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USSR Report

CONSTRUCTION AND EQUIPMENT

(FOUO 2/82)



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CONSTRUCTION

INTENSIFICATION, EFFECTIVENESS OF EXPANDED REPRODUCTION

Moscow VOPROSY EKONOMIKI in Russian No 9, Sep 81 (signed to press 2 Sep 81) pp 86-96

[Article by USSR Academy of Sciences corresponding member A. Notkin: "Intensification and Effectiveness of Expanded Reproduction"]

[Text] Socialist expanded reproduction is the continuous renewal and development of productive forces and production relations of socialism. The organic bond among these processes was underlined in the materials of the 26th CPSU Congress: "The primary task of the 11th Five-Year Plan consists in ensuring continued growth in the well-being of the Soviet people on the basis of steady, forward development of the national economy, accelerating scientific-technical progress and changing the economy over to an intensive path of development, more efficient use of the country's production potential, saving all types of resources in every way possible and improving work quality."

Social reproduction is described in political economy from various aspects. If the reference is to its major divisions, we distinguish simple and expanded reproduction, its extensive and intensive types. In all instances, production forces are reproduced in a definite socioeconomic form which actively influences their level, rates of growth and proportions. In other words, all types and forms of reproduction conceal historically determined productive forces. This applies as well to their stages of development, both extensive and intensive.

At present, the most widespread form is reproduction intensification, in which economy in some factors is ensured by additional expenditures of others. Thus, a manpower savings is achieved on a base of growth in the availability of capital to labor, which generally requires an increase in fixed assets and expenditures of energy and auxiliary materials (especially when manual labor is replaced by mechanized labor). The better use of available fixed production assets necessitates additional production of objects of labor, even if proportionate expenditures on them decrease. Marx also characterized the intensive type of expanded reproduction in that an increase in the working time of fixed capital becomes possible only thanks to additional investments in supplemental circulating capital. Better use of basic means of production in farming, meaning land, as expressed in increased crop yields, is connected under present conditions with growth in mineral fertilizers production, development of irrigation systems and introducing a number of tools of labor. As a result of the interaction of a complex of production intensification factors, an overall reduction in socially necessary resources expenditures is achieved. A primarily intensive path of expanded reproduction signifies a predominance of economy in some resources over additional expenditures of and quantitative growth in others.

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Given primarily an intensive type of expanded reproduction, it is primarily live labor that is saved. At the same time, in the course of developing machine production, the tendency towards saving means of production is intensified.¹ However, given a predominance of mechanization of manual labor, the savings in means of production and the lowering of their cost only limit additional expenditures of means of production needed to save live labor.

The experience of 20th century economic development has revealed opportunities for changing over from a primarily intensive type of expanded reproduction to a more comprehensively intensive type on a national economic scale. In the industrial countries, machine production has already become the primary factor in productive forces development. Although the process of replacing manual with mechanized labor has continued in the 20th century, technical progress has increasingly been accompanied, not only in individual branches, but in all material production, by the continued development of machines and the transition to machine systems, by an increase in the power of each unit of equipment and of machine production as a whole.

In late 1980, the USSR had more than 170,000 mechanized and automated flow lines, about 70,000 units of equipment with preset control, and the number of comprehensively mechanized and automated sectors, shops and production facilities had reached 90,000, while the number of comprehensively mechanized and automated enterprises had grown from 1,906 in 1965 to 5,383 in 1975 and 6,389 in 1979. At the same time, obsolete machinery, apparatus, devices and items were being withdrawn from production (345 in USSR industry in 1965, 804 in 1970, 1,746 in 1975 and 7,255 in 1976-1979, or an average of 1,814 per year). As the comprehensiveness of production mechanization and automation have increased, the proportion of the active portion of means of labor, that which directly influences output growth, in fixed production assets has risen.

An increase in equipment unit capacity is being observed in many branches of our country's national economy. Thus, the maximum unit capacity of the steam turbines which have been put into operation was 300,000 kW in the Seventh Five-Year Plan and 800,000 kW in the Eighth, Ninth and first four years of the 10th; hydraulic turbines were 62,000 kW in the prewar five-year plans, 225,000 kW in the Seventh, 500,000 kW in the Eighth and Ninth, and 640,000 kW in the first four years of the 10th. At USSR thermal electric power plants, the power of installations with steam pressures of 130 atm or higher has increased from 21.6 million kilowatts in 1965 to 50.1 million kilowatts in 1970 and 132.1 million kilowatts in 1979, and their proportion of the total power of thermal electric power plants increased from 23 to 37 to 78 percent during that same period. The hourly productivity of rotary cement furnaces increased from 7.8 tons in 1940 to 21.4 tons in 1965, 30.4 tons in 1975 and 32.3 tons in 1979; the figures for cement mills are 10 tons, 22.9 tons, 28.9 tons and 30.7 tons, respectively. The maximum unit capacity of initial petroleum processing installations in operation has increased from one million tons per year in the prewar five-year plans to six million tons per year in the Eighth and Ninth and eight million in the 10th.

