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USSR Report

CONSTRUCTION AND RELATED INDUSTRIES

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CONSTRUCTION PLANNING AND ECONOMICS

GOSSTROY'S DEMINOV ON IMPROVING PLANNING, MANAGEMENT

Moscow SOTSIALISTICHESKAYA INDUSTRIYA in Russian 3 Aug 84, p 2

[Article by A. Deminov, first deputy chairman of USSR GOSSTROY "Order at the Construction Site"]

[Text] The CPSU Central Committee and USSR Council of Ministers' decree "Concerning an Improvement in the Planning, Organization and Management of Capital Construction" was recently published. Measures were outlined in it which remain to be implemented before the end of the 11th and during the 12th Five-Year Plans.

First of all, I would like to emphasize the continuity of these measures. Significant changes occurred in capital construction after the CPSU Central Committee and USSR Council of Ministers' decree concerning improving the economic mechanism (it was approved 12 July 1979). The system of planning indicators, which orients builders more accurately toward the final results of the work, underwent analysis. The new incentives for achieving such results were also tested. An altered system of construction financing and loans is being adopted. Much that is new emerged in organizing and managing work directly at the job site.

Life, however, has shown that some of the measures outlined need to be worked out much more fully and in more detail, and something needs to be changed in order to completely implement others. For example, under the management structure that has come about, the approach to capital construction becomes more specifically defined by the interrelationships of the builders with the client as being an integral part of a single national economic complex. By considering this the way to further improve construction affairs is set.

The first of the goals that has been set is to raise capital construction planning to a new level. What is the problem in this? First of all, in the fact that the plans for putting capacities and structures into operation are still not being satisfactorily met. For example, last year, although the standard length of time had run out, such important capacities as the following had not been put into operation: the Kemerovo Production Association "Azot" with a capacity of 450,000 tons of ammonia, the Tashkent Cotton Combine with a capacity of 106 million square meters of finished fabrics, the Azov Industrial Complex for producing canned baby food....

Another problem is the above standard amount of incomplete construction. True, there is a projected tendency of this volume declining; however, the dispersion of forces and funds continue. It has been estimated that it would require no less than five years in order to finish the construction work that has already been started.

A third problem is carrying over, for various reasons, the turnover of completed projects to the fourth quarter. At present, three out of every five especially important construction projects are scheduled to be completed between October and December.

In order to fundamentally improve planning, the role of the five-year plan must be significantly enhanced, and the five-year plan must truly be made the principal form of planning. Such an expansion of planning horizons is the main condition for the stable confident work of builders. But, unfortunately, only a third of the construction subdivisions now have more or less reliable five-year programs.

And how does one disseminate this practice to all and, most importantly, how does one improve the reliability of the construction plan? In other words, how does one balance it with regard to financial, material and technical resources, and the capabilities of construction organizations? It is important here that clients have a uniform approach to matters--existing production and new construction must be viewed as a whole during planning.

This, incidentally, was well known before. But in order for the idea to materialize certain key economic factors must be put into motion. Why, for example, do administrators in certain industrial ministries to this day persistently try to take on new construction work even though the existing capacities that they have at exactly the same industries are not being fully used? Because there was no system that would unequivocally give either a "green light" to the new construction project or prohibit it. Now such a system is being adopted. Call for limits on capital investments--present, if you please, data on the level at which capacities that have already been built are operating, what the shift coefficient is and what the standards for the annual equipment operation assets are.

But that is not all. It is not enough to demonstrate that the operating industries are working at full capacity. What resources are being allocated toward technical retooling and reconstruction? Is the proportion of expenditures for adopting new technological processes and equipment of the total amount of capital investments growing? Have projects that have already been started been completely financed? Will their start-up be ensured within the standard period of time? Discussions about new construction will be held only with positive answers to these questions.

Specialists have repeatedly presented the following problem in the press, in particular SOTSIALISTICHESKAYA INDUSTRIYA--new capacities are being put into operation but there is no one to work at them--there is no housing. This is especially acute in Siberia and the Far East. The ministries have clearly allocated insufficient funds to erect housing units and other buildings for

social and cultural purposes there. Now, overall construction has been placed under strict control--housing and social projects must be completed by the time enterprises are put into operation.

Improving the quality of housing construction is a very serious problem. The reasons are many. It happens that the designers undermine it. And the building materials industry turns out products and components that are, to say the least, not completely factory finished by far. And transport workers are not trying very hard to deliver products to the construction site in their entirety or securely. But the main reason was and remains the attitude of the construction workers themselves toward their work. This is why it is very important to take urgent measures to train and retrain personnel, to increase the demand and accountability for order at all stages of the construction process.

Many economists have demanded more than once that the preparation of the construction site to produce work be better regulated. These wishes are being taken into consideration. Clients must complete a review and fine tune the design and estimate documentation by 1 April 1985--two months earlier than it was done before--for projects that are being carried over to the 12th Five-Year Plan. This means that there will be more time remaining before the beginning of the next construction year to organize deliveries, for utility preparations, and for selecting crews.

A special subdivision is being created during the five-year plan in order to better coordinate the wishes of clients with the capabilities of builders. It will be intended to develop production capacities in construction and installation organizations and enterprises that deliver building materials. For their development should be planned along territorial sections.

Life itself prompted such an approach. The departmental approach to forming a material and technical base for construction is fraught with especially palpable troubles. When various ministries are building the same type of production in a region it is difficult to count on them being fully utilized, being at a high technical level, or having good quality. Not to mention the fact that each of the ministries tries to use products from just his plant and thereby transports them sometimes thousands of kilometers.

A battle was waged against this before. For example, in Belorussia and several other regions of the country they began to draw up general schemes for locating construction industry enterprises long ago. But these schemes had no planning effect and everything continued as before. Now it has been firmly established that enterprises in the construction industry must be under the jurisdiction of one master--the main territorial construction administration. They are obligated to ensure that construction bases are harmoniously developed within the framework of a region.

We now come to the second central question of capital construction--improving the management structure. The following goal has been set--to transfer to the two- and three-link management system during the current and following years. What is intended is that in each region the territorial main construction administration has the responsibility to coordinate the work on all projects

irrespective of who the client is. It may be more than one zone, such as several neighboring oblasts.

Much reorganization work remains to be done. I will note only that territorial management schemes, which specify the consolidation of various small departmental construction organizations and the formation of the full-blooded primary link--the trust--must be worked out no later than the first quarter of next year. Mobile subdivisions also need to be formed and consolidated to erect structures in places that are far from the stationary bases.

These and several other measures will make it possible to reduce the number of tiers and bring the management agencies closer to construction production. I think that no one doubts the gains. First of all, the authority of the trust as the general contractor is increased. Secondly, it can flexibly maneuver resources. And thirdly, unprofitable small organizations will be able to be eliminated and construction efficiency improved.

Strictly speaking, improvement in efficiency is the main goal of all the measures outlined. The center of attention is a cardinal improvement in labor productivity.

The first words here are about machine builders. The delivery to construction sites of powerful machines (16 ton truck cranes, 250 ton caterpillar cranes, and excavators with a bucket capacity of up to 2.5 cubic meters, for example), small means of mechanization and mechanized tools must be increased substantially.

I will emphasize that the first, second and third are needed. Experience has shown that powerful technology does not consist of switching over to small mechanisms but more so to tools. The level at which builders are supplied with mechanized means has increased by a factor of 2.7 since 1970 while labor productivity has increased by only 47 percent. One of the reasons for such a difference is the predominance of expensive machines at construction sites while not being very well supplied with small means of mechanization and tools. It is also impossible not to notice that machine builders have long been oriented toward producing machines with an average unit output. As a result an acute deficiency has come about of powerful machines on the one hand and mini-technology on the other.

Scientific and technical progress is the main but not sole factor in improving labor output. Adopting progressive methods of producing work, and improving deliveries, design and estimate matters, and systems of labor payments and incentives are also needed.

Models will be singled out from the construction and installation organizations and enterprises in the construction industry. In the next three to five years they will complete construction of a number of projects for various ministries that will set the standard. This is where the newly discovered and future management innovations will be fully tested. I am sure that these schools of modern management will be of good service for the entire construction sector.

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GOSPLAN DEPUTY CHIEFS ON CAPITAL INVESTMENT PLANNING

Moscow PLANOVOYE KHOZYAYSTVO in Russian No 8, Aug 84 pp 55-63

[Article by V. Balakin, deputy department chief, USSR Gosplan, and A. Stepun, department chief, USSR Gosplan: "The Further Improvement of Planning, Organization, and Administration of Capital Construction"]

[Text] Capital construction, which, together with machine-building, guarantees the expansion and renovation of fixed assets, is of decisive importance in improving the proportions in the national economy and contributes to the acceleration of scientific-technical progress in all branches of the socialist economy.

Judged on the basis of the scope of capital construction, our country has occupied first place in the world for a long time. The capital investments in the national economy constitute one-fifth of the national income. At the present time our country annually activates approximately 200 large-scale industrial enterprises, as well as a large number of new shops and production entities at plants and factories that are being expanded and remodeled. Every day an average of more than 300,000 square meters of total area of housing are turned over. Our country is successfully implementing large-scale construction programs -- the building of the Baykal-Amur Railroad main line, the exploitation of the West Siberian petroleum and gas complex, etc.

