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USSR Report

CONSTRUCTION AND RELATED INDUSTRIES

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31 December 1985

USSR REPORT

CONSTRUCTION AND RELATED INDUSTRIES

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CONSTRUCTION PLANNING AND ECONOMICS

STATUS OF RURAL CONSTRUCTION IN KAZAKHSTAN REVIEWED

Alma-Ata SELSKOYE KHOZYAYSTVO KAZAKHSTANA in Russian No 2, Feb 85 pp 34-35

[Article by Yu. Parfiryev, chief of the technical administration of the KaSSR Ministry of Rural Construction, under the rubric "Rural Construction": "On the Industrial Base"]

[Text] An important role in solving large-scale tasks in the implementation of the Food Program and in further advancing agricultural production is assigned to the collective, made up of several thousand people, of the Ministry of Rural Construction (Minsselstroy).

Today Minsselstroy is a large industrial sector, capable of solving complex tasks. In the four years of the 11th Five-Year Plan, the volume of construction and installation work exceeded 2 billion rubles. A large number of elevators, livestock breeding complexes, poultry plants, hothouse combines and enterprises for the production, processing and preservation of agricultural produce, built with the application of new technical approaches, were put into operation. During this same time, rural workers received about 2 million square meters of living accommodations. Several dozen schools and professional technical schools, hospitals and polyclinics, and children's preschool institutions were built.

A further increase in the pace of contract work will require an accelerated introduction of the achievements of scientific and technical progress.

In construction for agricultural production purposes, a fundamental trend in technical progress is the high-volume use of light industrial structures based on light-weight concrete, asbestos cement and glued wood, the production of which is organized at existing enterprises. With the use of these structures, more than 1 million square meters of production building area is put up annually. Today 70 percent of these is built out of prefabricated materials.

The utilization of light structures lowers labor costs to nearly one-half, and decreases the volume of hauled freight to as little as one-third to one-fifth. These are enormous reserves for the acceleration of project construction. For example, ministry organizations use about one-half million square meters of asbestos-cement wall and roof safety constructions; this decreases the wall

mass, in comparison with the traditional small-unit materials, to almost one-tenth, and the labor costs to one-fourth. The range of use for asbestos cement varies. Besides roofing, it is used for large flat sheets, materials produced by the length ["pogonazhnyye izdeliya"], extruded wall panels and roof partitions--the latter including a supporting structure and at the same time serving as a covering.

There are enterprises in the country which have production lines for making such structures. It would be advantageous to accelerate the organization of manufacturing such structures at one of the republic's enterprises.

In recent years the construction of buildings primarily of frame design with spans of 12-18-21 meters and a frame spacing of 6 meters has become extremely popular. This is being practised in Alma-Ata, East Kazakhstan, Karaganda, Kzyl-Orda, Kokchetav, Pavlodar, Semipalatinsk and Tselinograd oblasts and enables us to lower labor costs on one building to 98 man-days.

Cartridge devices for the production of semi-frames are manufactured centrally at the Tselinograd Construction Combine and are received with the cooperation of enterprises of the USSR Minsselstroy.

Before the end of the five-year plan, the construction of frame structures is scheduled to be put into broad operation.

The Kapchagay Rural Construction Combine, which erects buildings with a high percentage of prefabricated materials, has achieved good results in the industrialization of construction.

Here prefabricated faces, partitions, tambours, troughs and feed passages and pile-foundation units have been introduced.

If labor costs for constructing an 18x72 meter building were formally 1,950 man-days, labor input has decreased to 300 man-days as a result of the introduction of industrial structures and goods. The Kapchagay Rural Construction Combine is the experimental model enterprise in our system; here everything new and advanced will be introduced and worked out.

Builders and designers at the Kazgiproselkhoz Institute are doing work to reveal the technical possibilities for increasing the use of prefabricated materials in auxiliary utility buildings that go into the makeup of complexes, their interconnections and the unification of constructions.

Worthy of attention are the design proposals for constructing storehouses for mineral fertilizers, with the utilization of prefabricated reinforced concrete semi-frames for building spans 18-21 meters of increased height, developed by the Alma-Ata affiliated branch of the TsITEPselkhoz Institute and approved by the USSR Minsselkhoz. They provide a system for unloading fertilizers by a gravity method, the preservation of technology for mechanized loading and unloading work, the reduction of the building's construction volume and a decrease in the outlay of concrete and steel reinforcement.

The possibilities for constructing storehouses for mineral fertilizer from glued wood structures have not yet been exhausted. Petropavlovsk has the capacities for constructing them but these are not yet fully exploited.

Basic measures for increasing the use of prefabricated materials in agricultural buildings are projected up to 1990, in terms of the volume of construction as well as the technical equipping of organizations and the development of the fundamental production basis. The task is to see to it, with the cooperation of customers and design institutes, that projected construction trends are realized. As a result of these measures, we may estimate the reserve of labor costs in an additional increase of work volume on the order of 18-20 million rubles.

The party and government have set great tasks for rural construction connected with further transforming villages, increasing the construction of housing and of cultural and domestic services facilities, and creating conditions for the consolidation of the labor force. In solving them, the ministry, together with KaSSR Gosstroy [State Committee for Construction] and the customers, will follow the course of creating settlements with a collection of projects needed for various purposes -- residence buildings with personal plots and yard buildings, schools and children's preschool institutions, shopping centers, domestic services combines, clubs, engineering systems and other structures. A number of settlements constructed on this plan were awarded diplomas and medals of the USSR Exhibition of Economic Achievements as a result of the All-Union Inspection Competition, while the overall construction of the Zelenyy Bor settlement in Kokchetav Oblast was awarded the 1984 prize of the USSR Council of Ministers.

One of the main conditions for fulfilling the scheduled projects of civil housing construction is the industrialization of it. In view of this, a number of practical measures are being implemented in the system. As a basis for semi-prefabricated construction, large claydite-concrete blocks and panels in the series 17, 25, 46, 48 209, II-04 (IIS-04) have been adopted.

In recent years, together with the TsNIIEPgrazhdanselstroy Institute, we have been working to adjust model projects of the prefabricated slab series 17. And as a result, the range of products has been almost cut in half. From one and the same type of block one can build schools and kindergartens of various sizes.

The simplicity of manufacturing, transporting and assembling buildings confirms the economic efficiency of their use in rural construction. If the labor input for one square meter of general area of a residential building of brick construction amounts to 3.7 man-days, that figure is reduced to 2.9 if it is built of large blocks. A team of 6 men assembles a two-apartment residential building in 3-4 days.

Today the ministry has at its disposal capacities for producing 130,000 square meters of components for large-panel residential construction and 111 thousand square meters of claydite-concrete products. However, much is still to be done toward increasing the volume of totally-prefabricated construction in housing and in social, cultural and domestic services facilities.

First of all, we must utilize the capacities we have to the maximum. Often plants are not provided with orders for residential building construction, especially in the cities of Dzhambul, Taldy-Kurgan and Uralsk.

No less important in the near future is to convert to a total output of structures and products of high quality and ready to be used as they come from the plant. This will not only guarantee a cut in on-site costs for hand work and provide appropriate quality, but will also ensure the creation of maximum convenience for village workers in their homes. This task is multi-faceted, and its accomplishment requires daily attention to the questions of planning improvement, engineering preparation for production, strict observation of technical discipline, and instilling in workers a sense of responsibility and pride in the building profession. It was precisely upon this that attention was focused in the decree adopted by the CPSU Central Committee, "On the Building Brigade Leaders' Letter in the Newspaper PRAVDA: A Word about the Honor of the Construction Worker."

The work of builders and designers to increase the industrialization of rural residential construction is defined in the over-all program, "The Rural Building," which embraces a whole series of questions about developing new and improving current model projects, about regulating them and developing a basis for totally prefabricated house building. Last year alone 240,000 square meters of residential buildings of an industrial type with a proportion on the order of 45 percent were put into operation. And in the future this indicator is slated to be as high as 60.

Work oriented to adjusting and developing new technical approaches in buildings and social, cultural and domestic services projects is being carried on in cooperation with the Kazgrazhdanselproyekt Institute.

The large-panel house-building plant in Taldy-Kurgan is developing an output for farm type housing of series 48, including prefabricated verandas, pediments and reinforced concrete beams. These projects will be used in the Dzhambul plant as well. This means that for every square meter of area the labor input is reduced to 0.5-0.8 man-days, compared with earlier investments in the project.

A new series of residential buildings has been developed in one- and two-story types built of single-layer claydite-concrete panels for seismic shocks of 8-9 points. They are currently being used in the Alma-Ata Oblast.

Of interest are the buildings with apartments of 3, 4 and 5 rooms built of 6x3- and 6x4-meter concrete box units blanketed in foam plastic. Following sketches from the KazpromstroyNIIproyekt Institute, two devices for making box units have been manufactured which enable us to turn out products of any geometrical proportions. Out of these, 9 experimental buildings have already been constructed. A team of 4 men assembles a building in 2 days, and all together, with finishing work included, it takes 15-20 days.

And all this is being exploited by the Kazakh Communist Youth Union of the Almaatyselstroy-7 Trust. Nor should we disregard another kind of construction -- slab house building.

Together with the republic Gosstroy, we have authorized a program for constructing farm-type buildings in Alma-Ata, Dzhezkazgan, Kokchetav and Kustanay oblasts. For these purposes Finnish plywood has been received and building designs have been chosen.

Worthy of attention is the construction of frameless schools and kindergartens out of large panels in accordance with the experience of the Kalinin House-Building Combine. Following this principle, the Petropavlovsk administration has built five schools for 464 pupils in the last two years.

The ministry's elevator builders have made a great contribution toward improving design approaches. Here the use of prefabrication in projects and structures for preserving and processing agricultural produce has been high, up to 92 percent. Prefabricated and prefabricated-slab foundations are being used in buildings along with an efficient arrangement of elements inside silos.