¹Marx himself noticed this tendency, writing that "the mass and value of the machines being used grow with the development of labor's productive force, but not proportional to growth in the productive force itself, that is, not proportional to the increase in the amount of product being delivered by these machines" (K. Marx and F. Engels, "Soch." [Works], Vol 25, Part 1, p 121). Chapter 5 of the first part of volume 3 of "Das Kapital" is devoted especially to economy in the use of constant capital.

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Structural shifts have occurred which favor a less capital-intensive processing industry as a whole (especially branches producing end products, and machinebuilding first of all). From 1970 through 1979, gross output in all USSR industry increased 1.72-fold, including a 1.75-fold increase in processing industry and a 1.36-fold increase in extractive industry. The ratio of the production accumulation norm to the recompensation norm has changed in favor of the latter, permitting the accelerated replacement of less-productive with more-productive equipment, saving on major overhauls and new construction, and expanding production with fewer expenditures of resources. Modern construction methods have permitted a sharp reduction in construction time and, given improvement in planning and material supply, in the proportion of unfinished construction. Thanks to the savings in fixed and circulating production capital, the accumulation factor has been lowered. (It is taken to mean the norm of production accumulation needed to obtain a one-percent increment in physical exchange of national income.¹)

Experienced personnel and socialist competition enable us to reduce the time involved in mastering designed capacities and planned economic indicators at new and renovated enterprises; at production capacities with "analogs" in the country, it can be lowered to the time needed for start-up and adjustment work. The scientific-technical revolution has posed the question of increasing the speed of production processes and reducing production time and work periods in a number of branches of industry. Reducing production time is becoming an important way of intensifying social production.

In solving the problem of providing new enterprises with manpower, the role of its redistribution in the national economy increases. In a number of socialist countries, in the first stage of socialist industrialization the redistribution of manpower from agriculture to nonagricultural branches (including new and renovated industrial enterprises) became a factor in the swift rise in their rates of economic growth. At present, when a large labor potential is available in all branches of production, the reference is to using manpower better. Given the former or a lower number of people employed at existing production enterprises, substantial production expansion can be achieved only with high rates of increase in labor productivity. At the same time, these rates have been inadequate in recent years in the USSR national economy (see table, following page).

The data presented testify that a substantial rise in the rates of labor productivity growth is the primary task in the area of intensifying social production in the USSR (especially in connection with the lower rates of increment in able-bodied population).

The importance of reducing the materials-intensiveness of production is also great. Many factors influence the materials-intensiveness dynamic. Reducing primary raw material losses during extraction, lowering specific expenditures of fuel, raw and other

¹Academician V. Nemchinov, in stressing that "the tempo and character of systematic development of the national economy depend on the initial structural proportions of the national economy, on the so-called structural potentials of each preceding period," has noted that: "Factor K_n , which describes the national income accumulation accounting for a one-percent increment, can be considered another important structural parameter. A. I. Notkin has determined that this factor shows what percentage of national income must be accumulated in a given year so that national income will increase one percent the following year" (V. S. Nemchinov, "Ekonomiko-matematicheskiye metody i modeli" [Economic-Mathematical Methods and Models], Izd-vo Mysl', 1965, p 29).

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Dynamics of Average Annual Rates of USSR Labor Productivity Increment (in percent)

	1961- 1965	1966- 1970	1971- 1975	1976- 1980	1981- 1985 (planned)
productivity of social labor	5.6	6.8	4.6	3.2	3.2 - 3.7
industry	4.6	5.7	6.0	3.2	4.2 - 4.6
agriculture (social production, average annual as compared with the preceding five-year plan)	4.8	5.4	4.1	2.8	4.1 - 4.4
construction	5.2	4.1	5.2	2.1	2.8 - 3.2
rail transport	5.6	4.9	4.4	0.1	1.9 - 2.3

materials, comprehensive use of raw material, reprocessing scrap, siting processing industry close to sources of raw material and fuel, lowering transport expenses, developing branches to produce artificial and synthetic materials and their more extensive use (along with natural materials), reuse of materials, more efficient production stocks and accelerated turnover of material circulating capital -- all this must facilitate saving objects of labor and natural resources. At the same time, involving "poorer" types of raw material in economic circulation, the necessity for enriching them and, in a number of instances, increasing shipping distances retard to some extent the reduction in social production materials-intensiveness. Materials-intensiveness is also influenced by changes in the branch structure and the proportion of materials-intensive branches and by production specialization growth which increases the gross turnover in the cost of objects of labor.

