size of the reserve. In turn, the throughput capacity of the ports must exceed adequate fleet carrying capacity by the size of the throughput capacity reserve.

The size of the reserve must grow as one moves from the peak of the "pyramid" to its base.

But whereas a shortage of fleet carrying capacity can in some measure be compensated for by chartering foreign tonnage, a shortage of port throughput capacity cannot be made up operationally, which unavoidably leads to disruption of the transport process.

It is known that the development of our maritime ports still lags behind fleet growth. This lag is manifested in significant nonproductive ship moorings in port, which comprise approximately 25 percent of all anchorage time. Nonproductive anchorage is equivalent to taking some ships out of operation. Thus, the imbalance of fleet and port capacities leads to losses of fleet carrying capacity and to large losses.

Capacities imbalance also occurs within ports. For example, a majority of the ports have no shortage of wharves. At the same time, they do not have enough warehouse facilities or enough of certain types of lift-transport machinery. The manpower deficit, which reduces maritime port throughput capacity, is especially acute.

Insurance Reserves In Case of Accident or Nonplanned Maintenance. Oceangoing ships are exposed to the risk of accidents while sailing and while at anchor in unprotected ports or roads. Moreover, a ship is a complicated, expensive piece of technical equipment in which the malfunctioning of a single unit, device or installation sometimes leads to long delays in the delivery of cargo and to large losses. The problem of providing the maritime fleet with reserves in case of accident is therefore very important.

The above enables us to indicate the basic, and in our view very pressing directions of research in the area of maritime transport reserves:

for the fleet: 1) tonnage reserves for cargo transport, passenger, auxiliary-service and technical fleets; 2) speed reserves; 3) container and barge reserves for container ships and transport barges; 4) crew reserves;

for ports: 1) mooring reserves; 2) warehouse reserves; 3) railroad track reserves; 4) reloading equipment reserves; 5) port fleet reserves; 6) port worker reserves;

in the material-technical supply system: 1) fuel and lubricants reserves; 2) reserves of minor and fast-wearing equipment, "house-keeping" supplies, and so on; 3) reserves of motor and other means of transport.

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In addition to the enumerated reserves, one should bear in mind those at ship's repair enterprises, as well as monetary (currency) reserves. The latter are especially important to maritime transport. Although a shortage of tonnage can be made up by chartering foreign vessels, it would be extremely unwise to count only on the international charter market and reject a reserve of our own in the form of additional fleet carrying capacity. Given such an approach, the activity of our own fleet would be made completely dependent on foreign ship-owners, which would enable them to dictate charter rates. This would lead to large unplanned expenditures of currency.

Of course, the above does not indicate a rejection of the chartering of foreign tonnage. But it must be chartered when that is to our advantage, for only in that instance will the result of chartering operations mean a savings rather than a loss.

In this article, only one of the problems needing research which has been indicated above is examined, that of cargo transport fleet tonnage reserves.

Maritime Fleet Carrying Capacity Reserves. The existing planning method anticipates a tonnage reserve.¹ In order to do this, factor K_p is introduced into the appropriate formula. However, neither its value nor the method of calculating it is defined.

In its calculations, the economic planning administration of the Ministry of the Maritime Fleet uses a five-percent adjustment in the five-year plan for tonnage not delivered from shipbuilding industry, and one percent in annual planning. However, this adjustment must not be viewed as a reserve, since it is used to calculate the basic fleet composition. It was already stated above that by reserve, we mean a certain excess of tonnage in case of unforeseen circumstances.

The factors requiring that the maritime fleet have a reserve of tonnage can be broken down into three groups:

- 1) specific and inherent to the operation of maritime transport itself;
- 2) those resulting from the needs of organizations using the services of maritime transport;
- 3) those due to causes which are international in nature.

First Group of Factors. The maritime fleet is influenced by various circumstances which reduce its carrying capacity. A majority of them are more or less systemic in nature and are therefore taken into account when drawing up plans.

However, unforeseen events which cannot be anticipated in advance sometimes affect fleet operation. They are set down only in reporting indicators which

1. "Metodicheskiye ukazaniya k sostavleniyu gosudarstvennogo plana razvitiya narodnogo khozyaystva SSSR" [Methods Instructions for Compiling the State Plan for USSR National Economic Development], Moscow, Izd-vo Ekonomika, 1974, 791 pages.