An increase to five levels in the silo portion of the Semipalatinsk elevator, as a result of lowering the floor beneath the silage, has enabled them to nearly double the storage capacity. The labor costs for one ton of volume has been reduced to 1,270 man-days.

In the erection of elevator complexes in Zholoman and Zhangiz-Tobe, construction of interlocked buildings for auxiliary utility purposes has been realized, which enables us to lower labor costs to 750 man-days and to decrease the size of engineering networks substantially.

For the first time the Vostokkazselstroy-24 Trust has utilized bore-cast piles (1 meter in diameter and with a placement depth of 18 meters) in building silo structures in the Tavricheskiy Rayon. This has made it possible to lower the materials intensiveness of the zero-cycle apparatus considerably.

It has already become a part of the system when building large complexes to introduce a rotating-duty building method with the organization of residential towns for workers with all the necessary conditions for living and relaxing.

All this permits us to ensure uninterrupted work for labor collectives, to promote the introduction of a brigade contract and, as a rule, to see that projects are put into operation on time. The ministry considers the introduction of scientific and technological achievements first of all from the point of view of decreasing the input of materials and labor in construction.

Trenchless pipe laying ["beskanalnaya ukladka"] for heat networks has gone beyond the experiment stage. In the Kazspetsselmontazh, Tselinsantekhmontazh, Uralsksselstroy-8 and Kokchetavsselstroy-17 trusts production lines for mechanized application of vermiculite and Perlite based heat insulation on pipelines are in operation.

For every kilometer of trenchless network laying, there is a savings of 10 tons of steel and 60 tons of cement, and labor costs are reduced by 40 percent.

In improving this method, the Kazspetsselmontazh Trust was one of the first in the USSR Minselstroy system to introduce the technology of aluminizing pipes and a press for applying a continuous waterproofing cover with a liquid polyethylene base. Because of this we can nearly triple the operation life of the pipes.

The use of corrugated linear expansion joints made it possible to eliminate U-shaped expansion joints from the heating circuits, and consequently to save on pipes to install them. The introduction of trenchless laying is scheduled to double in 1990.

The use of plastic pipes in cold-water supply networks means a considerable savings; each ton of plastic pipes is the equivalent of 7 tons of metal ones.

Taking into account the difficulties with delivery of plastic pipe fittings, the Kazspetsselmontazh Trust has organized their production utilizing polyethylene granules with application by form presses.

Everyone knows of the efficiency of using plaster in construction. This is a universal material with many purposes. It is used to do finishing work on the interiors of social, cultural, and domestic services facilities with a general area of 20,000 square meters.

In 1983 a massive utilization of improved quality plasterboard sheets was begun in the installation of partitions and the finishing work of buildings.

In the Vostokkazselstroy-24 Trust frame production of one-room size gypsum concrete partitions has been organized with a capacity of 25,000 square meters per year.

Of course, the volume of plaster use is far below the demands of the builders. Therefore the scheduled creation of capacities to produce it in the 12th 5-Year Plan will permit a considerable increase in its volume as well as in the range of its use.

The use of industrial wastes, especially slag-phosphoric wastes, is a direction that shows promise. Already for a number of years, creative cooperation with the NIIstromproyekt Institute has enabled us to establish a normative technical base for using eletrothermalphosphoric slag to obtain a non-cement binding material. The essence of the technology lies in the material's being ground in ball mills and the activization of salts like carnallite, bischofite and others. In this way one may attain a binding mark of 600 and higher. At the Chimkentselstroy-25 Trust facility an experimental apparatus for producing 2,000 tons of binding material in a year has been constructed. Here the verification and introduction of the results of scientific-research work is carried out.

In the construction of low-rise residential buildings shallow foundations have begun to be used according to the developments of the TsNIIEPselstroy Institute; in comparison with the typical foundations, these enable us to cut costs in half, to lower the use of concrete to a third and labor costs to 30 percent. They are recommended for introduction throughout the whole system and especially for ground prone to swelling.

In cooperation with the YuzhgiproNIselstroy Institute of the Atbasar Reinforced Concrete Structures Plant, the technology for manufacturing unit elements for elevator buildings by the method of injecting the concrete mixture into molds is being completed. If the time for molding products by the traditional method amounted to 15 minutes, now we have to spend only two minutes.

The task of the engineering service of the ministry lies in seeing that the advanced experience we have developed or borrowed is not locally restricted but that it is widely distributed among organizations and enterprises of the building industry.

The Kazakh CP Central Committee and the Council of Ministers of KaSSR have determined a set of measures for introducing the achievements of scientific and technical progress into construction and for increasing the production of efficient building materials, structures and products in the period before 1990.

Collectives of construction organizations and industrial enterprises, the collegium, and the ministry's party and social organizations will do everything possible to accomplish the tasks that have been set.

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CONSTRUCTION PLANNING AND ECONOMICS

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RESPONSIBILITY FOR FINISHED CONSTRUCTION PROJECTS

Moscow PROMYSHLENNOYE STROITELSTVO in Russian No 2, Feb 85 pp 26-28

[Article by Ye.V. Strukachev, Member of the Board and Chief of the Industrial Planning Administration of the Belorussian SSR Ministry of Industrial Construction, I.A. Zheznitskiy, Candidate of Technical Sciences, Departmental Manager of the Promstroysistema Industrial Engineering Department, and N.P. Tikhonovets, Director, Minsk Computer Center: "Responsibility for Finished Construction"]

[Text] Since until now no specific standards have been written for construction management process systems, which are set up for each construction project to include the organizations involved (the customer, the prime contractor and subcontractors, head project planner, lower-level planners, personnel recruiters, scientific and technical organizations and others)¹, relationships among the parties involved in construction are determined by directives contained in a number of documents, the most basic of which is the Fundamentals of Civil Legislation of the USSR and the Union Republics as ratified by the USSR Supreme Soviet on December 8, 1961, which lays down the duties of parties involved in construction, i.e., the customer and the contractors. These duties are also set forth in a later edition of directives on drafting construction projects and estimates, Construction Standard (SN) 202. This directive not only contains regulations stipulating the contents, planning stages, coordination and approval of projects and estimates for the construction of new enterprises and the expansion, modernization and retooling of existing enterprises, buildings and facilities for various industrial and service sectors, but also facilitates the establishment of new relationships between the customer and the prime contractor.

New Construction Standards (SN 202-81*) provide that the customer (the party having the construction done) is responsible for the finishing and on-time delivery in operating condition, of facilities being placed in service, comprehensive equipment testing, initial adjustment of technological process lines, starting up production facilities and projects, the manufacture or production of products and the attainment of design capacity within the time frame planned. Construction and assembly organizations are responsible for perform-

¹I.A. Zheznitskiy, "Organizational Charts for the Management of a Socialist Construction Industry," [Organizatsionnyye struktury upravleniya sotsialisticheskimi stroitel'nymi proizvodstvom], Promyshlennoye stroitel'stvo, 1981, No. 8.

ing construction and assembly services of proper quality in accordance with project plans, within the time frames stipulated (Paragraph 1.21).

Making the customer responsible in the standards for placing facilities in operation becomes more understandable in the light of the history of SN 202, which was revised and approved by the USSR State Committee for Construction four times: in 1969 and 1976 and twice in 1981.

The current directive on drafting estimates and industrial construction projects (SN 202-69) provides under Paragraph 1.25 that the project customer is responsible for the timely submission of correct preliminary planning data to construction organizations, while the latter are responsible for quality and the performance of services by the deadline. In addition, Paragraph 8.1 requires that the construction and assembly contractors coordinate and approve construction estimates for buildings and structures. Of course, coordination and approval requires verification of estimate and project documents, so upon approval of estimates by the contractors, the approved construction cost of facilities described in the working technical documents becomes the final cost.

Under Paragraph 8.6, this principle is applied to the overall estimate: "The estimated cost of construction and assembly services figured from project estimates, including estimates and calculations for various services and expenses, becomes the final cost paid to the contractor by the customer for the performance of services, not subject to revision as blueprints are drawn."

Thus, of the triangle consisting of the customer, project planner and contractor, the greatest responsibility fell on the contractor. The contractor had to verify the planning estimates, which was particularly difficult to do in two-stage planning when the amount of design materials for an engineering project was greatly reduced. The contractor was responsible for the final construction cost as given in the overall estimate to which he agreed prior to approval of the project. But it then turned out that the contractor was not in a position to verify estimates for an engineering project. Poor estimates of the cost of this phase of construction spawned countless conflicts.

SN 202-76 on Drafting Plans and Estimates for Industrial Construction was approved in 1976. Paragraph 1.22 of this directive greatly expanded the customer's obligations. Responsibility for seeing that the technical and economic planning parameters for a structure or an enterprise are no poorer than those given in approved technical and economic feasibility studies for the planning, construction of the enterprise, structure or other facility to be planned. Paragraph 1.3 stipulates that the estimated construction cost given in estimate and planning documents must not exceed the cost of construction given in the feasibility study.

The prime contractor's responsibilities included submission of an overall estimate for engineering design and approval of the construction organization plan and estimates for the construction of individual facilities and the performance of the various services in order to calculate the customer's payments to the contractor for services rendered. Upon approval of these estimates by the contracting organizations, the cost of construction of facilities and services was considered final.

Thus, upon approval of the plan, responsibility for the estimated cost of the construction of the structure or enterprise was transferred from the prime contractor to the customer and the planning organization. The technical and economic feasibility study represented the design phase, i.e., the production of estimate and design documentation, but the basis for arriving at the cost of the enterprise was less accurate than the procedure instituted under SN 202-69. Practice has shown that these goals were unfeasible, as was the contractor's responsibility for the cost of the structure or enterprise as figured from the engineering plan under SN 202-69.