Some economists propose calculating materials-intensiveness by the ratio of social product or national income produced to the primary types of raw and other materials, fuel and hydroelectric power consumed in the course of a year. In our view, these proposals narrow the problem by leaving objects of labor at intermediate levels of production outside economic control. And they are in fact of interest in generalizing calculations. During the 1970-1979 period, national income produced increased 1.57-fold, extractive industry output (not counting foreign trade) increased 1.36-fold, and average annual agricultural production increased 23 percent from 1970 through 1980. A comparison of these figures provides a general idea as well of the change in the branch structure of the national economy which has permitted a substantial increase in national income with limited growth in primary raw material production. The known corrections made by foreign trade do not disaffirm the overall conclusion.

If the dynamics of materials-intensiveness in USSR social production are judged by data on growth in social product and national income produced, in comparable prices, the conclusion can be drawn that it increased by three percent in 1971-1975 and remained unchanged in 1976-1980, when gross social product and national income grew by an identical 23 percent. At the same time, USSR Central Statistical Administration estimates show that the savings in raw and other materials, fuel and other objects of labor in 1976-1980 was 11.4 billion rubles. We are faced with taking steps to ensure a systematic reduction in expenditures of objects of labor. This is of top-priority importance in saving both natural wealth and manpower, a large portion of which is employed at extracting primary and producing derived raw materials in industry and agriculture and at shipping them in transport. We plan to save 160-170 million tons (recalculated to conventional fuel) of fuel and energy resources in the

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11th Five-Year Plan and to lower specific expenditures of rolled ferrous metals in machinebuilding and metalworking by at least 18-20 percent, of steel pipe by 10-12 percent, and of rolled nonferrous metals by 9-11 percent.

As concerns the dynamics of return on capital, there have been periods in the history of USSR economic development when the return on capital has been higher. This was associated in considerable measure with rebuilding processes (after the civil war and World War II) which occurred on a base of available production capacities. The latter were either underutilized or were rebuilt and gradually brought up to capacity while retaining some parts of the enterprises. Replacing obsolete and obsolescent equipment with more productive equipment is currently of urgent importance in the Soviet economy. At the same time, factors are operating which retard the changeover to comprehensive intensification in all social production.

Large amounts of manual labor are still used in many branches. The comprehensive intensification of individual production facilities and branches must therefore be combined with manual labor mechanization (especially in auxiliary jobs). The importance of this problem was underlined in the CPSU Central Committee and USSR Council of Ministers decree on perfecting the economic mechanism (July 1979), which pointed out the necessity of setting five-year plan assignments on reducing the use of manual labor. Mechanizing manual labor facilitates both raising labor productivity and eliminating the manpower shortage and improving working conditions. At the same time, it is one factor causing growth in fixed production assets as compared not only with the live labor being used, but also with output (to the same extent that lowering the return on capital thanks to mechanizing auxiliary work is not compensated for by growth in the equipment use factor in basic jobs which has been caused by that mechanization). Involving the natural riches of Siberia and the Far East in economic circulation, the necessity of developing highly capital-intensive transport and the entire production and nonproduction infrastructure on a broad scale, large investments in agricultural fixed assets on which the full return will not be ensured right away, large investments in environmental protection -- all these processes also retard growth in the return on capital, which is an essential factor in comprehensive intensification of social production.

In 1980, USSR fixed production assets and materials circulating capital had increased 2.03-fold as compared with 1970 and national income produced had increased 1.62-fold. Consequently, the return on capital in all material production as a whole had dropped to 80 percent of the 1970 level. The average annual reduction was 2.2 percent per year. At the same time, the USSR possesses an enormous production apparatus, and even a comparatively small annual rise in its use factor (of 2 to 2.5 percent) could counteract the trend towards a reduction in the return on capital. Reducing the time involved in mastering new capacities, reducing equipment idle time, improving labor discipline and deliveries of materials and growth in the shift index in individual branches (foremost in machinebuilding and metalworking, where the equipment operation shift index is 1.35) can play a substantial role in this.