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reflect fleet operations in a previous period and cannot, of course, be taken into account when drawing up the new plan.

It is just these events which are looked at when calculating the reserves needed.

1. Force Majeure (accidents, loss of ships, diversion to rescue operations or towing, and so on). These factors are not considered when drawing up the plan, but statistics prove that the maritime fleet loses a certain portion of its carrying capacity each year due to them.

2. Heavy Ice. In some years, the harsh winters lead to losses of fleet carrying capacity due to difficult ice conditions in the Arctic and in non-freezing and partially-freezing seas. This factor is generally taken into account in plan indicators. However, in individual cases unexpected losses occur. For example, in the winter of 1971-1972, the fleet lost carrying capacity due to heavy ice in the usually non-freezing Black Sea.

3. Unexpected Accumulation of Ships in Ports. In drawing up the plan, planning organs take into account nonproductive anchorages of Soviet ships in ports, which we indicated above comprise about 25 percent of the anchorage time and result from the uneven nature of maritime fleet operation. However, in individual cases, idle time greatly exceeds the average used for that planning. Unexpected accumulations of ships in ports leads to "bottlenecks" and to large losses of fleet carrying capacity.

4. Failure to Meet Tonnage Delivery Schedules. An analysis of compliance with commercial tonnage delivery schedules for 1971-1972 revealed a large number of deviations from schedules. This occurred in considerable measure due to the reasons described in preceding points. However, even given the most precise, efficient management of the fleet, it is evidently impossible to achieve absolutely precise observance of ship movement schedules. The availability of reserve tonnage would enable us to reduce to a minimum deviations from the schedule, which is especially important to the fleet being used on regular lines. Strict meeting of schedules, agreements and tonnage delivery schedules not only prevents losses, but also strengthens the prestige of the ship-owner as a partner who conscientiously meets the obligations he assumes.

Second Group of Factors. This group includes factors influencing maritime transport activity through its clientele.

1. Unplanned Shipments. There have been large unplanned shipments: in 1967 (export cargo from the Baltic to Cuba, as well as re-export cargo from Canada and Mexico to Cuba); in the first half of 1970 and in 1971 (from Black Sea ports to Mediterranean ports); in 1972 (from Brazil, as well as from the Dominican Republic, Venezuela, Columbia and San Salvador). There were also unplanned shipments in 1963-1964 and 1974-1975. In all these and other instances, recourse had to be made to additional chartering, although reserve tonnage could have been used very effectively had it been available.

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Of course, it is inexpedient to hold in reserve tonnage capable of handling all unplanned shipments, including large ones, since it would be hard to keep in use in other years. And there is no need for such a large reserve. Practice has shown that if just 20-30 percent of the tonnage required for unplanned shipments is concentrated in the necessary direction at the very start, which is quite possible using a reserve, there will be no artificially higher charter rates in the corresponding market section.

Table 1. Actual Leasing of Ships Relative to the Plan, in percent

(1) Год	(2) Флот		(1) Год	(2) Флот	
	(3) сухогрузный	(4) нефтезаправ- очный		(3) сухогрузный	(4) нефтезаправ- очный
1956	80	75	1964	108	63
1957	105	33	1965	94	—
1958	121	106	1966	81	97
1959	75	327	1967	103	254
1960	119	140	1968	85	150
1961	77	63	1969	82	124
1962	95	31	1970	123	70
1963	92	111	1971	75	86
			1972	102	92

Key:

- | | |
|----------|--------------|
| 1. Year | 3. Dry cargo |
| 2. Fleet | 4. Bulk oil |

3. Unplanned Ship Leasing. It follows from Table 1 that the actual leasing requirements of outside organizations and ministries for Ministry of the Maritime Fleet ships often exceed the planned amounts. On average over a number of years, this excess has been 0.35 percent of the total number of tonnage-days in operation for the dry-cargo fleet and 0.65 percent for the liquid-cargo fleet. True, it also follows from this table that the picture was exactly the opposite for a number of other years, that is, the actual leasing of ships was less than planned. However, the seemingly "surplus" tonnage which developed was used, naturally, for planned shipments and could therefore not compensate for the shortage of tonnage in those years when the actual leasing of ships was higher than planned. Such compensation can be made only through a reserve. The Ministry of the Maritime Fleet has often been forced to refuse to lease ships to outside organizations. The presence of reserve tonnage would permit a reduction in or the complete elimination of the number of refusals.