The third revision of SN 202 was approved on September 1, 1981 (SN 202-81). In addition to responsibility for on-time readiness for operation and initiation of production at facilities being placed in service, the customer is made responsible for placing industrial facilities in service. SN 202-81 stipulates that the estimated cost of construction of enterprises, buildings and structures as given in estimate and planning documentation must be the same as or less than the calculated cost forecast in approved five-year plan lists of new construction and modernization and expansion projects, while other technical and economic parameters must equal or improve those given in these lists. The approved cost estimate is the ceiling for the entire construction term. These provisions were retained in SN 202-81* as approved in December of this year.

As can be seen from this, the trend in construction standards is to place greater responsibility on the customer, i.e., on the non-construction sector of the economy. Whereas in the past, the contractor was responsible for the cost it had approved for a structure or enterprise, today the contractor is responsible only for holding the estimated cost of individual facilities or services to the estimates it approved in working plans. Under SN 202-69, the customer was responsible only for the submission of correct input data to planning organizations, but under SN 202-81* the customer is also responsible for placing units and facilities in service. Under SN 202-69, the final cost of structures and enterprises was determined by the total of the estimates, and under SN 202-76 by the approved technical and economic feasibility study, but under SN 202-81* by five-year plan lists of enterprises, i.e., by documents which bear no connection to construction organizations.

The customer must calculate the estimated cost and technical and economic parameters of enterprises, buildings and structures and incorporate them into five-year plan documents. Together with the planning organization, the customer is responsible for maintaining the approved parameters over the entire planning and construction term and in the final analysis is also responsible for placing units and facilities in service. To put these relationships in everyday terms, it is like ordering a suit (an enterprise) from a tailor (contractor). The customer himself determines the cost of the suit (calculated cost of the enterprise). The tailor (contractor) fills the order, using his own materials and labor. But the customer is responsible for delivering the suit (placement in service). It must be said that logic is reversed here.

After 12 years (1969-1981) of searching for a solution, an illogical concept of an organizational structure for managing the construction industry was imposed which made the customer responsible for the final facility built. Somewhere along the way, such important matters as the commercial construction industry, which should have been of paramount importance in every planning organization,

setting the tone for all projects from the initial phase forward, got lost. In SN 202-81*, the commercial construction system is a haphazard result of the development of a project and is not planned as such at all. In SN 202-81*, there is not a word about the need to develop the data on materials, parts and designs in planning documentation required to order them from USSR State Committee for Material and Technical Supply organizations; in other words, ordering specifications for designs, parts and materials required under Resolution 695, "The Improvement of Planning and Strengthening of the Economic Factor to Raise Production Efficiency and Work Quality," adopted July 12, 1979, by the CPSU Central Committee and the USSR Council of Ministers. This resolution sets forth measures to ensure the continuity of capital construction plans and make both customers and contractors more responsible for placing industrial units and facilities in service on time. Although SN 202-81* makes the customer solely responsible for placing industrial units and facilities in service, it is up to construction ministries and their departments as well as construction and assembly organizations to plan both the placement in service of units and facilities and the volume of the commercial construction industry. On the whole, this is how builders received plans for the current five-year plan, and it is doubtful that this planning method will change in the future. As is well-known, the contractor has administrative responsibility for meeting the plan for placing facilities in service.

Placing facilities in service amounts to meeting a commercial construction plan; thus, the contractor has an economic interest in delivering facilities on time or ahead of schedule. The extent of the contractor's responsibility derives from this, and economic incentives and material interest reinforce it. This situation is especially graphically illustrated in the case of facilities which, in accordance with this resolution, must be delivered to the customer under a turnkey contract. In this case, the prime contractor is solely responsible for placing industrial units and facilities in service. This conflicts with two standards: SN 202-81* and Regulations on the Turnkey Construction of Enterprises (Structures), approved by the USSR State Committee for Construction on October 13, 1980.

The requirements set forth in Directive SN 202-81* concerning the customer's responsibility for placing industrial units and facilities in service contradict Article 67 of the Capital Construction Contract Agreement (Fundamentals of Civil Legislation of the USSR and its Union Republics), which requires the contractor to use its own means and resources to build and deliver the planned facility to the customer organization on time, meeting estimate and planning documentation. These conditions are discussed in a collection of articles entitled, "Capital Construction Legislation,"² as follows: "In spite of the fact that prior legislation provided that construction contractors were responsible for performing a given amount of construction and assembly services, Article 67 of the Fundamentals gave a radically new definition of the object of the capital construction contract agreement.... The object of the contract agreement is now the finished construction project as described in the plan, ready for delivery, i.e., the finished product of a construction organization. Finished industrial-type facilities, as required under subsequent legal standards, must be totally finished and ready for comprehensive equipment testing

²"Legal Literature" [Yuridicheskaya literatura], Moscow, 1977, 1st edition.

and initiation of production." From this, it follows that the lessened responsibility required of the contractor prior to the initiation of construction and assembly work, as provided under SN 202-81*, violates existing legislation, contradicts modern practice and goes against Resolution 695 by the CPSU Central Committee and the USSR Council of Ministers.

It should be stressed that the definitions of "customer" and "contractor" in SN 202-81* describe the ideal case. In reality, they are seldom found. The interrelationships then between a customer and contractor of different sectors or within the same sector are different. The role of higher organs influencing the customer and the contractor in spite of their formal rights and duties must not be underestimated.

A customer ministry may be individually responsible for placing units and facilities in service if the operating, planning and construction organizations are in the same ministry, as is the case in the USSR Ministry of Energy, the USSR Ministry of Ferrous Metals and others (which is allowed under Resolution 695 of the CPSU Central Committee and the USSR Council of Ministers.) The customer's functions are centralized within the ministry. A prime contractor may also be individually responsible for placing units and facilities in service when undertaking the capital construction of its own industrial base or setting up construction, design and other associations encompassing construction, design, assembly and other organizations, as well as turnkey projects. There are administrative construction organizational situations in which the customer is responsible for the preparation of estimate and planning documentation and submission of this documentation to the contractor and the contractor is responsible for the delivery of the project to the customer on a turnkey basis. There are also flexible construction organizational situations in which the customer is responsible for the preparation of estimate and planning documentation and the contractor is responsible for building and assembling the technical equipment, but the customer is responsible for adjusting the technological process and placing units in service. In some cases, the customer assembles the technological equipment. Socialist industrial construction industry practices are so varied that there is no way they could be described as a single type. Organizational differences in administration assure managerial flexibility and accomplishment of goals with the greatest possible savings. These differences should be recognized in standards and legislation and taken into consideration in construction planning.

Out of all these complex socialist construction practices existing today in the administrative organization of the construction industry, one has been chosen, SN 202-81*, where the customer is solely responsible for the finished product in all cases. A number of specialists lean toward the opinion that the customer should also plan commercial construction. Such dual planning for finished goods does not fit into the framework of management theory or economics.

In a resolution on "The Improvement of Capital Construction Planning, Organization and Management" by the CPSU Central Committee and the USSR Council of Ministers, it is noted that in recent years an incorrect situation was allowed under which many construction and assembly trusts and general contractors reduced their responsibility for placing enterprises, buildings and structures in service on time and performed construction coordination functions unsatisfactorily. This did in fact take place, but is not surprising when different

standards, having the effect of construction law, take different approaches to the evaluation of work performed by construction organizations and set these organizations different tasks and goals. The revisions which SN 202 has undergone best illustrate the situation that has arisen and the negative trend pointed out in the resolution.

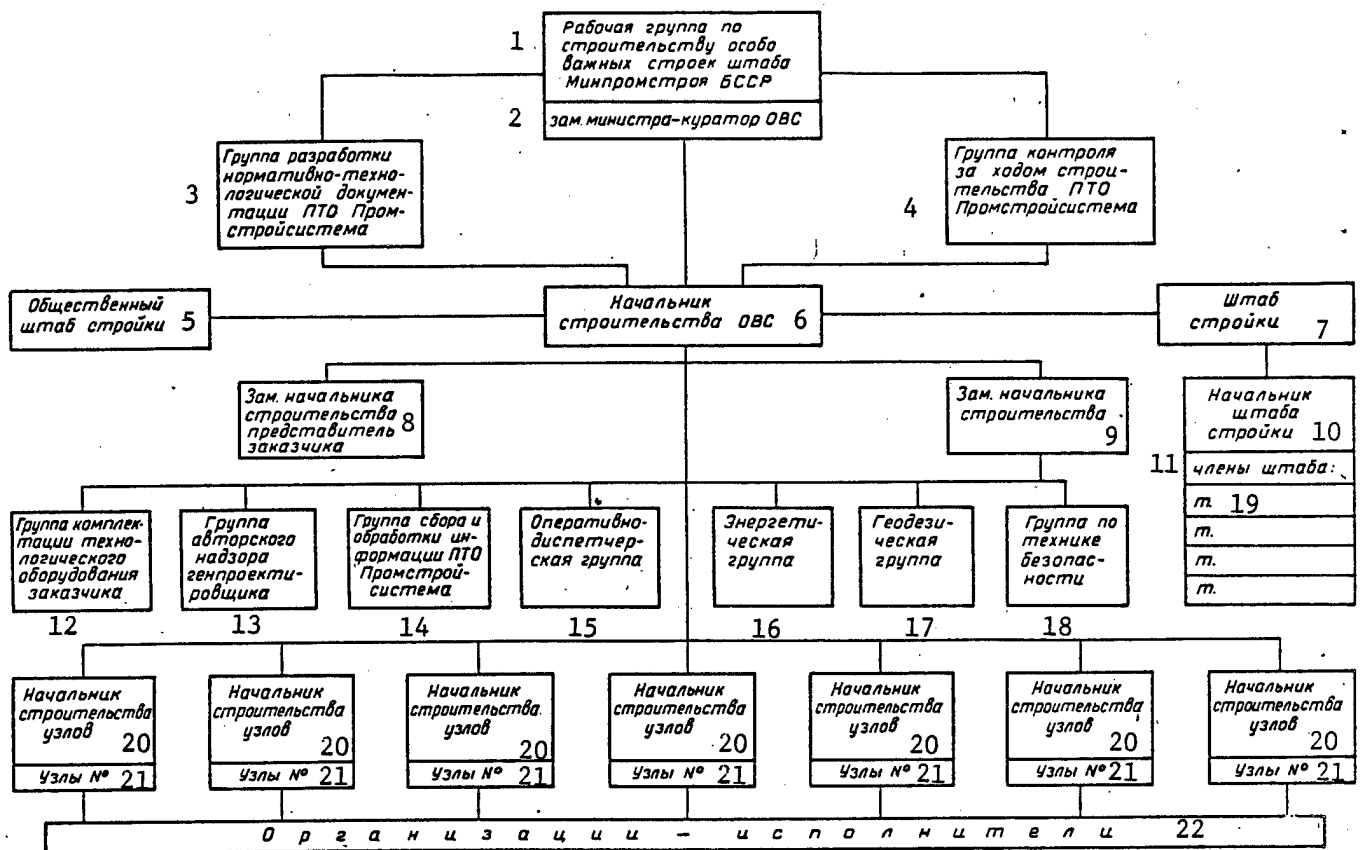
The problem is not that everything has been written down in a document: not even the very best document can resolve all administrative problems if the relevant organizational and economic prerequisites have not been provided. The problem lies in the weakness of the organizational structure of management in the construction industry and the decentralization of construction administration. Therefore, it must be stressed that in the above mentioned resolution by the CPSU Central Committee and the USSR Council of Ministers, the trust or general contractor is required to coordinate the activities of all parties involved in construction, and the contractor's decisions related to the implementation of approved plans and work schedules are binding on all parties involved, regardless of hierarchical organization.