An economically substantiated price-setting policy for new equipment which conforms to increased capacity could be of substantial significance in counteracting the reduction in return on capital in price terms. Quite a few examples could be given of improvement in equipment use. In particular, the usable volume of blast furnaces per ton of pig iron has decreased from 1.19 m³ in 1940 to 0.977 m³ in 1950, 0.741 m³ in 1960, 0.597 m³ in 1970 and 0.549 m³ in 1978 (it rose to 0.566 m³ in 1979), and

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blast furnace running down time decreased from 4.6 percent of the nominal time available in 1940 to 1.8 percent in 1950, 1.2 percent in 1960 and one percent in 1970 (it increased to 1.6 percent in 1979). Average daily steel skim per square meter of hearth in open-hearth furnaces increased from 4.24 to 9.77 tons during that same period (decreasing to 9.49 tons in 1979), and down time in percentage of the calendar time available decreased from 24.2 to 9.6 percent (increasing to 10.5 percent in 1979). The use factor (in terms of calendar time available) for rotary cement furnaces increased from 0.51 in 1940 to 0.88 in 1975 and was 0.84 in 1979.

Actualization of the resolutions of the 26th CPSU Congress and the CPSU Central Committee and USSR Council of Ministers Decree of July 1979 "On Improving Planning and Strengthening the Influence of the Economic Mechanism on Improving Production Efficiency and Work Quality" is providing a new impetus to improving the use of all the means of production being used.

The opinion is sometimes expressed that no savings in some production factors can be achieved without additional expenditures on others. In our view, this opinion ignores the features of modern technical progress. The replacement of less-productive machines with more-productive ones not only increases the return on fixed assets, but labor productivity as well, and machines with higher unit capacities often require less expenditures of metal per unit of power. The interaction of factors in the system of comprehensive intensification is reflected in dissimilar rates of economy of live labor, materials and existing means of labor. Different rates of comprehensive intensification are possible, which has been proven in practice. Historical experience shows that a reduction in the labor- and materials-intensiveness of production is achieved faster and that the return on capital then stabilizes and begins to rise.

So the intensive type of expanded reproduction arising and developing on a base of technical progress, even given a predominance of the extensive type, then passes through two stages: first, the stage of primarily intensive development, in which an economy in one production resource (manpower) is achieved at the expense of additional expenditures of other resources (means and objects of labor, as well as energy), or else a savings in manpower and objects of labor is ensured with additional expenditures of means of labor, but in both instances, necessarily with an overall reduction in expenditures per unit of physical volume of social and net product; second, the stage of comprehensively intensive development, which is effected with a savings of all types of resources (manpower, means and objects of labor, energy, and also the country's natural riches) per unit of social product. In this regard, the character of the interconnection of the dynamics of various factors is changed. In the first stage of intensification, the manpower savings is achieved through additional expenditures of means of labor and energy; in the second stage, the savings in means of labor and the reduction in materials-intensiveness serve as additional means for saving labor resources as well. Saving means of production leads to a reduction not only in capital- and materials-intensiveness, but also in the labor-intensiveness of material production. At the same time, the relationship between gross and end product is radically altered in favor of the latter.

Comprehensive intensification has already been implemented in the first stage in individual spheres and branches, but the transition to the second stage will occur when the savings in all production resources becomes a continuously operating factor in the development of the national economy.

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Development of a socialist national economy on a path of intensification and passage through its different stages is a process whose results find expression in greater expanded reproduction effectiveness, in ensuring possibly large end results while minimizing expenditures of embodied and live labor and saving natural resources.

Finding a correct relationship of intensification and effectiveness is a most important question in the socialist economy. "Increasing production effectiveness in every way possible is the fundamental basis of modern economic development, a most important economic-political task of the current stage of building communism," notes the Materials of the 26th CPSU Congress.

Scientific development of various aspects of the problem of socioeconomic effectiveness in the USSR already has a long history. In the socialist industrialization period, the most attention was paid to the effectiveness of capital investments in individual construction projects. As a result of theoretical research and discussions in this area, methods were worked out for determining the economic effectiveness of capital investments -- a general method for all branches and individual methods for a number of branches, taking their specifics into account. Questions of capital investment effectiveness are also pressing in the period of transition to a primarily intensive type of expanded reproduction. The reference is to concentrating capital investments in the most important projects, to reducing the time needed to install new projects and utilize them, to the comparative advantage of capital investments in retooling, to fundamentally new equipment, as well as to equipment which saves both live labor and means of production.

A general theory of the socioeconomic effectiveness of socialist production as a whole was worked out in the 1970's. Enriched by the achievements of the political economy of socialism, this theory has played a large role in developing modern economic science and planning in the nations of socialism.