Third Group of Factors. We include in this group political factors and those associated with fluctuations in charter market conditions.

1. Strikes in Foreign Ports. In the capitalist countries, port strikes have become a permanent phenomenon in connection with inflation and the deepening (especially in recent years) of crisis processes in the economy. Thus, 320 to 400 ships per day were delayed in British ports from 14 July through 2 August 1970 in connection with a strike by 47,000 dock-workers. The value

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of the cargo on-board these ships during the strike has been estimated at 500 million pounds sterling. Even larger strikes occurred in British ports in 1972. Large ship idle-time losses were recorded during strikes in ports in Italy, Japan and Holland (1972) and also in Canada.

Use of reserve tonnage could compensate to a certain extent for losses of carrying capacity caused by ships being delayed in foreign ports.

2. Carrying Capacity Losses Resulting from Closings of Canals, Ports, and so on. The large losses of fleet carrying capacity due to the closing of the Suez Canal in 1967 are widely known. Only in 1975 did the canal begin operating again. Ship carrying capacity losses were considerable in Vietnam from April 1972 through March 1973.

3. Events of a Political Nature. The Soviet Union, true to its international duty and to the interests of the world communist and workers' movement, constantly supports peoples insisting on their right to independence and social progress. In carrying out this policy, certain tasks are entrusted to the Soviet maritime fleet, which must be able to concentrate the necessary amount of tonnage in the needed directions without being dependent on fluctuations in the charter market. A typical example is the Soviet Union's breaking the economic blockade of the Republic of Cuba. USSR maritime transport played a large role in this. Whereas shipments on Cuban routes were inconsequential prior to 1960, they increased significantly in 1960. However, in this regard, more than half the cargo was shipped on foreign vessels. In 1961 and 1962, the shipments continued to grow rapidly, but the Soviet fleet's share remained as before. In 1963, it began to increase, and since 1965, practically all shipments on Cuban routes have been made by the Soviet fleet.

The shipments on a large scale by the Soviet fleet to Vietnam during the American aggression should also be remembered.

In order to carry out such shipments successfully, with minimal involvement by foreign tonnage, the maritime fleet needs a carrying capacity reserve.

4. High Charter Rates. An analysis of market conditions shows that a higher demand for tonnage is felt periodically in the charter market. During such periods (1947, 1951, 1956, 1967 and 1970, for example), charter rates increase, which creates good opportunities for exporting transport output.

On the basis of an analysis of fluctuations in charter rates and of change in the portfolio of orders and idle tonnage of the world transport fleet, the necessary maritime fleet carrying capacity reserve for years of favorable charter market conditions has been disclosed.

Calculating the Maritime Fleet Carrying Capacity Reserve. Reserve tonnage cannot be determined as an independent value. It can be calculated only in relation to the tonnage of the main fleet, which is taken as being optimum

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in this particular problem. Such an assumption is fully justified, inasmuch as the goal of the study is not to determine the total amount of maritime fleet tonnage, but to calculate a certain additional amount in the event of unanticipated economic, political, technical and accidental events as examined in the preceding section.

It is important to note that the above-enumerated factors generally do not operate simultaneously. Therefore, the total reserve for all factors over a number of years is less than the total reserves for individual factors.

The demand for additional fleet carrying capacity in terms of individual factors is illustrated in Table 2 [page following]. The line of totals in the table describes by year of the calculation period the needed reserve, R, of carrying capacity relative to the total Ministry of the Maritime Fleet fleet tonnage in percent.

As was noted at the start of the article, the optimum reserve should be taken to be that at which the total income lost, on the one hand, and expenditures on maintaining the reserve, on the other, are minimal over a number of years. Mathematically, this condition can be described as follows.

We must determine $\min [C_p(R) + C_R]$, (1)

where $C_p(R)$ is the income lost due to absence of a reserve;
 C_R is expenditures on maintaining reserve tonnage.