At the same time, in capital construction, as was noted in the decisions of the 26th CPSU Congress and the subsequent plenums of the CPSU Central Committee, there is a rather large number of unresolved problems. The shortcomings in planning, in construction-planning and estimate work, and in the organization of construction production have not been eliminated. There has been a decrease in the responsibility -- both on the part of the customer ministries, construction ministries, and on the part of the ministries that act as suppliers of equipment, structurals, and materials, and by the associations and enterprises, that is, the basic participants in the process of creating new projects and of remodeling the existing ones -- for the prompt activation of the capacities or for the effective use of the capital investments. There have been instances of failure to meet the planned deadlines for the activation of production capacities and projects, to no small degree as a consequence of the continuing dispersal of capital investments at a large number of construction sites. In a number of branches

there are large above-norm volumes of incomplete construction and the extent of the work involved in remodeling and the technical re-equipping of production is insufficient. Labor productivity in construction is increasing at slow rates, the principles of cost accountability are being introduced weakly, and many construction-and-installation organizations are operating at a loss. There have been complaints about the poor quality of fulfillment of construction-and-installation operations. The structure that has been formed as the present time in the administration of construction no longer conforms to the increased volumes and complexity of the operations to be fulfilled, or to the advanced methods of organizing production and labor.

The CPSU Central Committee and the USSR Council of Ministers recently enacted the decree "Improving the Planning, Organization, and Administration of Capital Construction," which stipulates the carrying out of steps aimed at the fundamental improvement of the situation in capital construction.

The enactment of this keynote document is yet another manifestation of the concern shown by the Communist Party and the Soviet government for this very important branch of the national economy. The decree defines a number of major measures aimed at improving the practice of planning capital construction. USSR Gosplan, the USSR ministries and departments, and the councils of ministers in the union republics have been given the responsibility of guaranteeing the proper balancing of the financial limits for capital investments and construction-and-installation operations with the financial and material resources, as well as with the capacities of the construction-and-installation organizations, both for the branches as a whole and from a territorial point of view. The improvement of the balancing of the capital-construction plan and the resources, in addition to the consistent reduction in the quantity of projects that are simultaneously under construction, is supposed to guarantee the carrying out of those projects in conformity with the norms for duration of construction and the resolution of the assigned task for bringing the volume of uncompleted construction to the established quotas within the next three or four years.

The CPSU Central Committee and the USSR Council of Ministers have deemed it inadmissible to divert construction and installation organizations, or materials and technology, from projects stipulated by the state plan for the carrying out of unplanned construction and they established that any such instances should be viewed as a violation of state and party discipline and that the workers who are guilty of those acts should be brought to strict accountability.

There has been a considerable stiffening of the requirements the observance of which must be strictly mandatory when resolving questions about including new projects in the plan. New construction can be carried out, provided that the capacities of the existing enterprises in the particular branch, with a consideration of their technical re-equipping and remodeling, are used completely, and for previously begun construction sites capital investments have been allocated for the prompt guaranteeing of their activation, and also, when the construction-planning and estimate documentation that has been promptly approved within the established deadlines exists, with a definition in it, if necessary, of the complexes that are slated for activation in the

in it, if necessary, of the complexes that are slated for activation in the next reporting period.

When developing capital-construction plans, provision must be made for channeling the capital investments first of all into the carrying out of measures that are linked with the introduction of the latest scientific-technical achievements into the national economy; into the technical re-equipping and remodeling of the existing enterprises; the complete development of the raw-materials and processing branches; and the elimination of the interbranch and intrabranch disproportions. It is necessary to pay special attention to the guaranteeing of the activation of combined capacities in the chemical and petrochemical industry with regard to the production of mineral fertilizers, polyethylene, propylene, polystyrene, chemical fibers, and automobile tires; in ferrous metallurgy -- the guaranteeing of the proper conformity of the capacities among the blast-furnace, mining, and coke-chemical production entities; in branches of machine-building, primarily between the basic production entity and the blank entities; in textile industry -- between the capacities of the spinning, weaving, and knitting shops and the finishing production entities; and in agriculture -- between the volumes of production and blanks and the capacities for the storage and processing of output.

The chief means of planning of capital construction is the five-year plan with the subdivision of the assignments into the individual years of the five-year plan. At the same time, actual practice has confirmed the desirability of preparing the draft versions of the plans for two consecutive years on the basis of the five-year plan. It has been established that, beginning in 1985 organizations will carry out the development of the plans for activation of the production capacities and projects for the year that is being planned, with a numerical breakdown by individual quarters, and the year that follows it, with a numerical breakdown by half-years; simultaneously, provision must be made for financial limits for capital investments and construction-and-installation operations and for the delivery of equipment for the carrying out of the activation of the capacities within the established deadlines.

Something else that requires further improvement is the practice of preparing the annual plans. In particular, it becomes necessary, when developing the draft versions of those plans, while still at the preliminary stage of considering the recommendations of the USSR ministries and departments and the councils of ministries of the union republics, to stipulate a definite priority sequence for the construction sites with respect to the first-priority inclusion in the plan of those enterprises and projects that are of very great importance to the national economy or that determine the resolution of urgent tasks in the development of a particular branch, subbranch, or production entity. These construction sites must include, first of all, the construction sites that are slated for activation in the year being planned and in the year following it; construction sites being built on the basis of complete sets of imported equipment; enterprises and projects at which operations involving remodeling and technical re-equipping are being carried out; as well as construction sites that are linked with the introduction of new technology and technological processes into the national economy, with the creation of means for eliminating heavy manual labor, etc.

For purposes of the specific implementation of this principle of planning, USSR Gosplan has been given the responsibility of determining, in April of the year preceding the year being planned, the financial limits for the contract operations for the basic contract construction ministries both as a whole, and from the territorial point of view, with a consideration of the existing capacities of the construction-and-installation organizations and the prospects for their development, in order to guarantee the fulfillment on the particular territory of the planned volumes of construction-and-installation operations, primarily for the most important construction sites.

One of the fundamental tasks in improving the planning of capital construction continues to be the guaranteeing that the plans reflect the inseparable link between the planning of the existing production and the establishment of assignments for the buildup and creation of new production capacities. The development of the five-year plans for capital construction must be preceded at all levels -- from the enterprises to the ministries -- by the ascertaining of the capabilities of the efficient and most complete use of the reserves of the existing production entity with a consideration of its remodeling and technical re-equipping, for the purpose of obtaining, with the minimal expenditures, the maximum and rapid economic benefit by means of renewing the previously created fixed assets on a new technical basis. That will make it possible to narrow the operations front efficiently, removing the excessive work load from the construction organizations that has been occurring in recent years in a number of parts of the country.

It should be noted that, in the implementation of this principle of planning for the existing production entity and for new construction, there have been definite positive shifts. For example, in the plan for the 11th Five-Year Plan and in the annual plans, balance sheets for production capacities are approved for the most important types of output. USSR Gosplan has approved the necessary methodological documents dealing with the development -- at the enterprises and associations themselves, and on the level of ministries -- of five-year plans for technical re-equipping, with the computations of the necessary capital investments and material resources. In the state plans for the economic and social development of the USSR, the USSR ministries and departments and the councils of ministers of the union republics have established for them, among the basic indicators, the financial limits for capital construction for the technical re-equipping and remodeling of the existing enterprises and corresponding assignments for the increase in the capacities.

With a consideration of practical life, refinements have been made in the concepts that determine the nature and composition of the operations that pertain to the technical re-equipping, remodeling, and expansion of the existing enterprises and to the construction of new ones.

During recent years it has been possible to increase the percentage of the capital investments channeled into the technical re-equipping and remodeling of enterprises, from 32.8 percent in 1981 to 34.4 percent planned for 1984, which, however, by no means corresponds completely to the course that has been adopted for the maximum intensification of production.

In order to increase the substantiation and to improve the practice of elaborating the five-year plans for capital construction, the CPSU Central Committee and the USSR Council of Ministers, in the decree that was mentioned, required USSR Gosplan, when determining the financial limits of capital investments for the development of the branches of the national economy and the branches of industry, to proceed from the need to plan the existing production and new construction as a single whole, providing for the allocation of capital investments for the development of the branches for the planned increase in the volume of production of output and the rendering of services.

The USSR ministries and departments and the councils of ministers of the union republics have been given the responsibility of submitting to USSR Gosplan, when preparing the five-year plans, substantiated recommendations with regard to the financial limits of capital investments and the creation of new production capacities, proceeding from the quotas lists for the use of the existing capacities and the coefficients for the shift operation of the equipment and the broad introduction of technical means that guarantee a considerable increase in labor productivity.

For this purpose it is necessary to create a system of coefficients, norms, and quotas by orienting oneself at which it is possible to reveal more completely the real reserves for an increase in labor productivity and production at the existing enterprises. In this regard the USSR Gosplan departments and the Scientific-Research Institute of Planning and Quotas will have to carry out, jointly with the appropriate ministries and departments, a large amount of methodological work so that these norms and quotas will be promptly developed, approved, and used when establishing the five-year plan for 1986-1990.

Practical life has shown that, for the complete and effective carrying out of the technical re-equipping and remodeling of existing enterprises, it is necessary to have, in each association and at each enterprise, plans for the technical re-equipping of production for the forthcoming five-year period (with a determination of the assignments and measures for the individual years) with computations of the necessary resources and the planned economic benefit resulting from their implementation.

However, as a result of a number of inspections it was established that at many enterprises the plans for technical re-equipping are completely nonexistent, or have been prepared in such a way that they frequently do not contain any data that substantiates the economic desirability and effectiveness of the planned measures. There have been frequent instances when ministries, considering the recommendations from the enterprises for technical re-equipping, limit themselves to allocating funds for the purchase of equipment and do not stipulate the necessary financial limits for the construction-and-installation operations even for setting it up. As a result, those plans for technical re-equipping lose all sense.

In order to eliminate these shortcomings and put that important work in the proper planned channels, the USSR ministries and departments, the councils of ministers of the union republics, and USSR Gosplan have been given the

responsibility of guaranteeing the development -- for 1985 and for the 12th Five-Year Plan -- of plans for the remodeling and technical re-equipping of existing enterprises, as well as composite plans for the carrying out of those operations for the appropriate branches. The ministries, departments, agencies of material-technical supply, and the suppliers of equipment are responsible for guaranteeing the complete and first-priority delivery of equipment and materials for the fulfilling of those operations.