The approach of defining the intensive type of expanded reproduction as a system of interconnected factors predetermines a similar approach to measuring intensification effectiveness. The complexity of measuring a primarily intensive type of expanded reproduction results from the fact that purely extensive development is retained in individual sectors of the national economy: installing some enterprises at approximately the previous technical-economic level, enlisting additional manpower with the usual skills, developing new deposits, using new land and forests, new fisheries. We therefore need to determine the relationships of all intensive and extensive factors of expanded reproduction in order to solve the problem of intensification effectiveness.

The process of production intensification as a savings in some factors and additional expenditures of others finds adequate expression through the economic category of social labor productivity, described by the formula $\frac{NP}{L}$, in which dynamic NP (net product of society, expressed in comparable prices) also includes the savings in or additional material expenditures and L is the increment in those employed in material production or the increase in time worked, expressed in units of simple labor per year. However, $\frac{NP}{L}$ expresses only the current savings in live and embodied labor, but not the savings in or additional expenditure of production assets being used in production. In late 1979, the value of USSR fixed production assets exceeded

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one trillion rubles, but the value of fixed assets in commodity-material values reserves was almost 300 billion rubles. Their use plays an enormous role in developing the national economy. The most common indicator of production assets use is the return on fixed and circulating capital in the form of net product of society.

Labor productivity dynamics and return on capital are closely interrelated. Given previous capital amounts, increasing labor productivity increases return on capital. In turn, growth in return on capital leads to higher labor productivity. However, there are substantial differences between the dynamics of these two parameters. Whereas growth in return on capital generally leads to higher social labor productivity, growth in social labor productivity is naturally accompanied by a lower return on capital at certain stages (as, for example, in the large-scale replacement of manual labor by mechanized labor and a rise in the proportion of capital-intensive branches). At the same time, when return on capital is decreased, additional production accumulations are required to maintain the labor productivity growth rates and national income achieved, which limits consumption growth rates.

In the Seventh, Eighth, Ninth and 10th five-year plans, the relationship of the dynamics of social labor productivity and return on capital were as follows:

	social labor productivity	return on capital in social production
1961-1965	+5.6	-2.4
1966-1970	+6.8	-0.3
1971-1975	+4.6	-1.9
1976-1980	+3.2	-2.6

The figures given testify that return on capital nearly stabilized in 1966-1970, when the highest rate of social labor productivity increment was achieved. Stabilization of the return on capital was one factor in attaining high rates of social labor productivity growth. Therefore, it is always necessary, when planning the effectiveness of intensifying social production, to compare the dynamics of social labor productivity and the return on capital and to determine an effective measure of growth in the latter at which the impact of increasing labor productivity would exceed the additional expenditures associated with growth in the capital-intensiveness of production (taking into account the fact that each percentage point of these additional expenditures, in absolute terms, currently exceeds a one-percent increment in labor productivity by more than 2.5-fold).

A comparison of social labor productivity growth with the dynamics of return on capital enables us to judge not only change in the degree of intensification, but also, indirectly, the achieved level of effectiveness of it. This comparison expresses, first of all, the technical and organic composition of the production and, second, the actualization of this composition in social labor productivity. Thus, US&R gross social product grew 1.6-fold from 1970 through 1979, in comparable prices, and national income grew 1.57-fold, with a 1.42-fold increase in social labor productivity, a 1.92-fold increase in fixed and circulating production assets and a 1.14-fold increase in employment in material production. These data show that the rapidly growing organic composition of production is still being inadequately "compensated for" by the level of social labor productivity achieved in the USSR.

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The requirement of overcoming the gap between these values necessitates completing the transition to a primarily intensive type of expanded reproduction and developing a more comprehensively intensive type. To these ends, the 11th Five-Year Plan anticipates 18-20 percent growth in national income and 17-20 percent growth in social labor productivity, with an absolute and relative increment in capital investment less than in the 10th Five-Year Plan (by 12-15 percent). "In terms of its historical scale, importance and consequence," the 26th CPSU Congress noted, "the current transfer of our economy onto tracks of intensive development can rightfully be considered the equal of such very profound transformations as socialist industrialization, which fundamentally altered the face of the country."

Social production is the basic phase of reproduction, but it does not encompass the entire problem of socioeconomic effectiveness. The impact of intensifying expanded reproduction is not simply national income produced, but also national income used for consumption and accumulation. The end results of production, distribution, circulation and consumption are expressed in national income used; the foreign trade balance and a portion of the losses of product and income in the expanded reproduction process are also taken into account. The following data¹ show the quantitative differences in the absolute amounts of USSR income produced and used (in prices actually in effect) and their structure:

	1960	1965	1970	1975	1979
national income produced (in billion rubles)	145.0	193.5	289.9	363.3	438.3
national income used (billion rubles)	142.8	190.5	285.5	363.0	430.9
proportion of consumption resources (in percent):					
a) in national income produced	72.1	72.5	69.4	73.3	73.8
b) in national income used	73.2	73.6	70.5	73.4	75.1*
proportion of accumulation resources in national income used (in percent)	26.8	26.4	29.5	26.6	24.9

*With consideration of expenditures on housing and sociocultural construction related to the general accumulation fund, the consumption fund is approximately four-fifths of all used national income.