Expansion of the rights of trusts and their extension to all construction organizations, regardless of hierarchical organization, gives the trusts powerful economic leverage over these organizations and will facilitate administrative centralization at construction sites.

Experience at the BSSR Ministry of Industrial Construction attests to the fact that these issues can no longer be put off. In addition to the regular method³, the Ministry also uses temporary directives to manage the construction of high-priority projects, which spell out measures formulated at the level of planning, preparation, organization and construction administration. A typical organizational chart for the management of a high-priority construction site is given in the illustration.

The directives stress that the administrative organization of high-priority construction projects is the duty of the construction organization's manager. Construction management must be implemented by the regular method and a remote-control system must be in effect at the construction site. High-priority construction projects are headed by a construction manager appointed in a ministerial order concerning services rendered by a general contracting construction organization. It requires that the construction manager draft and approve an organizational chart for the construction project and regulations governing the administrative system. An administrative team headed by an administrative chief is formed at the site, in addition to the following working groups: a technological equipment group consisting of specialists provided by the customer, who temporarily report to the construction manager; an inspection team consisting of specialists provided by the prime contractor and subcontractors, headed by the head project engineer; a data acquisition and processing group consisting of specialists provided by the Promstroysistema Industrial Engineering Department and its subsidiaries, oblast data-processing centers; an operations dispatcher group consisting of specialists provided by the prime contractor; and a power, geodesic and safety group consisting of personnel provided by the prime contractor and subcontractors.

³"Industrial Construction" [Promyshlennoye stroitel'stvo], 1984, No. 3.



Organizational Chart for a High-Priority Construction Project

- | | |
|--|---|
| 1. High-Priority Construction Project Working Group at BSSR Ministry of Industrial Construction | 2. Deputy Minister/Special High-Priority Construction Project Overseer |
| 3. Technical Documentation Development Group at Promstroysistema Industrial Engineering Department | 4. Work Pace Monitoring Group at Promstroysistema Industrial Engineering Department |
| 5. General Head Construction Office | 6. High-Priority Construction Project Supervisor |
| 7. Construction Office | 9. Assistant Construction Supervisor |
| 8. Assistant Construction Supervisor/Customer Representative | 11. Office Personnel |
| 10. Construction Office Manager | 13. General Planner's Inspector |
| 12. Customer's Equipment Group | 15. Operations Dispatcher Group at Promstroysistema Industrial Engineering Dept. |
| 14. Data Acquisition and Processing | 19. Mr. |
| 16. Power Group | 21. Assembly No. |
| 17. Geodesic Group | |
| 18. Safety Group | |
| 20. Assembly Construction Supervisor | |
| 22. Construction Organizations | |

The equipment and inspection groups report to the assistant construction manager and the customer's representative (the enterprise's director and his construction assistant). Specialists are assigned to work in construction administration in an order drafted by the organizations involved which specifies the nature and administrative hierarchy of their job.

Directives describe the scope of organizational and technical documentation and set forth general guidelines for construction administration. The guidelines indicate documentation flow, job descriptions, labor guidelines for lower levels and other organizational details.

Control over the progress of construction at high-priority projects is exercised by a working group at ministry headquarters and personally by the deputy minister, who is the special construction overseer. Organizational and technical documentation and construction progress inspection groups assist the deputy minister.

The ministry has sent a draft of a temporary directive to the USSR State Committee for Construction on the administrative organization of high-priority construction projects with a request to approve it in the form of individual construction standards. These standards retain the basic regulations of current ministerial directives, but they also include certain additions required by the nationwide scope of the directive.

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CSO: 1821/007

CONSTRUCTION PLANNING AND ECONOMICS

CAPITAL CONSTRUCTION UP, HOUSING DOWN IN LITHUANIA

Vilnius SOVETSKAYA LITVA in Russian 30 Jul 85 p 1

[Commentary by LiSSR Gosplan: "Construction Rates Up"]

[Text] Rather good indicators on the whole were reached in capital construction in the first half of this year. Planning quotas were fulfilled for turning over for operation the fixed capital, the majority of production capacities, housing and other projects. The limits on state capital investments and construction and installation work for individual sectors of the national economy were also fully used as a whole. The Ministry of Construction, Ministry of Rural Construction and the Republic Association of Interkolkhoz Construction Organizations are successfully fulfilling plans for contract work.

Capital investment plans were being fulfilled in the cities of Shyaulyay, Panevezhis, Alitus and Druskininkay as well as in Varenskiy, Yonavskiy, Shakyayskiy and Trakayskiy rayons.

With the overall positive results in fulfilling capital construction plans, however, there was also a failure to avoid rather large shortcomings which can have a negative effect on implementation of the annual as well as the five-year plan. For example, limits of capital investments and construction and installation work are being used inefficiently this year by the LiSSR State Committee for the Supply of Production Equipment for Agriculture (Goskomselkhoztekhnika), the LiSSR State Committee for Cinematography, LiSSR State Committee for Publishing Houses, Printing Plants, and the Book Trade, LiSSR State Committee for Vocational and Technical Education, LiSSR State Committee for Gas Supply, Ministry of Municipal Services, Ministry of Procurement, LiSSR State Committee for the Supply of Petroleum Products (Goskomnefteprodukt), the Ministry of the Construction Materials Industry and other departments.

Progress on construction of some projects of the agro-industrial complex also causes concern. Contracting organizations of the Ministry of Construction unsatisfactorily assimilated volumes of construction and installation work in the first half-year in the construction of the Plunge and Simnas vocational-technical schools, the Gondingskiy Interfarm Poultry Factory of Plungeskiy Rayon, the Pavenchayskiy Sugar Combine and a number of other projects; and the same goes for subcontracting organizations of the Ministry of Rural Construction in construction of the Anikshchayay Vocational-Technical School, a milk

Progress of Capital Construction in Cities Under Republic Jurisdiction
and in Rayons for First Half of 1985 (accomplishment shown in percentage)