So, the task is to determine the optimum reserve tonnage amount using the criterion of minimum losses to maritime transport, losses being understood to mean not just direct expenditures on maintaining the reserve, but also income lost by not having it.

The calculation for lost income due to lack of reserve dry-cargo fleet tonnage is given in Table 3 [second page following], in which revenues Π from dry-cargo fleet shipments during the first year of the calculation period are taken as 100 percent.

As the reserve tonnage proportion increases, the amount of revenue lost decreases by the amount of revenue from operating the reserve ships (Table 4 [second page following]). For example, in the last year of the calculation period, the demand for reserve tonnage, R, was 11.4 percent (see Table 3), but due to the lack of reserve, the revenue lost $C_p(R) = 27.0$ percent. Had the maritime fleet had available to it a reserve equal to one percent of the total fleet tonnage, the income lost would have been correspondingly decreased to

$$C_p(R) = \frac{237 \times 11.4}{100} = 24.6 \text{ percent (see Table 4).}$$

Given a two-percent reserve,

$$C_p(R) = \frac{237 \times 2.0}{100} = 22.2 \text{ percent.}$$

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Table 2. Maritime Fleet Demand (by individual factor) for Additional Tonnage, Relative to Total Tonnage, in percent (numerator -- dry-cargo fleet; denominator -- bulk-oil fleet)

№	(а) факторы	(б) Год расчета, в процентах							
		1-й	2-й	3-й	4-й	5-й	6-й	7-й	8-й
(с) Первая группа									
1	Форс-мажорные обстоятельства (аварии, гибель судов, отчисления на спасательные операции)	0,8 0,7	0,8 0,2	0,3 0,2	0,4 1,7	0,8 0,9	0,7 0,1	0,1 0,1	0,9 0,7
2	Тяжелая ледовая обстановка	0,1	0,1	0,1	1,8	1,1	1,4	1,0	1,3
3	Неожиданные скопления судов в портах	1,3	1,3	1,3	0,4	0,3	0,4	0,6	0,4
4	Нарушение графика подачи топлива	0,4	0,1	0,1	8,7	0,5	24,4	37,5	9,2
(д) Вторая группа									
5	Незапланированные перевозки	1,1	0,6	0,6	2,8 0,4	0,1	0,1	0,1	0,1
6	Внеплановая аренда судов	0,1 0,9	0,6	0,6	0,2	0,2	0,2	0,2	0,2
(е) Третья группа									
7	Забастовки в иностранных портах	8,5	0,2	0,1	0,8	0,1	0,9	0,2	0,2
8	Закрывание каналов, портов и т. д.	19,5	0,2	0,1	2,4	0,1	0,3	0,1	0,1
9	События политического характера	1,0	1,2	0,8	2,4	0,8	3,4	1,9	1,9
10	Высокие фрахтовые ставки	1,0	1,3	0,8	2,4	0,8	0,9	1,2	1,2
(f) Итого . . .		13,2 22,5	3,6 2,7	2,5 2,0	14,7 7,3	2,0 1,7	29,0 5,8	39,2 3,0	11,4 1,1

Key:

- a. Factors
- b. Year of calculation period
- c. First group
- d. Second group
- e. Third group
- f. Total
- 1. Force majeure circumstances (accident, loss of ships, diversion to rescue operations)
- 2. Heavy ice
- 3. Unexpected accumulation of ships in ports
- 4. Failure to meet tonnage delivery schedules
- 5. Unplanned shipments
- 6. Unplanned ship leasing
- 7. Strikes in foreign ports
- 8. Closings of canals, ports, and so on
- 9. Events of a political nature
- 10. High charter rates

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Table 3. Calculating Revenue Lost $C_p(R)$ Due to Lack of Dry-Cargo Fleet Reserve, in percent

(1) Показатель	(2) Год расчетного периода							
	1-й	2-й	3-й	4-й	5-й	6-й	7-й	8-й
D	100	116	123	141	155	171	193	237
R (from Table 2)	13,2	3,6	2,5	14,7	2,0	29,0	39,2	11,4
$C_p(R) = \frac{DR}{100}$	13,2	4,2	3,1	20,7	3,1	49,6	75,7	27,0