One of the most important ways to achieve a fundamental improvement of the situation in capital construction is the improvement of the system of administering construction. The basic areas in this work are: the reduction of the number of administrative levels; the consolidation of contract organizations; the development of their specialization and cooperative efforts; and the improvement of the structure and the refinement of the functions at all levels of administration.

The existing system of the agencies that administer construction developed basically at the end of the 1960's and subsequently did not change fundamentally. During recent years certain negative factors have been manifesting themselves in the structure of the administration of construction. For example, whereas prior to the 10th Five-Year Plan the construction organizations became consolidated, by 1980 the volume of operations fulfilled on the average by a single contract organization during a year decreased, particularly as a result of the fact that the branch nonconstruction ministries and departments created a large-scale network of their own contract organizations, which sometimes function in parallel with the contract organizations of the construction ministries. During 1976-1980 in the branch ministries and departments the number of new contract organizations that were formed was greater by a factor of 1.5 than in all the construction ministries, which, as a rule, were small-scale with a low level of labor productivity. Serious shortcomings also manifested themselves in the development of the production base of construction. For example, in Sverdlovsk Oblast more than 40 plants producing reinforced-concrete structurals are in operation. Some of them have backward technological processes and produce poor-quality articles. At the same time a number of large-scale modern enterprises have not been given a complete work load. The introduction of proper order into this situation is hindered by departmental barriers (the plants are subordinate to 15 branch ministries). The fractionation of the production base is also observed in other regions. Thus, the organizational forms of administration of construction production have largely ceased to conform to the changed construction conditions or the requirements of the effective management of the economy.

In the decree it is noted that during recent years there has been created the incorrect situation in which many construction-and-installation trusts which are general contractors have reduced their responsibility for guaranteeing the activation of enterprises, buildings, or other structures within the established deadlines and have been unsatisfactorily fulfilling the functions of coordinating the construction.

It has been established that the basic cost-accountability link in the administration of production must be the construction-and-installation trust (production construction-and-installation association or other organization that is equated to a trust). It must represent a single economic-production complex, the chief task of which is the guaranteeing of the prompt activation of the production capacities and projects that have been prepared for the production of output or the rendering of services in complete conformity with the plans for economic and social development. The construction-and-installation trust bears the responsibility also for the fulfillment of the volumes that have been established by the plan for the commercial construction output and construction-and-installation operations while guaranteeing their high quality on the basis of progressive technological processes and forms of organizing labor; and for the increase in labor productivity, the economical expenditure of material resources, and the introduction of the achievements of technical progress into construction production.

The makeup of the organizations, enterprises, and subdivisions that are part of the trust is approved by the ministries and departments on the basis of the volumes and structure of the construction-and-installation operations, the territorial placement of the projects being constructed and the enteprises in the production base, and the economic desirability of cooperative action with organizations, enterprises, and management entities that are not part of the makeup of the trust. The makeup of the trust, depending upon the specifics of the operations to be fulfilled by it, must include, as a rule -- in addition to the general construction and specialized contract organizations -- subdivisions responsible for the mechanization of operations, operations involved with technological-production components, and other management entities. These subdivisions are part of the trust as production entities. Taking into consideration the fact that in a number of instances a measure that has proven its worth is the centralization of the means of mechanization and motor transportation in the specialized organizations that are subordinate to an agency in the middle link of administration (main territorial administration for construction), it is desirable to assign to the trust, in the status of operational subordination, production subdivisions of specialized organizations for mechanization and transportation. In such instances the activity of those specialized organizations should be evaluated on the basis of the final results of the construction production.

Thus, in conformity with the requirements of the present-day stage in the development of construction production, the trust as the basic cost-accountability link of administration must represent a powerful independent, organizationally isolated system that is completely capable of resolving its chief task -- the guaranteeing of the prompt activation of production capacities and projects. However, at the present time many construction trusts fail to meet these requirements. Last year only every third trust actually fulfilled by its own efforts construction-and-installation operations in a volume of more than 15 million rubles. At the same time an economic analysis that was carried out on economic-production activity convincingly proves that the optimal capacity of a trust should be no less than 25 million rubles with regard to the volume of construction-and-installation operations to be fulfilled by their own efforts. However, the consolidation should not be carried out by means of the mechanical unification of small-scale

organizations, since the necessary economic conditions and realistic prerequisites for this currently do not exist everywhere. At the same time one should not drag out the implementation of this important job.

Under conditions of the development and deepening of all types of specialization, and especially when constructing large-scale industrial enterprises, it becomes necessary to carry out the precise coordination among all the participants in the construction. Therefore a factor that takes on fundamental importance is the increase in the role and responsibility of the trust that is the general contractor in coordinating the activity of all the participants in the construction. It has now been established that the decisions made by the trust that is the general contractor with regard to the questions linked with the fulfillment of the approved plans and operational schedules are mandatory for all participants in the construction, irrespective of their departmental subordination.

Provision has been made for an increase in the role and responsibility of USSR Minmontazhspetsstroy [Ministry of Installation and Special Construction Work] as the agency that carries out the subcontract operations, which are of exceptionally great importance. For that ministry, and for its organizations, USSR Gosplan must approve in the five-year and annual plans the assignments for activation of the production capacities in conformity with the deadlines established by the general contractor. USSR Minmontzhspetstroy must guarantee that all its subordinate organizations fulfill the volumes of operations according to the subcontracts in strict conformity with the schedules and assignments for activation of capacities. The fulfillment of these operations and assignments is currently taken into consideration when evaluating the activity of and providing the economic incentives for the organizations in USSR Minmontazhspetsstroy. For purposes of improving the work of the organizations in that ministry, the production-management administrations are being reinforced, and their role in coordinating the activity of the various subdivisions of its system at the construction sites is being increased. The role of the trust as the basic cost-accountability link of administration of construction production should be viewed as the initial factor in the work of improving the entire system of administration of construction both from the branch and the territorial point of view. First of all one has in mind the guaranteeing of the systematization of the structure of administration of construction in such a way that, in the oblasts, krays, autonomous republics, and union republics that are not divided into oblasts, the construction is carried out, as a rule, by the organizations of a single general-construction ministry, which is given the responsibility for the fulfillment of the operations for all the customers in the particular region (except for the operations the fulfillment of which has been entrusted to specialized ministries). These organizations are united as part of the main territorial administration for construction, the activity of which, depending upon the volume of operations, can extend to one oblast or to several oblasts. These main territorial administrations of the general-construction ministries are given the responsibility of fulfilling the functions of the lead territorial agencies for administering the construction, which carry out the coordination of the development of the capacities of the construction organizations and their production bases in the area of activity of the main administration.

In the course of carrying out this work we must carry out the unification of the small-scale construction organizations that are existing in parallel, the efficient change of their departmental subordination, and the consolidation of the construction-and-installation organizations. As a rule, the enterprises in the construction industry that are concentrated under the jurisdiction of the lead territorial agencies of administration of construction are those enterprises whose output must be guaranteed by all the organizations carrying out construction-and-installation operations in that region.

At the same time it is necessary to consider the fact that the execution of operations involving the expansion, remodeling, and technical re-equipping of individual existing enterprises can be done in an economically effective manner by the efforts of the contract organizations that are subordinate to the corresponding agencies of branch administration. In these instances the ministries and departments are authorized, on the basis of determination by USSR Gosplan, to retain those organizations. These questions must be given an economic and technical substantiation and must be resolved jointly with USSR Gosplan.

The USSR construction ministries, USSR Minenergo [Ministry of Power and Electrification] and USSR Minvodkhoz [Ministry of Land Reclamation and Water Resources], the other ministries and departments that have construction organizations, and the councils of ministers of the union republics have been given the task of eliminating the multiple administrative levels and of guaranteeing the transition to a two-level or three-level system of administration.

The systematization of the branch and territorial structure of administration of construction is an important economic measure, the chief direction of which should be considered to be the elimination of departmental barriers, and the formation of large-scale, single, organizationally isolated construction systems.

The construction ministries, USSR Minenergo, and USSR Minvodkhoz must submit during the current year to USSR Gosplan, USSR Gosstroy, USSR Goskomtrud [State Committee for Labor and Social Problems], and USSR Minfin [Ministry of Finance] general schemes that they have developed for the administration of construction. Those committees, departments, and USSR Minfin, as those schemes are ready, but no later than the first half of 1985, must submit them to USSR Council of Ministers.

By the same deadlines the other USSR ministries and departments that have construction organizations, and the councils of ministers of the union republics, are obliged to develop and approve, after coordination with USSR Gosplan, USSR Gosstroy, and USSR Minfin, respectively the departmental schemes for administration of construction and the schemes for the administration of construction for organizations of republic subordination.

Provision has been made for the development of territorial schemes for the administration of construction, which must be completed no later than the first quarter of 1985.

In order to assure methodological and organizational unity, the appropriate instructions and recommendations have been prepared for developing those schemes for the administration of construction.

When developing the general schemes for the administration of construction, it is necessary to eliminate the multiple administrative levels and to guarantee the transition to two-level and three-level systems of administration:

-- USSR all-union or union-republic ministry to trust;

-- USSR all-union or union-republic ministry to main territorial administration for construction (specialized main production administration) to trust;

-- USSR union-republic ministry to union-republic ministry of union republic to trust.

The departmental schemes for administration of construction also must proceed from the need to change over to a two-level or three-level system of administration.

The elaboration of general schemes for the administration of construction [and of] departmental and territorial schemes for the administration of construction will make it possible to guarantee the proper coordination in the activity of all the contract organizations and their production bases.