City, rayon	Total volume of construction-installation work at production and nonproduction projects. from all financing sources						Placed in operation (from annual plan)				
	Ministry of Construction organizations		Min of Rural Construction organizations		Interkolkhoz construction organizations		Using own resources (annual plan)	Total useful area in residences	In rural area		
	Annual volume	Volume estab- lished for half-year	Annual volume	Volume estab- lished for half-year	Annual volume	Volume estab- lished for half-year			Individual residences	Children's preschool establishments	Dining halls
A	1	2	3	4	5	6	7	8	9	10	11
Cities under republic jurisdiction											
Vilnius.....	49	99.0	—	—	—	—	—	43	—	—	—
Kaunas.....	47	99.0	—	—	—	—	—	46	—	—	—
Klaypeda.....	43	97	—	—	—	—	—	39	—	—	—
Shyauliyay.....	50	105	—	—	—	—	—	44	—	—	—
Panevezhis.....	47	103	—	—	—	—	—	44	—	—	—
Alitus.....	50	110	—	—	—	—	—	40	—	—	—
Kapsukas.....	44	95	—	—	—	—	—	48	—	—	—
Druskininkay...	51	105	—	—	—	—	—	28	—	—	—
Palanga.....	47	100.3	—	—	—	—	—	24	—	—	—
Rayons											
Akmyanskiy.....	24	55	58	103	49	100.9	18	65	19	x	x
Alitusskiy.....	49	94	90	5.7*	42	105	26	34	11	x	x
Anikshchvayskiy	42	82	43	81	42	95	19	22	10	20	x
Birzhayskiy.....	16	58	51	106	47	103	18	39	28	36	x
Varenskiy.....	28	108	53	103	51	104	23	23	16	x	x
Vilkavishkskiy..	48	100.4	52	106	49	100.9	36	31	22	34	x
Vilnyusskiy....	51	157	50	101	47	99.4	23	14	23	x	80
Zarasayskiy.....	x	x	35	79	50	102	38	30	7	58	x
Ignalinskiy.....	54	98	51	104	52	104	125	32	27	100.0	x
Jonavskiy.....	54	115	55	101	47	104	72	56	17	100.0	x
Jonishskiy.....	63	109	51	96	49	107	36	24	19	x	x
Kapsukskiy.....	31	116	50	98	48	101	3.4*	10	32	18	x
Kaunasskiy.....	51	103	44	95	57	108	29	34	38	x	x
Kayshyadorskiy..	42	93	40	83	50	103	23	17	28	—	50
Kedaynskiy.....	45	97	46	100.2	43	105	77	49	18	x	x
Kelmeskiy.....	80	111	34	74	52	102	39	12	22	38	—
Klaypedskiy.....	45	110	20	123	49	113	19	10	4	40	x
Kretingskiy.....	43	99.5	59	107	52	97	15	58	32	x	x
Kupishskiy.....	83	111	32	77	41	98	31	38	16	x	x
Lazdiyskiy.....	x	x	47	92	50	107	14	32	33	x	x
Mazheykskiy.....	52	104	45	83	47	100.9	52	60	14	36	x
Moletskiy.....	—	—	47	95	51	104	22	47	7	40	40
Pakryoykiy.....	x	x	45	107	44	99.7	48	42	7	25	x
Papevezhskiy....	67	97	48	90	49	102	85	53	8	76	x
Pasvaiskiy.....	77	2.6*	54	104	51	105	38	43	5	x	x
Plungeskiy.....	46	92	59	108	48	99.1	48	49	21	17	x
Prenayskiy.....	122	122	48	100.9	46	99.6	34	55	16	50	x
Radvilishkskiy..	44	107	41	90	49	103	51	18	13	x	x
Raseynskiy.....	x	x	49	100.2	50	103	63	32	20	x	—
Rokishskiy.....	47	101	51	108	51	105	28	56	13	x	x
Skuodasskiy.....	11	196	56	108	48	99.0	23	25	14	14	x
Iavragaskiy.....	45	108	—	—	45	102	31	36	23	50	x
Ielshvayskiy.....	58	98	52	104	54	112	20	55	26	21	100.0
Irakayskiy.....	46	117	44	102	49	108	22	34	12	x	x
Ukmergskiy.....	38	88	45	102	51	99.0	68	45	25	25	x
Utenskiy.....	50	100.6	57	102	46	93	28	53	28	100.0	x
Shakyayskiy.....	27	104	47	102	51	101	30	24	21	60	x
Shalchininkskiy..	45	89	52	104	52	108	13	45	7	55	x
Shvenchenskiy...	50	82	47	103	47	99.7	38	61	9	67	x
Shilalskiy.....	20	125	48	98	52	104	23	49	11	25	x
Shilutskiy.....	56	116	51	98	43	100.2	53	41	36	x	x
Shirvintskiy....	162	162	50	97	49	101	37	51	20	x	x
Shyauliyayskiy...	33	82	60	116	49	102	60	12	36	7	x
Yurbarkskiy.....	33	85	42	101	49	102	21	20	21	10	66

x - not planned for accounting period
* - times

production complex in the Paezheryay Sovkhoz of Shyaulyayskiy Rayon, the Dusetskiy Stud Farm in Zarasayskiy Rayon, a sovkhoz-tekhnikum in Vilnyuskiy Rayon and other projects. A lag has been permitted in fulfilling construction plans for some projects of the agro-industrial complex by interkolkhoz construction organizations.

The construction of individual and cooperative housing in the village is considerably worse than in 1984. Only 19.6 percent of the buildings planned for construction were turned over for operation in the first half-year. Ten percent less individual and cooperative rural housing than provided by the annual quota was turned over for operation in Klaypedski, Moletski, Pakruoyski, Panevezhski, Pasvalski, Shalchininski and Zarasayski rayons. Construction of the Vilnius and Pabrade purification facilities, renovation and expansion of rayon boiler houses in Vilnius, Alitus, Kapsukas and Rokiskis, and construction of water supply and sewer lines in Klaypeda, Telshyay and Trakay is proceeding behind schedule. There is also a similar situation in the construction of a number of other municipal projects which are especially important for supplying the population with water, heat and other municipal services. The situation is aggravated by the fact that there are many deficiencies in the work of clients as well, such as in matters of providing construction sites with equipment and the necessary supplies.

Also causing concern is the fact that there was unsatisfactory construction performed on public education projects in Pasvalis and Anikshchyay (kindergarten-nurseries have not yet been turned over for operation there); also unsatisfactory was the construction of cultural projects in Vilnius and Kaunas and in Shyaulyayskiy Rayon, and of public health projects in Vilnius and Kaunas and Kedaynski, Moletski and Radvilishki rayons.

Ministries, departments, ispolkoms of city and rayon soviets, clients and contractors must take urgent steps to remedy all deficiencies in capital construction and to increase the demands on heads of enterprises, organizations, construction sites and construction organizations. The planning quotas for capital construction established for 1985 must be strictly fulfilled.

6904

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CONSTRUCTION PLANNING AND ECONOMICS

COUNCIL OF MINISTERS APPROVES RENEWAL PLAN FOR SIX CITIES

Moscow TRUD in Russian 6 Oct 85 p 2

[Interview with V. Vysotskiy, director of "Giprogor" Institute, conducted by TRUD correspondent S. Snegirev: "Twenty Years Later"]

[Text] The projects developed by the specialists at the capital's "Giprogor" Institute allow us to take an unusual excursion into the future of our cities and to see what they will be like at the beginning of the 21st Century. The RSFSR Council of Ministers ratified the general plans for the development of Volgograd, Vladimir, Volgogradsk, Novorossiysk, Orenburg and Orsk which have been developed here and extending to the year 2005. "Giprogor" Institute Director V. Vysotskiy tells TRUD correspondent S. Snegirev about how their appearance will change in 20 years.

[Question] Viktor Sergeyevich, plans have been ratified for the development of six cities. Each of them has its own history, its own face, and its own peculiarities. We must assume that the tasks facing them in the next 20 years are also different. What are the general requirements which you set for cities in the year 2005?

[Answer] It is not we who set these requirements, but life itself. In short they may be formulated as follows: each city, with all its individuality, must be economical, healthy and comfortable. That is, it is necessary to rationally utilize every hectare of territory within it, to implement effective measures for protection of the urban environment, and finally to create the maximum convenience for the residence. These are the three main conditions which the city of the future must meet. Today, for example, in many modern cities, almost half of all the territory is taken up by industrial zones, and these are utilized on the average by only 30 percent. I am referring to building density. But even in the residential areas, the territory is not everywhere utilized rationally. Nevertheless, such cities continue to grow territorially, and new land is allocated to them. Can we call them economical? The problems associated with improving the healthfulness of the urban environment and creating favorable conditions for the residents are also acute. The general plans for development are called upon to solve these problems.

[Question] You mentioned the industrial zones, and here is what I thought. The residential areas in many cities are currently being built in the suburbs, far from the industrial enterprises. On one hand this is good--clean air, quiet, excellent conditions for recreation. But on the other hand, the transport problem often arises. It is necessary to make bus changeovers in the course of going to work and back, and the trip takes much time...

[Answer] Particular attention has been given to this question. The general plans have developed such systems of transport main lines which would allow the city dwellers to spend a minimum of time not only on trips to work and home, but also to any part of the city. New roads directly connect the residential areas with the industrial zones, cultural centers, and places of recreation. Some streets will be reserved only for the movement of passenger transport. Traffic circles and detour routes will reduce the intensity of city traffic, as will special main highways for trucks which will bypass the residential areas and central streets. As an example, we may cite the general plan for the development of Orsk. Its main idea consists specifically of overcoming the dispersity in residential areas which has been historically formed and which, naturally, hinders the everyday travel of the citizens. The general plan provides for the reconstruction of the system of main transport highways and the construction of a new bridge over the Ural River.

Another example is Volgograd. Here, considering the considerable extent of the city, a network of high-speed highways will be built.

[Question] The solution of the transport problem is, of course, directly associated with increasing the comfort of the city. What else will be done in this direction?

[Answer] The general plans provide for all the necessary facilities of social-cultural-domestic function to be located, as we say, in the zone of pedestrian access. Any city resident must be able to reach a store, consumer service enterprise, public dining facility, school, sports field, polyclinic, etc. from his home within a matter of minutes. In Orsk, Volgograd and other cities, multi-purpose centers providing services to the population will be created in every residential area.

Here is another important detail. A network of pedestrian streets is being planned in every city--similar to the old Moscow Arbat. In Vladimir, for example, the entire historical center of the city will become such a pedestrian zone.

The general plans provide for the preservation of all historical centers and points of interest in the cities. Moreover, many of them will be reconstructed and will take on their former appearance. The nearby streets and squares will also be appropriately refurbished. Finally, the new microrayons will also take on their own appearance. Model projects will be developed not for the country as a whole, but by region. There will be a possibility of individual formulation of residential areas and individual buildings.

Let us look, for example, into the future of Novorossiysk. The entire city will rise before us as an amphitheatre descending from the slopes of the Abrauss mountain range. The main compositional axis will be the esplanade-boulevard running along the sea with its multitude of squares. A number of green boulevards will rise along the slopes of the mountain range. The main one will go up to the highest mark, from which a panorama of all Novorossiysk will be visible. The memorial complexes of the Civil and the Great Patriotic Wars will become part of the all-city center. A new memorial zone--the Boulevard of Heroes--will be created along the "225 days" line of defense.

You will not confuse the appearance of Volgograd, which will open up before you in the beginning of the next century from the river side, with any other city. The small enterprises, warehouses, and old buildings will disappear from the shore line. In their place will be improved sea-fronts and attractive residential apartments. Orenburg will be all adorned in greenery in the year 2005. Its "calling card" will become the reconstructed historical center. In a word, every city will have its own face.

[Question] One last question: why has the selection fallen specifically on these six cities?

[Answer] There is no selection here. The general plans for the development of cities are created for every 20 years, so it was simply time for their renewal. Currently the institute is developing around 15 new general plans. Soon the future of other cities will also be defined.

12322

CSO: 1821/56

CONSTRUCTION PLANNING

CONSTRUCTION MINISTERS URGE INCREASED MECHANIZATION

Moscow STROITELNAYA GAZETA in Russian 13 Oct 85 p 2.