Key:

1. Indicator
2. Year of the calculation period

Table 4. Calculating Change in Revenue Lost $C_p(R)$ At Different Values of Dry-Cargo Fleet Reserve Tonnage Proportion, in percent

(1) Доля резерва в общем тоннаже флота	(2) Год расчетного периода								(3) Суммарные потери дохода, %
	1-й	2-й	3-й	4-й	5-й	6-й	7-й	8-й	
0	13,2	4,2	3,1	20,7	3,1	49,6	75,7	27,0	196,6
1	12,2	3,0	1,9	19,3	1,5	47,9	73,8	24,6	184,2
2	11,2	1,8	0,7	17,9	—	46,2	71,9	22,2	171,9
3	10,2	0,6	—	16,5	—	44,5	70,0	19,8	161,6
4	9,2	—	—	15,1	—	42,8	68,1	17,4	152,6
5	8,2	—	—	13,7	—	41,1	66,2	15,0	144,2
6	7,2	—	—	12,3	—	39,4	64,3	12,6	135,8
7	6,2	—	—	10,9	—	37,7	62,4	10,2	127,4
8	5,2	—	—	9,5	—	36,0	60,5	7,8	119,0
9	4,2	—	—	8,1	—	34,3	58,6	5,4	110,6
10	3,2	—	—	6,7	—	32,6	56,7	3,0	102,2
11	2,2	—	—	5,3	—	30,9	54,8	0,6	93,8
12	1,2	—	—	3,9	—	29,2	52,9	—	87,2
13	0,2	—	—	2,5	—	27,5	51,0	—	81,2
14	—	—	—	1,1	—	25,8	49,1	—	76,0
15	—	—	—	—	—	24,1	47,2	—	71,3

Key:

1. Reserve as a percentage of total fleet tonnage
2. Year of the calculation period
3. Total revenue losses, in percent

Given an 11.4-percent reserve (the required value), the revenue loss is zero.

Revenue lost was calculated similarly for the remaining years. Total losses for the eight years, given change in the reserve as a percentage of total tonnage of from zero to 15 percent, are given in the far right-hand column of Table 4.

Table 5 [page following] gives calculations of expenditures C_{II} on maintaining the reserve tonnage. Here, too, all values are expressed in percentages

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Table 5. Calculating Expenditures C_R on Maintaining Dry-Cargo Fleet Reserve Tonnage, in percent

(1) Показатели	(2) Год расчетного периода								(5) Суммар- ные за период
	1-й	2-й	3-й	4-й	5-й	6-й	7-й	8-й	
(3) Расходы по основному флоту на содержание в доходе в базисном году	71,0	79,8	87,0	98,9	112,0	121,6	130,6	157,7	—
(4) Затраты на содержание резерва при доле в общем тоннаже									
1	0,7	0,8	0,9	1,0	1,1	1,2	1,4	1,6	8,7
2	1,4	1,6	1,8	2,0	2,2	2,4	2,8	3,2	17,4
3	2,1	2,4	2,5	3,0	3,0	3,6	4,2	4,8	25,6
4	2,8	3,1	3,0	4,0	3,7	4,8	5,6	6,4	33,4
5	3,5	3,6	3,5	5,0	4,4	6,0	7,0	8,0	41,0
6	4,2	4,1	4,0	6,0	5,1	7,2	8,4	9,6	48,6
7	4,9	4,6	4,5	7,0	5,8	8,4	9,8	11,2	56,2
8	5,6	5,1	5,0	8,0	6,5	9,6	11,2	12,8	63,8
9	6,3	5,6	5,5	9,0	7,2	10,8	12,6	14,4	71,4
10	7,0	6,1	6,0	10,0	7,9	12,0	14,0	16,0	79,0
11	7,7	6,6	6,5	11,0	8,6	13,2	15,4	17,6	86,6
12	8,4	7,1	7,0	12,0	9,3	14,4	16,8	18,8	93,8
13	9,1	7,6	7,5	13,0	10,0	15,6	18,2	19,7	100,7
14	9,7	8,1	8,0	14,0	10,7	16,8	19,6	20,6	107,5
15	10,1	8,6	8,5	14,8	11,4	18,0	21,0	21,5	113,9