The development of our country's economy at the present stage requires the implementation of large-scale construction programs and the use of increasing volumes of capital investments in many areas where there is a lack of the necessary capacities of contract organization and also a lack of their production base. This requires the concentration of considerable construction capacities for a short period of time, and this can be guaranteed only by the efforts of specially created mobile construction subdivisions that are equipped with the necessary means of mechanization, stock warehouse facilities, and prefabricated facilities that can be dismantled and moved. The nature and forms of the activity of these mobile subdivisions in the construction regions that have already been assimilated or in new ones have their specific peculiarities. Our country has accumulated a large amount of experience in the carrying out of large-scale construction operations in the regions of the West Siberian Petroleum and Gas Complex, and the area of the Baykal-Amur Railroad main line. Rather good results, in particular, were achieved by the organizations of Minneftgazstroy [Ministry of Construction of Petroleum and Gas Industry Enterprises], which during the past three years sharply increased the volumes of operations being fulfilled in West Siberia on the basis of the accelerated introduction into production of the latest achievements of science and technology, the improvement of the organization of labor and production, and the guaranteeing of the necessary social conditions. Positive experience in the operation of mobile construction subdivisions was accumulated during the construction of projects in the Nonchernozem Zone of the RSFSR.

The construction ministries are obliged to develop and carry out measures that are aimed at increasing the mobility in construction. For purposes of reducing the periods of time required for the construction of projects situated a considerable distance from the places where the construction organizations are stationed or in unpopulated areas of the country, for constructing Pioneer bases and settlements by their own efforts within short periods of time in new areas of concentration of construction, and for carrying out individual types of special construction and installation operations, it is necessary to reinforce the existing mobile organizations and to form new ones, to equip them with highly productive vehicles, machinery, and tools, means of transportation, prefabricated-dismantlable buildings for production and housing-and-everyday needs, in complete volume.

Recommendations are being prepared to increase the material self-interest of the workers in the mobile organizations.

The successful course of construction is largely determined by the level of organization of construction and the carrying out of operations. The construction ministries and departments, the main territorial administrations for construction, and the construction-and-installation trusts must carry out concrete measures to improve the quality of construction and to intensify the supervision and monitoring of the observance of the norms and rules for the carrying out of operations, and must prevent the carrying out of construction-and-installation operations unless there are draft plans for the organization of the construction and draft plans for the carrying out of operations. For purposes of the further improvement of the work to raise the level of organization of labor and production, provision is being made to create model construction-and-installation organizations for the application of new technology, advanced technological schemes, the complete mechanization of construction, the economizing of material resources, the guaranteeing of the high productivity and efficiency of labor and the high quality of operations, and the introduction of the advanced experience in the carrying out of operations, and also the carrying out, within the next three to five years, of the model construction of a number of projects in various branches of the national economy, with the object in mind being that they should become the standard for the organization of construction and the carrying out of operations.

In accordance with the instructions of the April 1984 Plenum of the CPSU Central Committee concerning the reduction in the number of workers in the apparatus of administration and the expenses to maintain them, a number of construction ministries have been given the responsibility of establishing, in the form of an experiment starting in 1985, the maximum appropriations for the maintenance of the apparatus of administration, proceeding from the quotas for those appropriations per million rubles of volume of operations, as coordinated with USSR Minfin. The purpose in mind is to generalize the results of that experiment and to submit the appropriate recommendations to the USSR government.

For purposes of the further improvement of the economic mechanism in construction, which is aimed at guaranteeing the prompt activation of production capacities and projects, the reduction of construction costs, the

raising of its technical level, and the intensification of construction production, it has been deemed necessary to carry out, beginning in 1985, in three main construction administrations of USSR Mintyazhstroy [Ministry of Construction of Heavy Industry Enterprises], USSR Minpromstroy [Ministry of Construction of Industrial Enterprises], USSR Minsel'stroy [Ministry of Construction of Rural Enterprises], as well as BSSR Minpromstroy and Minsel'stroy, a comprehensive economic experiment that stipulates the expansion of the rights and the intensification of the responsibility of the construction organizations, as well as the increasing of the responsibility of all the participants in the investment process, beginning with the development of the construction-planning and estimate documentation and ending with the turnover of the projects for operation, with the changeover to the construction of a number of projects with turning them over "under lock and key." In 1984 the appropriate preparatory work is being carried out, including the creation of the necessary methodological and instructional materials. Many departments of USSR Gosplan must take the most active part in this important work.

The planning and economic agencies are confronted by a task of tremendous political and economic importance -- guided by the decree of the CPSU Central Committee and the USSR Council of Ministers that was mentioned, they must do everything necessary to achieve the fundamental improvement of capital construction, to increase its effectiveness and quality and to reduce its costs, to gain a steady increase in the labor productivity, to reduce the periods of time required for construction, and to guarantee the fulfillment of the plans for the activation of the capacities and projects. This, in its turn, will promote a situation in which the collectives of construction workers, installation workers, and the other participants in the construction process will make a worthy contribution to the implementation of the program for our country's economic and social development.

5075
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WAYS OF IMPROVING MANAGEMENT OF INSTALLATION WORK SUGGESTED

Moscow SOTSIALISTICHESKAYA INDUSTRIYA in Russian 16 Aug 84, p 2

[Article by B. Bakin, USSR minister of Installation and Special Construction Work: "The Foundation of Rhythm at a Construction Site"]

[Text] By their tenacious labor the multi-million strong army of Soviet construction and installation workers are multiplying the economic potential of our motherland. New industrial enterprises are being put into operation and the reconstruction and modernization of operating factories and plants is being done extensively. The fruitful results of these efforts is obvious. But, as comrade K. U. Chernenko noted when meeting voters, less has been done in this area than is desired.

Why does the situation with respect to capital construction matters not completely meet the requirements by far for a modern level of development of the economy?

As is known, the CPSU Central Committee and USSR Council of Ministers recently approved the decree "Concerning an Improvement in Planning, Organizing, and Managing Capital Construction." In briefly formulating the essence of this document it could be said that the party and government require that the strictest order be observed in such an important sector of the national economy. And this order, it goes without saying, depends most of all on those who directly erect the building and install the equipment.

The fundamental position of the decree is the requirement of an increased role and increased responsibility for the general contractor. "The trust--the general contractor," states the document, "is obligated to ensure the coordination of the activities of all the participants in construction and its resolutions to the problems associated with completing the approved plans and schedules for work are binding on all participants in construction irrespective of their departmental jurisdiction".

Unfortunately, the meaningful words of the general contractors began to be altered by every headquarters. They conduct strategy meetings, dictate the timeframes when and what work is to be done, and by doing this replace the administrators of the general contractor organizations. And then the minutes of the meeting appear which in essence have no legal force. And it is especially bad that sometimes a bad administrator hides behind these headquarters while a good one loses his authority.

The decree increased the responsibility of the organizations in the USSR Ministry of Installation and Special Construction as the subcontractors for putting production capacities and facilities into operation according to the schedule established by the general contractor. We are reorganizing the work of our subdivisions along these lines.

The construction site is always a living organism. It breathes rhythmically and deeply when all of the expected supplies are received on time and in the required amounts. But when it lacks something it begins to wither away. And everything is thrown into the rescue beginning with the crews and ending with the administrator of the highest rank. All of this signifies that the construction site is sick. The diagnosis is insufficient material, technical, design or financial resources.

And it turns out, as in medicine as well, that it is more reliable to prevent the illness rather than treat it. An exact estimate of all the realistic capabilities of the parties that are supervising the construction with the realistic capabilities of those directly participating in it--this is the full sense of the party and government's decree on capital construction which is addressed not only to construction and installation workers but to all who are organically linked to this sector of the national economy--to planning and financing agencies, design and supply organizations, client-ministries and manufacturers of technological and other equipment.

Therefore all participants in construction must do that which is expected of them in strict accordance with the requirements of the construction standards and regulations. It is time to increase the authority of this document as the primary code of laws in construction.

As a multitude of facts testifies, a deviation from the standard technological timeframes brings about serious arrhythmia in organizing construction and installation production and, in the final analysis, inevitably leads to notorious crash work at construction sites or to the complete disruption of the start-up plan. There are as many examples supporting this idea as you would like.

Here is one of them. A complex for producing ammonia at the Kemerovo Production Association "Azot" was included in the start-up plan for the current year. Based on the standards, the completeness of a structure in the year that it is put into operation should be 60 percent while it was only 17 percent at Kemerovo. According to the norms, installation of the equipment requires 20 months. The installation workers did not have such time. Nevertheless, they could reduce the timeframe by a great effort. But the equipment was also incomplete. This case is not the exception but typical. The client, in this case the Ministry for Producing Mineral Fertilizers, knew in advance that the start-up of the Kemerovo capacities would not take place in the established time period but instead the construction and installation workers would be "under pressure" and complete the work the following year and the project would become operational. But this is really a worthless practice. It disorganizes the work of the collectives in the construction and installation organizations, leads to the dispersion of their forces and their

material and technical resources, and inflicts not only economic but also moral damages, for it undermines confidence in the reality of the plans and the socialist obligations that are taken on.

Under conditions for scientific and technical progress and the active adoption of industrial components in installation production, the maximum amount of work must be shifted to industrial enterprises while only equipment that has been fabricated at plants in large units of machinery and assemblies should be installed at the construction site. This is a reliable method of accelerating the start-up of capacities and facilities.

Just how important this problem is is evident from the fact that our subdivisions install approximately three million tons of technological equipment annually. Many tens of thousands of qualified installation workers are compelled to assemble and consolidate it at construction sites.