[Article: "In the USSR Gosstroy"]

[Text] At its regular meeting, the USSR Gosstroy [State Committee on Construction Affairs] governing board examined an outline of the plan for comprehensive mechanization and automation of construction and installation work for the year 1986.

It was noted that individual construction ministries and departments did not fulfill their tasks on comprehensive mechanization and automation of construction and installation work in the first 6-month period of the current year as established by the USSR Gosstroy. Also, the application of building machines had declined as compared with the corresponding period in 1984.

In January-June of the current year as compared with the first 6-month period of 1984, there was an increase in the application of manual labor for earthwork in the USSR Ministry of the Coal Industry, the Ministry of Construction in the Far East and Transbaykal Regions, and the building organizations of Mosgorispolkom [Moscow City Executive Committee]; for cargo-handling operations-- in the USSR Ministry of Power and Electrification and the Ministry of Transport Construction. The volumes of concrete work performed by hand increased in the USSR Ministry of Land Reclamation and Water Resources and the USSR Ministry of Construction. The output of basic construction machines declined somewhat in the USSR Ministry of Power and Electrification, the USSR Ministry of the Coal Industry, the USSR Ministry of Land Reclamation and Water Resources, the Ministry of Transport Construction, and the Ministry of Construction of Petroleum and Gas Industry Enterprises.

Many construction organizations are making unsatisfactory use of hydraulic hammers, equipment for the installation of bore-driven piles and "wall in the ground" structures, high pressure painting units, perforators for hole punching, and other new technology.

Often new construction machines of increased unit capacity do not work at full force.

The construction ministries and departments are slow in developing the activity of mechanization trusts and administrations. They are not giving enough attention to the development of instrumental management, to improving quality and reducing the repair time of technology, or to the solution of questions on the automation of production processes at building industry enterprises and construction sites.

These shortcomings lead to a reduction in the growth rate of labor productivity in construction.

The construction ministries and departments have been told to take measures for correcting the deficiencies which have been allowed.

The USSR Gosstroy governing board generally approved the plan for comprehensive mechanization and automation of construction and installation work for 1986. This plan provides for intensive tasks on improving the application of building machines and transport means, and reducing the volume of work performed by hand. Provision has been made for increasing the level of comprehensive mechanization for preparing, transporting and placing monolith concrete, and performance of earthwork, roofing, plastering, painting and other labor consumptive operations.

The construction ministries and departments have been assigned the task of developing and implementing measures for significantly increasing the effectiveness of utilizing the construction machine pool, improving its structure and qualitative make-up, replacing outdated technology, ensuring the widespread introduction of new effective machines for the mechanization of finishing and cargo handling operations at the building sites, improving the application of motor transport, and reducing the expenditure of fuel and lubricant materials.

The question of further development of technical normalization and standardization in construction was also reviewed at the meeting.

Managers of USSR ministries and departments and directors of project planning and scientific-research institutes took part in the work of the governing board.

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INDUSTRIAL CONSTRUCTION

MANAGEMENT PROBLEMS WITH LARGE TURNKEY PROJECT RECALLED

Moscow KHOZYAYSTVO I PRAVO in Russian No 7, Jul 85 pp 63-66

[Article by V. Korostoshevskiy, chief of economic analysis laboratory of Tadzhikgidroenergostroy Trust, under the rubric "Practice and Experience": "Turnkey Hydroelectric Power Station"]

[Text] For the first time in hydraulic engineering practice, the first power unit of a station was placed in operation not 7-8 years after the beginning of construction as previously was the case on such projects, but after four years. This happened during construction of the Baypazinskaya GES [Hydroelectric Power Station] in the Tajik SSR. It is planned to place two more units in operation this year.

A few words about what kind of a station this is. It is being built on the Vakhsh River 35 km below the Nurekskaya Hydroelectric Power Station dam at an operating hydraulic development intended for irrigating lands in the Yavan Valley. Its capacity is 600,000 kw and the estimated cost of construction is over R200 million. With the start-up of the power units of this hydro-station the Tajik SSR will fulfill the target of the 26th CPSU Congress: "To take electrical energy production in the republic to 16 billion kilowatt-hours."

Just what was the basis for such success by the builders?

It is common knowledge that the CPSU Central Committee and USSR Council of Ministers adopted Decree No 695 "An Improvement in Planning and a Strengthening of the Effect of the Economic Mechanism on an Increase in Production Efficiency and Work Quality" on 12 July 1979. The decree in particular stated the advisability of a gradual shift to construction on credit granted by the USSR Stroybank [All-Union Bank for Financing Capital Investments] to construction and installation contracting organizations for the full cost of constructing an enterprise (or facility) as determined by an estimate made by the general contractor with the delivery of finished enterprises or facilities to the client as turnkey projects. Guided by Decree No 695, the USSR Stroybank issued the Statute on Turnkey Construction of Enterprises (Facilities).

After familiarizing itself with these normative documents, the collective of the Tadzhikgidroenergostroy Trust, which was part of the management of NurekGESstroy construction, decided to request the USSR Minenergo

[Ministry of Power and Electrification] to authorize it to build the Baypazinskaya Hydroelectric Power Station by the new method.

It would appear that the story of our experience will be useful for others inasmuch as late last year the union Gosplan, Gosstroy, Goskomtrud [State Committee for Labor and Social Problems], Minfin [Ministry of Finance] and Stroybank, in accordance with the CPSU Central Committee and USSR Council of Ministers Decree of 29 April 1984 "Improving the Planning, Organization and Management of Capital Construction," drew up and approved the Statute on the Implementation, as a Test, of Construction of a Number of Projects Under Plans and Estimates Coordinated Between Client and Contractor, with Their Turnkey Delivery, Expansion of Independence of Construction Organizations, and Increase in Responsibility of Construction Participants. This Statute reflected some of the problems which our trust's collective had to resolve immediately during construction of the Baypazinskaya GES.

This year, in accordance with the party and governmental decree of 29 April 1984, a test of turnkey projects will be conducted in construction organizations of three union ministries, in two of the Belorussian SSR, and in Glavzapstroy [Main Administration of Construction in Western Regions]. We would wish that the new participants of the experiment do not repeat those mistakes we made. There were many of those mistakes, and the first one...

But about this perhaps later. First a word about how we began.

Simultaneously with the request to authorize construction of the Baypazinskaya GES by the turnkey method, we also sent to the USSR Ministry of Power and Electrification addenda to the Statute on Turnkey Construction of Enterprises (Facilities) which was issued by the USSR Stroybank.

In these addenda we proposed in particular to transfer the client functions for the entire construction period to the contracting organization and, in the person of the Tadzhikgidroenergostroy Trust, to give the contracting organization the right to change the composition of temporary buildings and facilities to be constructed. The addenda also stipulated that the contractor would perform temporary operation of the GES units until its turnkey delivery, and they defined the procedure for payment for complexes placed in temporary operation, for settlements with subcontracting organizations and so on. Our addenda to the aforementioned Statute were accepted and, in accordance with the order of the USSR Minister of Power and Electrification, the collective of the Tadzhikgidroenergostroy Trust began turnkey construction of the Baypazinskaya GES on 1 January 1981.

Here is where we made the first mistake. I will tell about the system of legal relationships existing in capital construction in order for the substance of the mistake to become clearer. The amount of financing and the yearly set of projects and capacities to be placed in operation all is within the competence of the client, which in our region would be Tadzhikglavenergo, the future proprietor of the GES. This client was responsible for prompt issuance of planning documentation and equipment, training personnel for servicing the capacities to be placed in operation, and so on.

The requirements of normative documents obligating the client to coordinate his decisions with the general contracting organization often were not fulfilled or were fulfilled by the client formally if for some reason the requirements were contrary to the client's interests. Moreover, having powerful leverage, the client was not afraid of the contractor's application of penalty sanctions, which would be directed against its "employer" and "cashier." In this connection the contracting organization's rights secured by law are at times not realized in practice.

But even the client's breach of his obligations does not relieve the contractor of responsibility for deadlines for placing capacities and projects into operation or for nonfulfillment of the plan for commodity construction products. A number of the other participants in construction do not bear responsibility for project construction deadlines: the planning and scientific research institutes and the suppliers of materials. They have their own plans established by a higher department and their own sources of supply of physical resources and technical resources which are in no way tied in with the plans of the general construction organization.

Under these conditions, where are we to look for ways of resolving the bureaucratic contradictions?

And so various kinds of interdepartmental commissions and construction site staffs are established. Yes, they succeed in breaking down some barriers, but since their decisions are not mandatory for the organizations, establishments and enterprises on those matters which are beyond the competence of the representatives of such a commission or chief of staff, the decisions often remain unfulfilled.

The decisions for construction on bank credit to the full amount of the project's estimated cost and the shift to settlements for the phases and complexes turned over helped greatly to eliminate the bureaucratic disputes, but even they did not turn the general contractor from a "persuader in chief" into a "commander in chief": it is true that the general contractor's duties diminished a bit, but the rights did not increase!

These, then, were the circumstances which led to the decision of the Tadzhikgidroenergostroy Trust management to assume the functions of client for the entire construction period.

But just where, you will ask, is the promised story about the mistake? We now have arrived at it.

The first mistake was that instead of including addenda assigning the trust to perform the functions of client in the contract agreement with the future proprietor of the GES, we completely cancelled the contract agreement with it. We thus excluded the true client from participants in the construction, which led to many unjustified difficulties in relationships with it. In place of a contract agreement, an agreement was concluded defining the relationships of the trust and Tadzhikglavenergo only for the period of the station's temporary operation, i.e., it defined only the procedure for placing capacities in

operation and delivering electrical power to the system. This agreement did not consider questions of coordination in the very process of prompt introduction of capacities.

It was during the work of constructing the Baypazinskaya GES that we concluded that new forms of the contract agreement had to be drawn up for the turnkey construction, in accordance with which the client:

charges the contractor with performing his functions for the time of construction;

passes on, in the prescribed order and within the times set by the agreement, the wage force and fund and appropriations for salary of the administrative staff needed by the contractor for exercising client functions during construction as well as during start-up and adjustment work and temporary operation.