Key:

1. Indicators
2. Year of the calculation period
3. Basic fleet expenditures relative to revenues in the base year
4. Expenditures on maintaining the reserve at the following proportions of total tonnage
5. Total expenditures

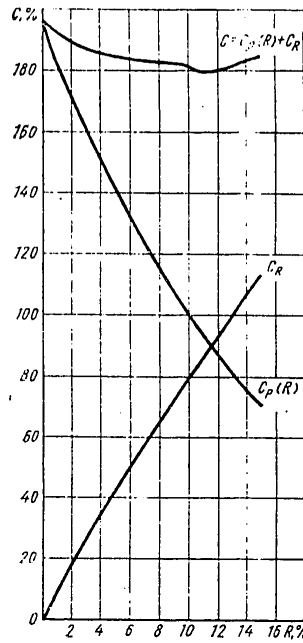
relative to revenues from shipments in the base year. It is evident from the table that, as the reserve increases, total expenditures on maintaining it over the eight years increase. In this regard, consideration is given to the fact that some reserve ships are idle in years when the reserve exceeds the required amount. In this instance, their maintenance is less expensive due to reductions in crews, fuel expenditures, and so forth. Expenditures on tonnage partly idle are given in lightface in Table 5. For example, in the last year of the calculation period, the demand for reserve was 11.4 percent of the total dry-cargo fleet tonnage (see Table 2). Consequently, all the reserve tonnage above this amount would have been idle.

It should be noted that in this particular case, the word "idle" is used quite hypothetically and only to stress the unevenness of the fleet reserve requirements over a number of years. Ordinarily, even with unfavorable charter market conditions, it is possible to use ships for "gif" shipments. However, this possibility is not considered in the calculations made here.

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Graph of Change in Losses As a Function of Dry-Cargo Fleet Reserve Tonnage Proportion



The calculation results are given in the drawing. The abscissa gives the reserve tonnage proportion R and the ordinate -- total losses in the form of lost revenue and expenditures on maintaining the reserve. Line $C_p(R)$ describes change in total revenue lost over eight years as a function of the change in the reserve tonnage amount; line C_R describes expenditures on maintaining the reserve. Line $C = C_p(R) + C_R$ is composite, reflecting change in total losses. It is evident from the graph that $\min C$ corresponds to $R = 11$ percent. Consequently, the optimum reserve tonnage amount equals 11 percent of total dry-cargo fleet tonnage.

Analogous calculations for the bulk-oil fleet yield $R = 4\%$.

These data, obtained on the basis of an analysis of fleet operation, should be viewed as preliminary. When calculating for the long range, consideration must be given to possible fluctuations in the factors determining the demand for reserves. Thus, there are grounds for assuming that the influence of the factors indicated in points 5 and 8 (see Table 2) will decrease significantly. At the same time, the demand for reserves might increase for factors 7 and 9. Implementation of the changes outlined in the 10th Five-Year Plan in the structure of the domestic fleet towards increasing the proportion of specialized ships, as well as the transition to fundamentally new methods of shipping cargo, will have a great influence on the size of the reserve.

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All these circumstances must be paid attention to when calculating optimum reserve amounts for the long term.

In connection with improvement in the struction and the creation of an automated control system for maritime transport, with the shift from planning based on what has been achieved to planning based on normatives, special importance is acquired by the studying of unforeseen factors which disrupt the stability and smoothness of the transport process, as well as by the creation of optimum reserves capable of forestalling the negative effects of these factors.

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BRIEFS

PATROL CRAFT BASE--At the end of the Kurland Gulf, by the mouth of the Dvina River, the Soviets are installing a new base capable of serving as a headquarters for the highspeed missile-launching ships and patrol craft based in the Baltic Sea. Supply dumps and repair facilities have recently been completed. [Text] [Paris VALEURS ACTUELLES in French 22 Oct 79 p 32]

TRUCK FACTORY DECENTRALIZED--For strategic reasons, the Russians have decided to decentralize their truck manufacturing plant on the banks of the Kama River. A factory for the manufacture of [truck] parts has been built at Neftekamsk in Bashkiriya. [Text] [Paris VALEURS ACTUELLES in French 22 Oct 79 p 32]

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