The expertise obtained by the Petrozavodsk Plant in the Ministry of Chemical and Petroleum Machine Building, which manufactured in its shops and supplied a series of industrial towers each weighing up to 1000 tons in an assembled form for construction of the Tobol'sk petrochemical combine, should be improved and broadly disseminated.

It seems that under current conditions it would be right to establish the following chief and basic indicator for plant manufacturers: the complete delivery of equipment that is completely factory ready and of a high quality; for it is no secret that many machine building and other plants deliver equipment with a great number of defects.

The requirement of the party and government for an improvement in the balance of all material and personnel resources for each starting and closing construction project and for capital construction as a whole can only be completely realized as a result of accurately estimating the production capabilities of each sector of the national economy that participates in the formation of new facilities with its products. When these capabilities prove to be lower than that which is required for the enterprises and shops that are planned to become operational it affects the results negatively.

Again one does not have to go far for examples. Since the beginning of the five-year plan delays and even disruptions have very often arisen at several construction sites in ferrous and non-ferrous metallurgy due to a lack of fireproofing brick. And this occurs due to the fact that existing capacities for producing brick are less than the planned requirements.

Or for another example. In order to protect metal components from corrosion they only prime it when it is manufactured while the final coat is put on at the construction site. This difficult and non-productive work is now being done by thousands of qualified installation workers. Yet a fast-drying enamel has been developed. Its use would make it possible to paint the components right at the plants. Thousands of qualified installation workers would be freed for thier primary work. But the production of such enamel has not yet been organized.

Improving construction efficiency and the timely and steady start-up of fixed production assets--these problems are being solved at many stages of the investment process and, in particular, at the design stage. Our ministry supplies 2.5 million tons of metal components every year. The production capacities which have been built will make it possible to substantially increase their output and to prepare them in shorter periods of time. Other than that we still find ourselves to be insolvent. The fact is that many non-specialized organizations are engaged in designing metal components. The documentation produced by them contains quite a few errors. The technology of manufacturing and standardization of components are not taken into consideration in the drawings. The leading design organization in USSR Gosstroy--the TsNII [Central Scientific Research Institute] for the Design of Steel Components--coordinates the activities of its colleagues poorly. For this reason we do not have the capability of transferring our plants to highly mechanized serial production tracks.

I touched on only some of the problems of realizing the CPSU Central Committee and USSR Council of Ministers decree "Concerning an Improvement in Planning, Organizing, and Managing Capital Construction." Extensive work to study and completely implement this directive document is being done in the subdivisions of the USSR Ministry of Installation and Special Construction Work. We intend to consolidate a whole series of our organizations, make them more mobile, take a more active part in the formation of model and experimental construction sites and, together with the general contractor, work out more perfect methods of managing and producing work here.

All of us have much to do in order to rid ourselves of the burden of past deficiencies and to work out a precise and business-like style of interrelationships.

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NEW BOOK ON CONSTRUCTION FINANCING REVIEWED

Moscow FINANSY SSSR in Russian No 6, Jun 84 pp 67-69

/Review by M. P. Berezina, candidate of economic sciences, of book "Finansirovaniye stroitel'stva v usloviyakh sovershenstvovaniya khozyaystvennogo mekhanizma" /Financing Construction under the Conditions of Improvement in the Economic Mechanism/ by V. V. Ostapenko, V. F. Babak, R. K. Belkina, et al., "Finansy i statistika", Moscow, 1983, 151 pages/

/Text/ The book under review accords its principal attention to the radical restructuring of the forms and methods used for allotting funds to such basic participants in construction as the client-organizations, planning and contracting construction organizations. Examined here are the sources and methods of financing capital investments in industry in proportion to the introduction of sectorial cost accounting, expansion of the scope of re-tooling and modernizing enterprises, and the formation of territorial-production complexes (TPK's). It reflects the problems of financing planning operations and the formation of working capital as calculated for completed planning-and-estimate documentation. The book provides an analysis of the organization and utilization of working capital in the construction industry, the formation of its sources under the conditions of planning and providing economic incentives for this sector in accorddance with end results.

Each problem has been formulated and researched, taking into account the present-day stage of improvement in the economic mechanism. The authors have worked out proposals for augmenting the role played by the financing-credit levers in the investment sphere, and with respect to the economical and effective utilization of monetary assets.

Cited on p 10 is a schematic diagram of the sources for financing capital investments, showing the complicated transformation (with the aid of budgetary and credit systems) of resources from the primary to the derivative (secondary) sources of financing. We cannot understand, however, why the sources have included the turnover tax, which (according to the schematic diagram) is turned into budget allocations for the indicated purpose. When payments are contributed to the budget, including turnover taxes, no provision is made for the targeted use of each of its sources of income.

The schematic diagram should also have shown the inter-relationship between the centralized sources (i.e., those of ministerial scope) and the amortization for

capital repairs, now partially used for financing capital inverstments, as well as the dependence of resources for crediting the latter on the state budget. It would have been feasible to disclose how, in the process of forming financial resources, the dissipation of capital investments to numerous construction projects has been overcome.

Logical, in our opinion, are the conclusions drawn about keying, above all, on the method of financing by means of the sector's (associations') own assets, the necessity for expanding and improving the funding method, as well as the cost-accounting method (on a reimbursable basis) of re-distributing the funds; appropriate recommendations are furnished. While noting the high degree of effectiveness of the credit method of allocating funds for capital investments, the authors, by means of some interesting calculations, demonstrate the feasibility of forming a state credit resource fund for this purpose by means of sources corresponding to the nature (essence) of long-term credit, and, in turn, defining the sphere of using credit, its terms and interest rate by proceeding from the nature of the resources.

This work devotes deserved attention to the following proposals: to utilize the norms of the effectiveness of capital investments in planning the sizes of the profits and their distribution among the sector and the budget; to draw up separate financing plans for production and non-production construction; to secure for the individual new construction projects only the budget allotments for their more effective use (by means of concentrating the resources being set aside for capital investments) and simplifying the financing techniques.

Now recognized as the most economical trends in capital investments are the re-tooling and modernization of enterprises, and, when new regions are being developed--the formation and development of a TPK. Hence, the authors are fully justified in studying the economic effectiveness of investments along these lines and in the problems of financing. By means of a critical analysis of the make-up of operations pertaining to re-tooling and modernization they have revealed the shortcomings in the existing methodology for distributing capital investments by mixed criteria, and they have worked out a new, more detailed classification using individual criteria, including by types of construction, methods of reproducing fixed capital assets (elements and values), the nature and methods of introducing new equipment, as well as the formation of production capacities. The proposed classification, however, is quite complicated and is scarcely to be used in a practical manner. The allocation therein of capital investments for introducing obsolete, run-of-the-mill equipment, keyed to the use of means which are known to be ineffective, seems unacceptable.

The work contains interesting data with regard to many industrial ministries concerning the proportionate share of capital investments in re-tooling and modernization; it examines in detail the targeted sources of their financing from the viewpoint of coordinating the amounts of these investments with amortization for renovation; it thoroughly analyzes the relative sizes of each source of the production development found (FRP) within the magnitude of the given fund and the over-all contributed total of the respective source (amortization for renovation and profits). Correct recommendations are given concerning the singling out within the make-up of the general plan for financing capital investments of sources earmarked for re-tooling and modernization, and

this will allow us to better balance the limits of capital investments for a given purpose with their sources, also with regard to establishing well-founded norms for withholding deductions for the FRP.

The principles of forming a TPK are set forth: the most important groups of the industrial sectors, as well as the production and social infra-structure are included within it. A justifiable opinion is expressed concerning the lack of the necessary coordination between the consolidated plans for the capital construction of a TPK, as drawn up in accordance with the July (1979) decree of the CPSU Central Committee and the USSR Council of Ministers, and the plans for financing capital investments.

In order to ensure a well-balanced, comprehensive planning, construction, putting into operation, and the subsequent functioning of the TPK facilities, it is necessary, in the authors' opinion, to develop general (calculated for two or three five-year plans) construction plans, unified, consolidated, comprehensive, medium-range and annual plans for the planning and surveying work of a TPK, as well as for financing the capital investments for building the designated facilities. Specific proposals are advanced with regard to forming such plans; they must encompass the volumes of work and the sources of financing for the industrial complexes, the production and social infra-structure, and especially the sectors of the agro-industrial complex. In order to further expand the crediting of capital investments for the formation and deleopment of TPK's, they propose that a special fund be created which would combine within the framework of the territorial-production complexes the limits of crediting the ministries engaged in building; they also propose that consolidated, medium-range, and annual plans be drawn up for crediting TPK capital investments.

The authors have justified a number of measures to strengthen the role of finances and credit in improving planning-and-estimate operations. They furnish an interesting analysis of the development during the years 1965--1980 of sources of financing planning operations (as inter-connected with the nature of their performance): funds allocated for capital investments, funds for the basic activity of the economic organs, budgetary allotments, and other sources. Examined here are the most important finance-credit levers, which also affect the activity of the planning organizations: calculations for planning-and-surveying operations, sources and procedure for forming working capital, a system of material incentives. But we cannot agree with certain specific recommendations.

The following proposal seems too complicated for practical application: to differentiate among planning organizations the proportional participation of their own working capital and credit in the formation of incomplete PIR /expansion unknown/ production. The procedure now existing in industry for crediting with proportional participation of their own working capital does not envisage such a differentiation even for individual sectors.

Also unacceptable, in our opinion, is the point of view on the formation of the material-incentives funds of planning organizations mainly by means of assets to be transferred by clients and enterprises in connection with raising the level of planning indicators. While granting the possibility of an increase in the proportion of these assets within the above-mentioned fund, we

consider that its basic part should still be formed by means of profits, which reflect all aspects of planning organizations' activity.