The contract agreement must stipulate reimbursement of the contractor's outlays for adjustment and preparation of equipment and for price markups of the manufacturing plants for high quality of articles they supply, since the client himself will benefit from this during permanent operation.

The contract agreement also must include paragraphs obligating the client to participate in training operating personnel, to provide the contractor with necessary production instructions, and to use his own services and laboratories to conduct tests and adjustment of equipment.

The agreement also must cover the procedure for providing the contracting organization with raw materials, the procedure for the client to acquire the finished product produced during temporary operation of the constructed project, and the procedure for allocating transport resources and shipping the finished product.

These terms must be identical to those for permanent operation so that the transition from the project's temporary to permanent operation after its turnkey delivery generates as few hindrances as possible.

The contract agreement also must provide for the transfer of limits on planning and scientific research work and must guarantee completion of blueprints within established time periods. In this connection the general planning organization becomes a direct participant in the construction and consequently in the contract agreement. The general planner himself concludes agreements with drafters of the planning estimates in a specialization unnatural to him.

The other paragraphs of the agreement must conform to the Provisional Statute on the Procedure for Planning, Financing and Material and Technical Support of Construction Sites Intended for Production and Being Accomplished on the Basis of Title Lists Which are an Immutable Legal Act for the Entire Construction Period.

Our second mistake was that the planning estimates agreed upon for conventional construction conditions were accepted for work under the turnkey method without additional expert opinion.

The fact is that, being concerned with the most rapid start of construction on the Baypazinskaya GES, which permitted employing the collective coming off the construction of the Nurekskaya GES, the NurekGESstroy managers agreed with the general planner that the power station's engineering plan would be agreed upon without scrutiny and that all criticism would begin to be remedied during detail planning. Such an arrangement is possible in construction under ordinary relationships, but it leads to reapproval of the plan in case mistakes are found. In turnkey construction the plan is not subject to reapproval. Responsibility for mistakes in the plan rested with the contractor. For example, the plan provided for fillers which could not be manufactured at the plant supplying the construction site, and so of course there was an adjustment. Thus, the volume of inert materials was determined in compacted mass while the handbook price was set for bulk weight. The list can be continued but it would appear to be enough to cite the following example: the cost of work not considered by the plan exceeded three million rubles in just the first underway complex.

Just how did the builders get out of this situation?

The advantages of the new construction method were telling: the work not taken into account was covered by the economy achieved from the builders' innovative attitude toward the job. For example, the plan called for building a bridge across the Vakhsh and for rebuilding roads on the approach to the GES. The builders made a correction: to drive a transport tunnel in place of the roads.

Of course not everything was so simple. Some corrections involved a chain reaction. That also happened with the tunnel. Its replacement of the bridge required changing the generator's dimensions. Had the client in the person of the operator appeared at the construction site at this time there would have been a scandal. The authors of such a suggestion would have been held up to ridicule. But the fact is that Uralktrotyazhmash immediately responded to the proposal of the Baypazinskaya personnel. The dimensions and weight of some components of the hydraulic generator rotor were changed, which allowed using series-produced erecting cranes with a load capacity of 160 tons instead of the 320-ton cranes being manufactured under individual orders. Replacement of the cranes in turn made it possible to reduce the height of the machine room and the expenditure of metal for crane tracks. The economic effect just from these corrections to the plan exceeded R700,000.

It is quite obvious that the plan coordination procedure requires change. The construction organization must have the opportunity for a more detailed scrutiny of the plan and, most important, for its coordination with the primary subcontracting organizations. A commission which, in addition to representatives of technical services, also must include the primary subcontracting organizations, must be set up for this purpose when the decision is being made for turnkey construction.

Our third mistake was that in the addenda to the previously mentioned Statute we stipulated the contractor's right to make changes only to the composition of temporary buildings and facilities. Working practice suggested, as you saw in the case of the tunnel, that the changes also must concern the primary project (for example, that same hydraulic generator rotor).

There are a number of still other criticisms, but we will single out the principal ones.

Experience showed that it is impossible to limit the search for reserves for reducing the production cost of construction within the framework of one column of the estimate. Once the general contractor has assumed responsibility for complying with the approved estimated cost as a whole, he must be given the right to cover expenditures from one column by a saving from another. The firmness of the established design capacity and economy and reliability in operating the project being constructed must be a limitation here. Fears that in this case the client's outlays will emerge from the control of Stroybank are groundless. This fear is caused by making a fetish of the estimate to some extent.

It is customary to believe that the estimate is a tool for determining the outlays of contracting organizations for building a project. As a matter of fact, this is far from so. For example, the plan and estimate provide for the expenditure of the most ideal materials. In fact, the builders use those allocated to them. The estimates sometimes provide for work to be done by machinery producing the optimum effect in the given operations. In fact, it is impossible to provide every construction organization with a complete set of all machinery. The work is done by that machinery which the builders have at their disposal.

In our view, a turnkey construction estimate is the limit of outlays of the contracting organization, the cost of which is what the client pays for the finished project. The bank must monitor compliance with the limit and that the credit obtained provides for work actually performed.

We realize that the Stroybank's monitoring role has to steadily increase. This is in the interests of the common cause, but since the director voluntarily assumes greater responsibility than before for the end results under the terms of the experiment, he also needs greater economic independence. He has the right to maneuver in order to accelerate project delivery. That is why the experiment is being conducted: to improve the model embodied in it and to hone legal and organizational principles.

Were all the problems of legal regulation of the parties' relationships in turnkey construction resolved at the Baypazinskaya GES? Far from all of them, of course. For example, what is to be done about reporting along TsSU [Central Statistical Administration] lines? Which balance sheet is to reflect the production of electrical energy? The industrial balance sheet? But the unit which we introduced was not placed in permanent operation. On the construction balance sheet? But this indicator doesn't fit into the accounting for industrial enterprises which are part of construction organizations. And so the energy produced by the first unit goes as unaccounted for.

Based on our experience, to what else would I like to direct the attention of those who will take part in the now mass experiment of turnkey construction which began 1 January 1985? It is important for the contractor to be given all client functions for the time of construction which provide for the

delivery of turnkey projects. An appropriate normative document also must stipulate the procedure itself for giving the contractor the means for him to carry out client functions.

The construction of turnkey projects is a new thing and in many respects it is not yet properly regulated. Much has been resolved, but much also still remains to be resolved. Participants in the experiment who are paving the way for the new construction method should not forget this.

What plans do the Baypazinskaya personnel have? Three power units are ahead, which they pledged to place in operation with the very same outstripping of deadlines as the first unit. And ahead lie new phases of the hydroelectric power station on the Vakhsh. They too are to be built as turnkey projects.

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INDUSTRIAL CONSTRUCTION

GOOD RETURN FROM CAPITAL INVESTMENT REPORTED IN UKRAINE

Kiev PRAVDA UKRAINY in Russian 2 Aug 85 p 1

[Unsigned article: "On the Course of Acceleration. Socialist Obligations Discussed and Accepted at Meetings of the Labor Collectives of an Association"]

[Text] The socialist obligations of the Sumy Machine Building Scientific-Production Association imeni M.B. Frunze for accelerating scientific and technical progress and thus increasing the growth rates of production volume and labor productivity during the 12th Five-Year Plan.

The communists and all workers at the Sumy Machine Building Scientific-Production Association imeni M.B. Frunze unanimously approve the decisions of the April (1985) Central Committee Plenum and the materials of the conference in the CPSU Central Committee on questions of scientific and technical progress. Guided by the decisions which were made, the collective is working persistently to increase production efficiency and product quality, to introduce the latest achievements of science and technology, and continuously to reduce expenditures of material and energy resources.

The crucial phase of the pre-Congress special labor effort has been successfully accomplished--the tasks of the 11th Five-Year Plan for the basic technical and economic indicators have been fulfilled ahead of schedule. By the end of the year, an additional 136 million rubles of output will have been produced, including 5.5 million rubles worth of consumer goods.

Operating under the new methods of management, the association's workers, engineering and technical personnel and employees have met in their brigades, shops, and departments to discuss all aspects of available possibilities for activating production reserves and for increasing production efficiency and, supporting the initiative of the AvtoVAZ (expansion not given), have undertaken the following obligations.

During 1986-1990, to modernize not less than 70 percent of the products being manufactured and, at the same time, to reduce time periods necessary for creation of new equipment to two-thirds or one-half of that now needed, to

assimilate 98 advance models of new, increasingly plant-ready, lines and equipment units as well as series production of 62 types of new, progressive equipment, including automated installations for intensifying petroleum extraction and a parametric series of new pumps for nuclear power plants. To increase the production of complete units of equipment. As a result of this, to achieve a reduction in the volume of construction and installation work at the compressor stations on gas trunk lines to not more than one-half the present level.

Ascribing particular importance to ensuring reliable and steady operation of produced equipment, to assimilate basically new, progressive technological processes, including laser and thermal-diffusion strengthening processes, and to double the operating life of centrifuges and of vacuum and centrifugal pumps. To organize plant maintenance services for petroleum extraction and compressor installations in the regions of Western Siberia and the Far North.

To manufacture 30 million rubles' worth of production above the control targets of the five-year plan, including 170 automated, completely fabricated sets of gas transfer equipment with a total capacity of 2 million kilowatts. To exceed established targets for increasing labor productivity by 2.5 points. By expanding specialized production capacities and mastering new types of products, to double the production of cultural and personal service goods.

To continue work on technical improvement of operational production processes and to allocate 70 percent of total capital investments earned by the association for equipment replacement. To double the renewal rates for the active part of fixed capital. By introducing progressive technological equipment, flexible production systems, means of automation and robot equipment, to free more than 500 machine-tool workers, and to reduce the relative share of manual labor by 15 percent. The assimilation of new product designs, the introduction of progressive technology, the replacement of equipment, and the expansion of production can all be accomplished on the basis of earned funds.