Use of national income used (NR_1) as the final impact of expanded reproduction requires that it be supplemented by control indicators of consumption and accumulation resources used. Consumption resources (designated K), as a primary part of used national income, are defined as the increase in the amount of material wealth consumed by workers in material production, expenditures on education, public health and meeting the cultural and personal-services needs of the workers, as well as expenses to cover wear in housing, the school network, hospitals, cultural and other institutions serving the population.

Consumption resources (K) are a control indicator of the impact of the entire expanded reproduction process. A comparison of the two impact indicators (NR_1 and K) describes the orientation of all socialist expanded reproduction towards increasing the well-being of the people (in spite of the absolute reductions in agricultural

¹The table data encompass only some differences between produced and used national income, inasmuch as they take into account only some of the losses.

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output which have occurred for a number of years, the proportion of consumption resources in USSR used national income has risen from 73.6 percent in 1965 to 75.1 percent in 1979, thanks in particular to the use of foreign trade for these purposes). At the same time, the impact of each reproduction cycle must consist not only of elements being consumed in a given period, but also of conditions of continued production and consumption growth.

Before becoming part of expenditures in the next production cycle, the production accumulation fund is part of the impact of the preceding production cycle. All used national income, on whose amount both meeting the current needs of the people and the possibility of expanded reproduction of the socialist economy in the interests of growth in the well-being of the people depend, therefore becomes an effect of the intensification of expanded reproduction under socialism. The possibility of maximizing the consumption fund unavoidably assumes the achievement of an optimum among production, consumption and accumulation. Comprehensive economy of accumulation resources for the purpose of increasing the well-being of the people is one of the most important intensification tasks of the 1980's.

Determining intensification effectiveness is associated with consideration of differences between produced and used national income, but also of differences between outlays on simple and expanded reproduction. A Marxist division of social reproduction into simple and expanded is a division from a viewpoint of end results, of total volume. That does not mean that all proportions remain as before under simple reproduction. Simple reproduction can be characterized by major shifts in technology, the economy and social relations, by a reduction or increase in the size of the fund for recompensing means of production as compared with the achieved level of production material expenditures. The following questions arise when determining the fund for recompensing means of production: in what amount must this fund be taken into account -- entire gross value circulation or that minus the value of objects of labor to eliminate the "recalculation" which occurs in the course of the year; what are the interconnections between the recompensation and accumulation funds.

The recompensation fund is the sum of all actual expenditures of means of production needed to obtain the year's national income. Its achievement also requires intermediate expenditures, and the task is to obtain the end product with the least possible such expenditures. When planning the proportionality of economic development, we need to examine the entire annual value circulation, as it is precisely here that the actual proportions among the spheres, branches and different aspects of production and reproduction arise. As concerns the question of the interconnection between the recompensation and accumulation funds, it arises first of all because the replacement of manpower by machinery also occurs within the simple reproduction framework, requiring a certain total accumulation, other conditions being equal. This accumulation requires that simple reproduction be viewed not in isolation, but as an integral part of expanded reproduction. It in no way follows from this fact that expanded reproduction always assumes accumulation (and production accumulation first of all) that accumulation is required only in expanded reproduction.

A number of economists and statisticians take the view that the accumulation fund is part of national income which is measured through the increment in fixed and material circulating capital and reserves, while the accumulation norm is the share of that increment in national income in a given year. At the same time, capital investments from national income in a given year predetermine the growth in fixed

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assets within that period of time only partially. A large portion of them go to unfinished construction and, in part, to increasing fixed assets in the given year.

The accumulation of circulating production capital is ordinarily defined as the increment in material circulating capital and reserves. It includes the increment in production stocks and unfinished production of finished products, commodities in the circulation sphere and agricultural output of the population. When the reference is to all phases of reproduction, then summing up all these material circulating assets is justified. However, when determining production accumulation, it is necessary to take into account only the substantive conditions of continuous updating and continuing growth in production. Stores of a large portion of the finished products in social production and agricultural produce among the population must be taken into account in the used national income in consumption resources. In so doing, the total value of expanded reproduction outlays will comprise actual recompensation of production funds plus the wage fund for production workers plus the accumulation fund for means of production. These outlays include expenditures on producing, distributing and circulating the entire social product. New substantive products are not created in the distribution and circulation phases, but the cost of services in storing, transporting, packing and packaging products, and so forth, is added. Losses comprise a certain portion of these outlays.