The significant space accorded to the formation and utilization of the working capital of contract organizations is fully justified. The authors have made a detailed study of the growth since 1970 in the structure of working capital and the sources of its formation throughout the entire construction industry, as well as for the seven leading ministries, the status of norm-setting and the preservation of working capital, as well as the indicators showing the effectiveness of its use and reserves for improving it. The analysis of this material has been successfully illustrated by tables, graphs, and diagrams.

The authors touch upon the relatively little studied question of the correlation between the various types of sources for forming one own working capital and that of the contracting organizations comparable to it. Indicated here are the reasons for and the time to begin utilizing each source to cover the needs for their own working capital within the limits of the norms. Deserving of attention are the suggestions of planning creditor indebtedness to suppliers re accounting documents whose deadline for payment has not yet fallen due and on deliveries for which invoices have not yet been received, as well as temporarily available assets from special funds, derived from the lower limit in the variations of their amounts during the base year (the differences between the average chronological dimension and the average linear deviation), as adjusted in accordance with the change in the volume of operations during the plan year. But, while providing in such a way for the possibility of a broader-based drawing in of the indicated sources into the sphere of planning regulation, the authors should have also studied the rightness of the growth during the 1970's by more than double of assets in the form of the above-mentioned creditor indebtedness, and particularly the indebtedness re deliveries for which invoices have not yet been received.

The opinion is justified concerning the feasibility of developing and confirming economically well-founded norms of working capital for the construction ministries and their sub-divisions (p 122) by analogy with the way in which this was carried out in accordance with the decree of the CPSU Central Committee and the USSR Council of Ministers, dated 12 July 1979 re the industrial ministries. We cannot understand, however, why they avoided the question of setting norms for the principal element of working capital--uncompleted construction production. Nor is the given indicator recommended for use in determining the turnover rate of the working capital of contracting organizations (pp 124--125). Unfortunately, there is no elucidation of the question of assets turnover in the unfinished production of construction and installation work or of ways to speed it up. Moreover, the indicated aspects for other elements of working capital (for which norms are set or not) have been examined in sufficient detail, including the tendencies to change various indicators of the turnover rate, factors influencing these changes and reserves for speeding up the rate.

Set forth as one such reserve is improvement in the planning of the working-capital turnover rate. In critically evaluating the merits and shortcomings of the existing methods of calculation, the authors propose, in determining the tasks with regard to speeding up the turnover rate of working capital for which norms are set, to take into account the most important factors affecting

it--the liquidation of above-plan supplies in reserve and the reduction of material expenditures on the production of construction-and-installation operations. The formulas for calculating these factors are given here. Also deserving attention is the refinement of the procedure for defining the task of speeding up the turnover rate of one's own working capital when engaged in the annual planning of the need for it within the process of examining the balances of income and outlays (pp 147--148).

Innovation marks the research on the influences of the sources of forming working capital in production reserve supplies, for the most part, banking credit, on the effectiveness of their utilization. But we cannot agree with the assertion that raising the relative proportion of credit in forming production reserve supplies has not exerted sufficient influence on improving the indicators which show utilization of working capital. The authors ground their opinion on the fact that, at present, a permanent rather than a varying part of the supplies has supposedly been formed by means of credit. In connection with this, they propose that the proportion of one's own working capital in the production reserve supplies be increased by means of reducing the proportion of credit in it to 5.5 percent. In our view, the given proposal and its justification are not right.

As practical experience in the crediting of contracting organizations with production supplies has shown, at the present time the proportion of this credit is obviously insufficient. The above-indicated credit is frequently replaced by payment credit, by means of which as much as 80 percent of the material valuables coming in to contracting organizations is paid for. The authors' assertion that loans for reserve supplies are, in a practical sense, not repaid but are merely systematically reformulated and become a source of non-declining, permanent remnants of values, is incorrect. The characteristics of crediting by the remnant must be taken into account; herein the terms of repaying the loan depend not on the length of time required for each turnover of assets, invested in the project being credited (as occurs in the case of turnover crediting). As a rule, they come due only when there is an excess in the outlay of valuables over the new, incoming goods, after which a reduction in the remnants will occur.

The book under review is a serious study of the present-day problems of construction; it is of interest to scientific and practical workers, to those engaged in studying the questions of planning and financing capital investments.

2384
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PLANNING 'PRODUCTION INFRASTRUCTURE' FOR INDUSTRIAL CENTERS

Leningrad Experience

Moscow SOVETSKAYA ROSSIYA in Russian 25 Apr 84 p 1

[Article by A. Platunov, chief of a department of the Main Administration of Capital Construction of the Leningrad City Soviet Executive Committee: "The Industrial Center of the City"]

[Text] What is an industrial center? It is several enterprises which are built in a city or rayon. But the gist of the matter, of course, lies in not only the territorial attributes. A so-called production infrastructure: engineering support facilities, transportation arteries, communications lines and much more, is necessary for any new enterprise. To construct plant buildings in isolation means to spend money again each time on an autonomous infrastructure. Industrial centers are recognized as the most advanced method of building, because common heat and electric power stations, roads, sidings, waste treatment facilities and so on are built for the entire group of enterprises. Thus, the expenditures on ancillary facilities are reduced by approximately one-half, additional resources are freed and time is gained.

And now grouped industrial construction has already passed the 20-year mark. It is a considerable period. Substantial experience has been gained not only in the development of industrial centers, but also in their operation. New, even larger subdivisions--industrial zones--have appeared in several oblasts. In Leningrad, for example, more than 250 enterprises, which belong to 70 ministries and departments, have been united in 6 such zones of development. More than 1 billion rubles are being allocated for their development, including about 200 million rubles for the construction of facilities of common use. But here is the situation: whereas the growing enterprises have absorbed about half of the capital investments, only one-fourth has been assimilated at facilities of the infrastructure.

A strange situation has formed. The very obstacles, which should have collapsed under the mighty authority of grouped construction: departmentalism and isolation, are arising at industrial centers, at which cooperation and the combination of efforts have been proclaimed the basic principle of the relations between the partners. And even the very honorable length of service of these industrial centers is turning into a different aspect of it--it is

revealing the perennial debtors, who evade the financing of facilities of the infrastructure. For example, in the Obukhovo industrial zone it is envisaged by the scheme of the master plan to expand the boiler house, which supplies heat and process steam to more than 30 enterprises. The cost of construction is 15 million rubles. However, only 1.2 million rubles were received from the related enterprises which are extremely interested in heat supply. The unfinished boiler house had to be excluded from the 11th Five-Year Plan, "in connection with the lack of capital investments...." But production buildings meanwhile are growing, and each ministry has the assets for their construction. Why is it turning out this way?

Let us imagine one of the industrial rayons of the city, where several developing enterprises are concentrated. All the ancillary facilities for them are taken into account in the scheme of the master plan--this document implies that the industrial center has been formed and it is possible to develop it. Here it is very important that the placement into operation of facilities of common use would lead the construction of the enterprises themselves and the assimilation of their production capacities. Such a procedure is legalized by special executive documents.

Another important thing is financing. All the common facilities are built by means of capital investments of the enterprises which belong to the industrial center. The corresponding ministries and departments allocate assets in accordance with the principle of proportionate participation. No other sources of financing exist here. The main builder carries out the construction. As a rule, this is the largest enterprise in the construction center, which has more extensive opportunities.

The process of attracting "shareholders" is a lengthy, multiple-phase one. First there is an agreement at the level of deputy ministers, in order to determine the specific amounts of proportionate participation. Then there is the approval of the scheme of the master plan, without which the main builder cannot begin a single project. Then the thrilling moment of the immediate transfer of shares begins: together with the managers of the future enterprises the main builders draw up protocols, send them once again to the appropriate ministries, while they, in turn, send them to the RSFSR and USSR State Planning Committees. And only after this are the documents sent in the opposite direction and included as a component in the national economic plans.

How much time is spent on the getting of all kinds of official stamps and forwarding? The arithmetic here is simple: if, let us assume, 1 year is envisaged as the standard period for the construction of common facilities, 4 years are required for the drawing up of all the documents of proportionate participation! And this is strictly according to the scheme. The many years of experience of the cooperation of shareholders also do not leave similar illusions. At the stage of coordination the unforeseen losses of time are already growing like a snowball. Union ministries--of the electrical equipment industry, transport construction and others--"think over" for several years their proportionate participation in the building of industrial centers. Republic ministries--the Minister of the Textile Industry, the Ministry of the Meat and Dairy Industry, the Ministry of Motor Transport--are

also not inferior to them. Their total debt to the industrial zones of Leningrad comes to about 50 million rubles!

Even when the formal aspect of the solution is behind, the shareholder departments are in no hurry to meet their obligations to the partners. Protocols for the combination of 10.4 million rubles were signed 3 years ago at the Leningrad industrial centers. In fact 3.7 million rubles were transferred. In subsequent years the shortfall of assets with respect to production cooperation also came to many millions of rubles. Is it possible to change the existing procedure, which gives rise to such chaos? It seems that it is possible. In the same Leningrad the first attempts were made to normalize the relations of related enterprises in the industrial centers and zones: for several years now not the individual enterprise, but the Leningrad City Soviet Executive Committee, its Main Administration of Capital Construction and Main Administration for Fuel and Energy have acted as the main builder of all the centerwide facilities. It is an exceptional case, which for the present does not have analogues in other cities of the country. The experiment is justifying itself: the organization of the development of industrial zones has improved, the amount of capital investments being assimilated has increased by three- to fourfold. The experience of Leningraders, just as the example of the Georgian city of Poti, is acquiring particular importance in light of the documents of the April CPSU Central Committee Plenum and the recent session of the USSR Supreme Soviet, at which particular attention was directed to the increase of the role of the local soviets in the management of the socioeconomic development of regions. It seems that practice has gained sufficient experience, which merits interpretation in the central departments.

Not that long ago the USSR State Committee for Construction Affairs and the USSR State Planning Committee approved the new Statute on the Procedure of the Formation, Designing, Planning and Financing of the Construction of a Group of Enterprises With Common Facilities (the Industrial Center). It is aimed at the streamlining of the system of the transfer of proportionate assets. But everything that has been done so far is of local, auxiliary importance, for the most vulnerable link--the endless labyrinths of agreements--remains unchanged. And as before the responsibility of each participant in the construction to the related industries is lost in these labyrinths, while the fate of a large industrial center still depends in the same way on the promptitude and the level of efficiency of the partnership of any sectorial ministry. For even if we assume that of the 30 enterprises all except a single one will be disciplined and obliging in their decisions, the picture in essence will almost not change: for the present the last partner will not go shares, the construction of common facilities at the industrial center will not start. And are the specific proposals of the Leningrad City Soviet Executive Committee, which have been worked out in detail by years, of much real use, if they should be considered in advance in 70 ministries and departments?

Here is a typical example. Water intake works and a system of the technical water supply of enterprises with a total cost of about 10 million rubles are envisaged for several industrial zones of Leningrad--Northwestern, Kolomyagi and Parnas. It would seem that the procedure is well known: first of all it

is necessary to transfer the proportionate assets. However, with this skidding also begins. For the present not one structure of this system is being built: this is not the first year that the related industries have "coordinated" their actions with the ministerial services. But the Vodokanal Administration continues to release daily tens of thousands of cubic meters of the purest drinking water for production needs. Is this not mismanagement?

Today more than 500 industrial centers--the most important construction complexes of our industry--have been built in our country. Practical experience shows that not everything is yet even and smooth in this advanced means of the development of the economy. Apparently, the need is ripe for the broader and more thorough examination of the experience, both domestic and foreign, which has been gained in 20 years. And first of all it is necessary to fulfill precisely the demand which was advanced by the 26th CPSU Congress: to elaborate uniform principles of the development of territorial production complexes and industrial centers and the intersectorial management of them.

Problems in RSFSR

Moscow SOVETSKAYA ROSSIYA in Russian 8 Aug 84 p 3

[Article by V. Perekatov, chief specialist of the RSFSR State Committee for Construction Affairs (Moscow): "The Industrial Center"]

[Text] The problem, which A. Platunov, chief of a department of the Main Administration of Capital Construction of the Leningrad City Soviet Executive Committee, examined in his article ("The Industry Center of the City," SOVETSKAYA ROSSIYA of 25 April 1984), is among those which become more and more urgent, if steps are not taken for its solution. In what is the particular urgency of the streamlining of the planning and construction of industrial centers? First of all in the fact that the process of the concentration of industry is continuing, while gaining speed--plants, factories and combines are being arranged more and more often in "clusters," in the vicinity of each other. Naturally, it is an unprofitable matter to build for an enterprise an autonomous infrastructure--warehouses, communications lines, transportation arteries and so on. Industrial centers are also called upon to unite the efforts of builders and to develop an efficiency system of facilities which serve the needs of a group of enterprise. Many obstacles, the main one of which is the isolation of the participants in the construction of industrial centers, are in the way of their extensive dissemination.

Much here is dictated by an old tradition: in old cities, with an established housing system, the master plan of their development and the planning of industrial centers have existed for many years as if at different poles. Today different planning organizations, at different times, are performing this work, even the approval of the plans takes place in different instances. For example, the Main Administration of the State Expert Review of Designs and Budget Estimates for Construction Work of the USSR State Committee for Construction Affairs reserves for itself the planning and financing of the facilities of industrial centers, the share of which in the total amount of planning work of the RSFSR State Committee for Construction Affairs comes to

less than 5 percent. Unfortunately, in this case it is also carried out in isolation of the work on the master plan of cities.

It is a natural question: Who more than other instances is interested in the streamlining of industrial development and the building of reliable service mains, which would simultaneously meet the needs of industrial enterprises and city municipal services? Of course, the local soviets. But today the executive committee of the local soviet is forced more and more often to be a solicitor, and far from always successfully. For example, not that long ago the streamlining of the industrial development of Yoshkar-Ola, the city of Bor of Gorkiy Oblast and other cities was rejected. On what grounds? It is difficult to convince two instances--the territorial planning institute and the Main Administration of the State Expert Review of Designs and Budget Estimates for Construction Work of the USSR State Committee for Construction Affairs. But they, too, are only the beginning of the lengthy transformations of future construction: the Main Administration of the State Expert Review of Designs and Budget Estimates for Construction Work plans the development of industrial centers, the Main Administration of the Construction and Planning of Industrial Enterprises or construction ministries finance it, while the RSFSR State Committee for Construction Affairs approves the assignment for development.

It is clear that in such a situation it is very difficult to determine, who is the boss of the industrial center, who bears full responsibility for its fate. As a consequence, the planning period is dragged out for years. That is how it happened, for example, with the drafting of the plan of industrial development in the cities of Kolomna and Yegorevsk and the settlement of Tuchkovo of Moscow Oblast. The plans are becoming obsolete and are losing their practical value. Thus, the plans of the industrial centers in Podolsk (Moscow Oblast), Syzran (Kuybyshev Oblast), Tuymaza (the Bashkir ASSR) and many other cities have been transferred to the archive. In the past 18 years about 400 plans of industrial centers have been formulated in the RSFSR, but the need for them is many times greater. If the state of affairs in this sphere does not change, many decades will be required for the provision of the cities and settlements of the RSFSR with planning documents.

What seems most ripe and necessary? In our opinion, the RSFSR State Committee for Construction Affairs needs to plan the designing work for industrial centers, while the local soviets should assume the functions of the clients. In the opinion of specialists, the master plans of cities will then acquire great economic soundness, their layout and structure will be improved and a significant step will be taken in overcoming the harmful isolation between industrial and residential development.

Moreover, the building of industrial centers needs a reliable legal basis, constant attention and checking on the part of the central planning organ. The now prevailing statute on the procedure of the planning, designing and financing of the construction of facilities for a group of enterprises (the industrial center) was approved by the USSR State Committee for Construction Affairs and the USSR State Planning Committee in April 1976, and then again 6 years later. But in the current wording the document is also not free of substantial shortcomings. For example, according to its standards the design

organizations should spend the first year of the five-year plan on numerous consultations with ministries and departments. About 2 years are spent on the drawing up of the documents and on the coordination of decisions. The main builder needs not less than a year for the enlistment of the shareholder ministries in construction and for the drawing up of the working drawings. In this way or in approximately this way 4 years pass. As a result equipment is not ordered, the construction of facilities is not started.

In accordance with the instructions none of the shareholder builders should take steps on the designing and the beginning of the construction of their "own" enterprises, they are obliged to way until the development of the industrial center is completed. But, as a rule, the majority of ministries carry out construction all these 4 years, directing their attention, naturally, to individual engineering support. By the time of the approval of the plan of the industrial center the builders frequently have to adjust and reapprove the planning estimates of the facilities of basic production, or else halt their construction. As a result industrial centers are disintegrating, having failed.

In our opinion, a change of the procedure of the formation of industrial centers, which envisages a lead time of their development, would be of appreciable benefit. They should be designed not for the current, but the next five-year plan. Of course, the plans of industrial centers should find their place in the five-year plans of the economic and social development of the country and be substantiated and approved by the union or republic State Planning Committee. Moreover, this should be done on the basis of the sectorial schemes of the location of industrial enterprises. It is necessary to replace the allotment of a site for the construction of one enterprise or another with the selection of the territory for a group of enterprises and only on the basis of an intersectorial industrial center.

I would like to dwell on another problem. Many specialists believe (in world practice such experience exists) that it is necessary to form, develop and build centers for reserve, for the future. The building of facilities common to the entire industrial center should lead the construction of the industrial enterprises themselves. Incidentally, the local soviets carry out in precisely this way the designing, construction and operation of engineering support facilities of cities and settlements--water supply, sewers, communications and so on. The need is ripe to concentrate in the hands of a single client--the executive committees of the local soviets--the construction of the engineering support facilities of both the residential and the industrial zones of the city by means of centralized capital investments, with the subsequent compensation of the expenditures by the building ministries which are a part of the industrial center. In case of such a procedure of the financing and construction of citywide facilities the need for the agreement and the transfer of the assets of the shareholder ministries will disappear, the reliable monitoring of the construction of the facilities, which are needed by industry of the region, will be guaranteed.

I foresee a question: Will the construction of engineering support facilities "for reserve" not lead to the freezing of capital investments? It seems that such apprehensions are unwarranted. The allocations for engineering

structures come to only 10-15 percent of the estimated cost of the basic enterprises of the industrial center. But the main thing is that the possible economic costs will be covered with interest by the timely placement into operation and the full utilization of the enterprises from the day of their startup. Practical experience shows that the freezing of capital investments occurs more often due to a delay with the construction of engineering networks and structures. Apparently, the need is ripe, although as an experiment, to check out the construction of industrial centers. In this connection it is worthwhile for the central planning organ to generalize the experience of the Leningrad City Soviet Executive Committee, which for a number of years now has been coping successfully with the functions of the main builder for engineering support facilities of both the residential and the industrial zones of the city.