Inasmuch as the increment in fixed assets in a given year "feeds" on capital investments of previous years, adding a portion of the capital investments of the given year, it can be viewed as the equivalent of these investments and "enter" the outlays of expanded reproduction in the given year, together with total capital investments made to obtain the impact over a number of years. This removes the time-lag problem. It seems to us that the increment in fixed assets in the year preceding the year the national income is obtained is most suited to describing the accumulation fund, inasmuch as this increment is used mainly to obtain additional impact during that time segment.

Socialist accumulation serves the expanded reproduction of collectivized fixed and circulating capital, public ownership of the means of production and the entire system of socialist production relations. Whereas the accumulation fund is saved given this particular type of intensification, additional resources are formed for raising the level of well-being of the people and the socioeconomic effectiveness of the entire expanded reproduction process is increased, which is of very important significance during the period of developed socialism.

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CONSTRUCTION

UDC 69(0.83.75)

LIST OF GOSSTROY STANDARDS FOR CONSTRUCTION

Moscow PERECHEN' DEYSTVUYUSHCHIKH OBSHCHESOYUZNYKH NORMATIVNYKH DOKUMENTOV PO STROITEL'STVU I GOSUDARSTVENNYKH STANDARTOV, UTVERZHDENNYKH GOSTROYEM SSSR (PO SOSTOYANNIYU NA 1 YANVARYA 1981 g) in Russian 1981 (signed to press 8 May 81) pp i, 220-224

[Annotation and table of contents from the book, "List of Currently Effective Nationwide Standardizing Documents on Construction and State Standards Approved by USSR Gosstroy," published by USSR Gosstroy, Stroyizdat, 148,800 copies, 224 pages]

[Text] Prepared by the Section for the Setting of Technical Norms and Standardization of USSR Gosstroy.

The list includes: chapters of Construction Norms and Regulations (SNiP) of parts I, II, III and IV; standardizing documents for the manufacture of articles and structure at construction-industry enterprises; nationwide norms for the industrial design of enterprises that have been coordinated with USSR Gosstroy and GkNT [State Committee for Science and Technology]; standardizing documents for construction design, construction operations, survey-and-design operations, the mechanization of work and the operation of construction machinery, the consumption of materials in construction, questions of labor and wages in construction, and automated control systems in construction; and budget-estimating norms for structures and types of work.

SNiP chapters that have been republished with changes, supplements and corrections are denoted by the former code with an asterisk. In this case, the SNiP chapters without an asterisk remain in effect, taking into account the changes, supplements and revisions that have been introduced.

Changes and supplements introduced into standardizing documents, as well as corrections, are published in the monthly journal, BYULLETEN' STROITEL'NOY TEKHNIKI [Construction Equipment Bulletin] (BST) and in "Sbornik Izmeneniy i Dopolneniy k I, II i III Chastyam Stroitel'nykh Norm i Pravil (SNiP) i Instruktsiyam (SN)" [Collection of Changes and Supplements to Parts I, II and III of Construction Norms and Regulations (SNiP's) and Instructions (SN)].

For SNiP chapters that were approved in 1973-1980, the numbers are cited in accordance with the structure of parts I, II and III of the SNiP's that were approved by USSR Gosstroy Decree No 86 of 11 June 1979.

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This edition cites a list of currently effective state standards approved by USSR Gosstroy and also agency standardizing documents for construction design and construction operations that have been coordinated with USSR Gosstroy.

Standardizing documents (except for agency documents) for which no organization has been indicated in the "Approved" column were approved by USSR Gosstroy.

The list was compiled by Engineer M. G. Zelentsova (USSR Gosstroy).

The part, "State Standards Approved by USSR Gosstroy," was prepared by the Section for Scientific Bases of Standardization of TsNIIpromzdaniy [Central Scientific-Research Institute and Experimental Design Institute for Industrial Buildings and Structures] (Engineer L. A. Gamynina).

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CONSTRUCTION MACHINERY

HANDBOOK ON CONSTRUCTION MACHINERY AND EQUIPMENT

Moscow VOYENNOYE IZDATEL'STVO in Russian 1980 (signed to press 26 Feb 80)

[Annotation, Table of Contents and Foreword from: "Handbook on Construction Machinery and Equipment" by I. N. Krupnitskiy and Ye. P. Spel'man 544 pp 27,00 copies]

[Text] Krupnitskiy, I. N., Spel'man, Ye. P.