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HOUSING CONSTRUCTION

CONFERENCE ON PREFABRICATED HOUSING HELD IN GSSR

Tbilisi ZARYA VOSTOKA in Russian 25 Jul 84 p 2

[Article: "Industrialization Begins At the Site; An All-Union Conference on Modular Section Housing Construction Opens Today in Tbilisi"]

> The theme of the conference that was organized by USSR Gosstroy, the USSR State Committee for Civil Construction and Architecture, the USSR Ministry of Rural Construction, GSSR Gosstroy, and the GSSR Ministry of Rural Construction, is "The on-site method of manufacturing modular sections for housing construction." Leading specialists and scientists from Moscow, Kiev, Tashkent, Minsk, Riga and other cities in the country will participate in it.
>
> This conference, which will continue until 27 July, is not being held in our republic by accident. A certain amount of expertise about modular section housing construction has been accumulated in Georgia. First Deputy Minister of the GSSR Ministry of Rural Construction Shota Lomidze talks about this expertise and the goals of the forum at the request of a correspondent of ZARYA VOSTOKA.

In order to successfully complete significant amounts of massive construction in mountainous and rural regions of the republic including the erection of high-rise and low-rise housing units, hospitals, polyclinics, and other public health projects, facilities for sanitation and resort purposes, agricultural production buildings--cow barns, purifying structures, and projects for public purposes--schools, children's institutions, commercial and everyday enterprises and others, a constant improvement and an increase in the efficiency of construction methods--in particular a more industrialized method is required for modular section housing which is especially urgent under the conditions of a growing deficit of labor resources.

The Soviet Union is rightfully considered one of the originators of industrialized methods of housing construction and its more advanced forms of completely prefabricated housing construction, one of the varieties of which is modular section housing construction. The theory behind this efficient method of erecting housing units consists of consolidating installed

components, the majority of which--up to 80 percent--are manufactured under mechanized and automated plant production conditions.

Practical work, which characterizes the current level of the development of this method in the republic, was begun in the GSSR Ministry of Health's system in 1974 when a portion of a two-story hospital building was built in Tbilisi.

The expertise gained in erecting the first portion met with favor in the government of the republic and in May 1975 the GSSR Ministry of Health was commissioned to implement the design and construction of a modular section regional hospital with 75 beds in Pasanauri. The two-story hospital building was built in six months in 1976. The modular sections were manufactured at a special site.

Almost simultaneously in 1976 and 1977 a two-story sanitation and epidemiological building was built in Mtskheta and a recreation base consisting of a two-story four-apartment housing unit was erected in the village of Tskhneti from the very same maodular sections.

After evaluating the positive results of the first stage of construction, the GSSR Council of Ministers commissioned the Ministry of Health in September 1976 to begin the design and implement the experimental construction of a large hospital complex with 332 beds and a polyclinic designed to accomodate 600 visits a day from modular sections in Gurdzhaani which became operational in 1983.

The goal of the experiment was to work out the technology to manufacture modular sections by the on-site method which proved to be expedient under the climatic conditions in the republic and the new structural approaches to the building. All the facilities at the hospital complex in Gurdzhaani were designed and built from modular sections and manufactured directly at the construction site.

After construction was completed in Gurdzhaani a large portion of the equipment from the manufacturing site was relocated to Marneuli where construction of a six-story interregional hospital with 500 beds and a polyclinic designed to accomodate 800 visits was begun in 1983.

Construction of the buildings was accompanied by a series of experimental tests conducted by the TsNIIEP [Central Scientific Research Institute for Experimental Design] of Housing, and the Tbilisi ZNIIEP [not further identified], including dynamic testing of the seismic stability of a full scale portion in Gurdzhaani with the aid of a vibration machine, static testing of the modular sections that were transported from the construction site to Tbilisi at the Tbilisi ZNIIEP base, tests on the heat and sound insulation, and also a technical and economic analysis. These measures, on the whole, confirmed the expediency of the technical approaches that were taken and helped to develop recommendations for improving them.

Experimental construction showed that in comparison with typical approaches for a similar hospital, erection and overall labor costs for the structural

framework were reduced accordingly by 15 to 20 percent, the consumption of steel by almost a factor of 2, the estimated cost by 3 to 4 percent, and specific capital investments by no less than a factor of 3.

In 1980 the GSSR Ministry of Rural Construction, which became the leader in developing this method, began work on a search for efficient technical approaches to erecting housing units and structures for production purposes in rural locations. At the present time several experimental farm-type housing units, cow barns and purification structures have been built. A number of other buildings have been designed.

Along with the well-known successes in this experiment that are very important for the republic, serious difficulties have arisen associated with delayed and insufficient supplies of materials and technology which has at times delayed the start of operations of projects that are under construction and reduced their economic effectiveness. Up to now there are no economically effective designs for rural-type housing that the republic Gosstroy could approve.

The work done by a number of organizations and departments in the republic have not been linked by a common coordinated plan.

The All-Union Conference on Modular Section Housing Construction that begins today is called on to correlate the expertise that has been gained, to discuss the positive achievements that exist, to uncover deficiencies, and, most importantly, to formulate recommendations for improving and increasing the economic efficiency of this new method of housing construction in our republic and other southern regions of the country.

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USE OF POLYMER CONCRETE DISCUSSED

Moscow BETON I ZHELEZOBETON in Russian No. 8, Aug 84 p 3

[Article: "P-Concrete in Industrial and Civil Construction"]

[Text] The resolutions of the 26th Party Congress, and subsequent plenums of the CPSU Central Committee, and the CPSU Central Committee and USSR Council of Ministers' decree "Concerning Measures to Accelerate Scientific and Technical Progress in the National Economy" have determined the principal directions for the development of the construction industry to reduce material and energy consumption and labor expenses, and to improve the durability of construction components. A large role in resolving these important problems is being given to concrete and reinforced concrete, the cost of which amounts to about 25 percent of capital construction.

However, it is well known that the length of service of reinforced concrete construction components at chemical, petrochemical, ferrous and non-ferrous metallurgy enterprises, and many other sectors of industry amounts to less than five years in a number of cases. Various methods of chemically protecting such components are involved, labor consuming, and insufficiently reliable.

One of the effective methods of substantially increasing the longevity of construction components at industrial enterprises having highly aggressive reactions in various technological means is the efficient use of polymer concrete.

Based on the classifications worked out by the NIIZhB [Scientific Research Institute for Reinforced Concrete] the following principal groups are distinguished:

- polymer concrete from various polymer adhesives;
- polymer silicate concrete (concrete primarily from liquid glass with polymer additives);
- concrete polymers (concrete impregnated with various monomers or olgomers);
- polymer cement concrete (cement concrete with polymer additives);
- sulfuric concrete and concrete impregnated with sulfur.

Polymer concrete and highly durable polymer silicate concrete possess great strength (80 to 120 megapascals or more), are chemically resistant to the majority of highly aggressive agents, do not require additional chemical protection, and consume less labor and energy.

Polymer concrete is related to those materials that are derived from the more expedient and effective use of polymers that are still costly and in short supply. They are made up of 5 to 10 percent polymer adhesive with the remaining portion made up of fillers and additives. To this must be added that polymer compounds were recently developed that possess dielectric and electric conducting properties, are resistant to various types of radiation and have a nice decorative appearance.

Polymer silicate concrete is equal to polymer concrete in many indicators and is less expensive compared to it. Therefore, these two types of concrete have been widely used in construction practice.

A significant amount of experience has already been gained in the use of polymer concrete for chemically-resistant components, electrolysis and pickling baths, decorative and finish tiles and others. More than 10 shops and plants have been built for manufacturing polymer concrete products and components, including 2 shops in Krasnoyarsk Kray, Ust'-Kamenogorsk, Ashkhabad and Tallinn.

On the basis of overall research and the results adopting it experimentally in industry an album of working drawings for products and components from polymer concrete and polymer silicate concrete was worked out by Giprotsvetmet, Goskhimproyekt, and the Proyektkhimzashchita Institutes in collaboration with NIIZhB, MIIT [not further identified] and others. A number of typical components was approved by the USSR Ministry of Nonferrous Metallurgy and coordinated with USSR Gosstroy.

The first standard documents in world practice were worked out: "Instructions for Designing and Manufacturing Vat Apparatuses from Protected Polymer Concrete" (VSN 01-78, MTsM [not further identified] USSR, 1979), "Instructions for the Technological Production of Polymer Concrete and Products from Them" (SN [not further identified] 525-80, 1981), GOST 25246-82 "Chemically Resistant Concrete. Technical Conditions.", GOST 25881-83 "Chemically Resistant Concrete. Methods of Testing." and others.

Sulfuric concrete and concrete impregnated with sulfur are extremely promising. This material must be given more attention. Sulfuric concrete is obtained by technology used for asphalt by replacing bitumen with commercial sulfur. It possesses comparatively high strength (up to 50 megapascals) and a high chemical resistance to a number of aggressive agents. Sulfur is substantially cheaper than polymers (60 to 65 rubles per ton) and therefore sulfuric concrete is also cheaper than polymer concrete and, although it has a lower strength, its range of use is significantly broader.

Concrete impregnated with sulfur has a compressive strength of up to 100 megapascals and is no worse than concrete impregnated with various monomers in a number of other indicators. At the same time the technology for impregnating concrete with sulfur is simpler than for impregnating it with monomers.

The experimental industrial adoption of concrete impregnated with sulfur in L'vov (sidewalk slabs and silo tower components) and in Tbilisi (vineyard

bracing and lattice for livestock complexes) has shown its high level of effectiveness.

Polymer concrete is receiving much attention in foreign countries (FRG, USA, Japan and others). They are most effectively used for producing chemically-resistant pipes in the electrotechnical, machine tool and machine building industries. For example, the production of polymer concrete pipes amounts to 60,000 tons annually in Japan, the Swiss firm of "Shtuder" began the serial output of polymer concrete casings for high precision machine tools, and in the USA a number of firms are turning out polymer concrete pipes, electric insulation and others.

In the current issue of this magazine articles by the leading specialists in the field of using concrete with polymer additives are presented. Questions about the theory of selecting the optimum compounds, and methods of estimating, designing and industrially adopting such concrete in various sectors of construction are illuminated in more detail in the articles.

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