K 84 Handbook on Construction Machinery and Equipment--Moscow: Voenizdat, 1980--544 pp, ill.

A brief description of the arrangement, purpose and technical data of new and modernized construction machinery and equipment, potential troubles, and methods of detecting and eliminating them are given in the handbook. Questions about the technical use of and safety techniques for the machines and mechanisms are dealt with; information is given that is required by the organizers of the construction and technical processes in everyday practice. The handbook is intended for engineering and technical workers at construction sites, ranges and freight handling bases, designers, students in military engineering academies, schools and also equipment operators.

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Foreword

Technical progress in construction in recent years has been associated with an improvement in planning and structural schemes for buildings and structures, an improvement in and standardization of components in industrial and civil construction, and typification of their products list and varieties of products which has practically provided the growth in the industrialization of construction and made it possible to move the processes of manufacturing components and parts from the construction sites and substantially reduce labor consumption for construction.

The further goals of improving the efficiency of construction production and bringing about an uninterrupted growth in labor productivity are closely associated with evaluating and implementing production potentials which are based on the maximum utilization of intensive factors and reducing the duration of and labor consumption for construction. Accelerating the rates of growth for labor productivity on the basis of mobilizing the existing potentials for reducing labor consumption and the efficient use of work time is becoming an urgent necessity.

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The further mechanization of construction processes on the basis of utilizing the set of modern machines and mechanisms is an important factor in reducing labor consumption for construction. The increase in the number of every type of machine is accompanied by an increase in their power and the adoption of new improved types. Powerful excavators with an increased bucket capacity, scrapers with improved roadability, bulldozers with special suspended equipment and large-load dump trucks with improved roadability are appearing at construction sites.

Considering the huge volumes of construction and installation work that is done, each percent improvement in the level of mechanization provides a substantial reduction in labor expenditures. Calculations show that increasing the level of mechanization in earth work by only 0.8 percent makes it possible to free several men for each million rubles of construction and installation work.

The system of new machines that is arriving at construction sites in recent times corresponds more fully to technological demands and the conditions for producing work in various sectors of construction. The increase in the power and operating speeds of construction machinery is being accompanied by a substantial improvement in their power conserving indicators; they are equipped with means for programmed and remote control.

General purpose hydraulic excavators, bulldozers and rippers on powerful caterpillar tractors, wheeled tow cars, self-propelled scrapers with increased bucket capacities, wheeled and caterpillar loaders, mobile pile driving units, tubular diesel hammers, vibration drivers, equipment for laying out rammed piles, and machines for laying utility lines without trenches are being extensively used in construction. The fleet of tower cranes is increasing due to mobile pneumatic tire cranes on special chassis. Hydraulic cranes with telescoping booms have become extensively used. The structure of the fleet of tower cranes is changing due to an increase in the number of cranes with booms up to 60 meters long and cranes with a load lifting capacity of 10 to 25 tons. A further improvement in the structure of the fleet of machines will promote a reduction in labor expenditures in construction.

A general improvement in the level of mechanization and automation for construction processes and also an improvement in the use of machines over time should ensure the freeing of workers who are engaged in construction.

The current Handbook on Construction Machinery and Equipment has as its goal providing necessary information about new models of construction machinery and equipment, the serial output of which began in 1975 to 1978 and which is planned for subsequent years. Individual models of construction machinery and equipment that have the most long range importance and which are undergoing modernization and are being serially produced at the present time are also described in the handbook.

The purpose and scope of use of construction machinery and equipment is stated in the first section of the handbook and it contains brief descriptions of their arrangement and use; technical features, the peculiarities of the conditions for operating the machines, potential troubles and methods of eliminating them are given.

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An index of construction machinery and equipment, and the technical features of the base machines and tow trucks with which the self-propelled construction machines are combined is given in the second section (appendix). The basic standards and regulations for turning over machines and units for repair and accepting them back are stated.

The technical features of the machines and equipment given will help to select the most appropriate one of them and to use them more correctly and fully.

The Handbook on Construction Machinery and Equipment was compiled based on state standards, all union normative documents, catalogues, manuals, formulas and instructions for utilizing the plants that manufacture construction machinery and equipment.

Drawings of only the leading, most characteristic models of machines that have the most long range importance are given in the handbook. For the convenience of readers the basic normative materials for utilizing machines are indicated in the handbook.

The handbook is intended for engineering and technical workers at construction sites, ranges, loading and unloading bases, designers, students in military engineering academies, schools and also equipment operators.

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