Perfecting economic methods of management and developing the principle of economic accountability, to ensure receipt of an additional 15 million rubles' profit in comparison with the control figures. On the basis of the fund for social and cultural measures and through its own efforts, to build 100,000 square meters of living space, preschool institutions for 840 children, dispensaries accommodating 300 patients, and enterprise subsidiary farm projects.

The workers of the Scientific-Production Association imeni M.B. Frunze ask that all these obligations be included in the state plan of the association for the 12th Five-Year Plan and assure the CPSU Central Committee that they will devote all their power, knowledge, and skill to the solution of problems aimed at accelerating the tempo of our country's social and economic development, and that they will meet the 27th Congress of our country's communist party with new labor successes.

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INDUSTRIAL CONSTRUCTION

COST ESTIMATION PROCEDURES FOR PLANT RECONSTRUCTION QUESTIONED

Moscow EKONOMICHESKAYA GAZETA in Russian No 33 Aug 85 p 13

[Article by economist V. Gramm: "Out of One Instruction--Into Another"]

[Text] It is well known that, in order to increase the effectiveness of capital investments, it is necessary to increase the scale of reconstruction and retooling work. However, it is also known that such work, while profitable to the state, is sometimes unprofitable to the construction organizations, and that they undertake it unwillingly.

The very timely decree of the CPSU Central Committee and the USSR Council of Ministers of 29 April 1984, entitled "On Improving Planning, Organization, and the Management of Capital Construction," is aimed particularly at eliminating this contradiction. The directors of customer enterprises and of construction and planning organizations have now been authorized to carry out work connected with the reconstruction and retooling of operating enterprises in accordance with coordinated estimates developed taking account of the real conditions and characteristics of performing this work. According to this document, the USSR State Committee for Construction Affairs, with the participation of interested ministries and departments, is to develop and, in coordination with the USSR State Planning Committee, to approve procedures for compiling planning and estimation documentation for this work. What has changed since then?

It must be said that the USSR State Committee for Construction Affairs has solved this problem extremely simply. By its letter of 22 August 1984, No 46-D, "Concerning the Procedure for Compiling Planning and Estimation Documentation for the Reconstruction and Retooling of Operating Enterprises," it established that planning and estimation documentation for reconstruction and retooling should be developed in accordance with the requirements of Instruction SN 202-81 which concerns the composition, drafting procedures, coordination and approval of planning, and estimation documentation for the construction of enterprises, buildings, and structures and which, with few exceptions, envisages conditions of new construction.

As a result, the "new" procedures are mostly oriented toward new construction and not toward reconstruction. Thus, it is proposed that the development of planning and estimate documentation for reconstruction and retooling of

operating enterprises be accomplished in two and in one stage, using consolidated estimation norms, consolidated indicators of the cost of construction, and the cost indicators of analogous projects for the purpose of determining estimated cost. However, these norms are usable only in those cases when the plans for reconstruction envisage the construction of new projects. There are no such norms for work under conditions of operating enterprises, and it is doubtful that there could be.

Letter No 46-D is also openly vague. For example, it establishes that, when working up local estimates, "it is permissible in necessary cases to apply incremental coefficients equaling up to 10 percent of the cost of construction and installation work which is carried out under active production circumstances (in a shop or sector) which complicate the accomplishment of this work." It is further envisaged that these coefficients are to be worked out by the planning organization and approved by the customer in agreement with the general contractor organization.

Besides the fact that a coefficient must, of course, be expressed as a figure and not as a percentage, it is still unclear how to determine what are "necessary cases" and how to work out the coefficients. And whether another figure will be justified?

Practice shows that, in order to take account of real operating conditions and characteristics in estimating the cost of reconstruction and retooling work and thus to create the conditions needed for construction and installation organizations to introduce economic accountability, it is necessary to fundamentally change procedures for working up planning and estimation documentation. First of all, a special instruction is needed concerning the composition, drafting procedures, coordination, and approval of planning and estimation documentation for the reconstruction and retooling of operating enterprises.

Clearly, it is necessary to plan the reconstruction and retooling of an operating enterprise in one stage--a working plan.

In doing this, the working drawings for reconstruction and retooling must contain all decisions regarding how the work is to be carried out, that is, planning must be done while simultaneously taking account of possibilities for accomplishing the work in the given circumstances. This special instruction must include complete guidelines for developing plans for the organization of construction (POC) and plans for accomplishing the work (PPR).

In estimating the cost of reconstruction and retooling at operating enterprises, it is necessary to consider the real conditions and characteristics of carrying out this work. Here it is necessary to rely only on specific calculations based on agreed-upon time schedules for accomplishing the work. In cases when the customer does not afford the conditions stipulated by the PPR for carrying out the work within the agreed time-frame, it will help to have an agreement drawn up by the customer and the contractor concerning the amount of compensation to the contractor for his additional expense.

It is also necessary to resolve other questions connected with determining estimated costs of reconstruction and retooling as quickly as possible. And these must be resolved in a proper way, not by merely transcribing the same regulations from one instruction to another.

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INDUSTRIAL CONSTRUCTION

MOLDAVIAN PARTY OFFICIALS FAULT CAPITAL CONSTRUCTION SHORTFALLS

Kishinev SOVETSKAYA MOLDAVIYA in Russian 20 Sep 85 p 2

[Article: "To Accelerate the Rate of Construction"]

[Text] The conference held on 18 September at the Moldavian Communist Party Central Committee was devoted to questions of capital construction and to the fulfillment of its plans in the 9 months of the final year and in the five-year plan as a whole. Invited to this conference were the secretaries of the city and rayon party committees, the managers of ministries and departments--contracting organizations and customers, Gosplan [State Planning Committee], Gossnab [State Committee for Material and Technical Supply], republic offices of the Gosbank and the USSR Stroybank, and responsible workers of the Moldavian Communist Party Central Committee and the republic Council of Ministers.

The conference stressed the fact that the current state of affairs in capital construction is having a negative effect on the republic's fulfillment of the plans for the 11th Five-Year Plan. A number of rayons and cities are poorly realizing their plan assignments, systematically not assimilating the funds allocated to them, and delaying times of operational introduction of facilities. Delays have been allowed in the construction and growth of capacities of the Rezina Cement Combine, the Kishinev Tractor and Television Plants, the "Volna" Production Association, the Bendery Silk Combine, the Beltsy Plant imeni V. I. Lenin, and other enterprises. The construction of residential houses and facilities of social-domestic function is not being implemented everywhere at the necessary level. Altogether throughout the republic in 8 months the limit of capital investments has been realized by 86 percent, and 130 million rubles remain unassimilated. It was also noted that certain party gorkoms and raykoms do not give enough attention in their work to questions of capital construction, do not give a principal evaluation to the situation which has arisen in this construction, and do not take effective measures for eliminating the shortcomings which have been allowed.

In light of the tasks presented in the speeches of CPSU Central Committee Secretary General, comrade M. S. Gorbachev and in the resolutions of the CPSU Central Committee, including also on the accounting of the Moldavian Communist Party Central Committee, the party and economic managers must give primary attention to the fastest possible completion of construction and the timely

operational introduction of the most important national economic facilities, residential houses, schools, hospitals and polyclinics, and children's pre-school institutions. The question of providing construction sites with a work force by means of internal reserves, the effective application of this work force, the creation of necessary production and social-domestic conditions for the people must be approached with greater responsibility. The activity of the customers who are responsible for the late operational introduction of around half the facilities should be taken under constant control. They must verify the availability of equipment for start-up construction sites, complete unit assembly of this equipment in time, and staff the user personnel so as to render aid to the builders.

The conference outlined a series of organizational and political measures which provide for comprehensive development of the system of control, increased responsibility of the work force, mobilization of the labor collectives toward the unconditional fulfillment of all monthly plans by the building collectives in the fourth quarter, as well as the fulfillment of all adopted socialist responsibilities.

The party gorkoms and raykoms have been assigned the task of monitoring the fulfillment of the established plans by the building materials industry enterprises and delivery of products for large-panel house building and other structures and parts. The preparations for work at construction sites under winter conditions must be performed with particular thoroughness. The zero cycles must be completed before the frosts set in, mortar-concrete centers must be supplied with heat, and the necessary reserve of rubble, sand and other materials must be prepared.

The conference examined the tasks of formulating long-term plans for the 12th Five-Year Plan within the labor collectives.

Moldavian Communist Party Central Committee Secretary V. F. Semenov spoke at the conference.

12322
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INDUSTRIAL CONSTRUCTION

POOR PLANNING BLAMED FOR SLOW GROWTH OF INDUSTRIAL CENTERS

Moscow EKONOMICHESKAYA GAZETA in Russian No 43, Oct 85 p 10

[Article by A. Platunov, chief specialist, general plan administration, Leningorispolkom GlavAPU: "Industrial Centers: What is Hindering Their Development?"]

[Text] One of the tested means of increasing the effectiveness of capital investments is the group construction of enterprises of various departmental appurtenance within the composition of industrial centers. The overall savings in capital investments as compared with separate construction comprises from 3 to 12 percent. There is an average 10 percent reduction in the building territory and in the length of automobile roads, and almost a 20 percent reduction in the extent of railroads. The number of buildings and structures is reduced to three-fourths. All this leads to considerable savings of labor resources.

According to the data of the USSR Gosstroy [State Committee on Construction Affairs], almost 500 industrial centers have presently been formulated in the country, and include around 7,000 enterprises.

Leningrad is one of the first major cities in the country on whose territory industrial centers began to be developed in the mid-60's. Another 13 centers are currently being built, which unite around 250 enterprises of more than 60 ministries and departments, as well as Leningorispolkom [Leningrad City Executive Committee]. Others will also be developed.

It would seem that the question is clear: the future favors industrial centers. And this is really so, since there are no alternatives for means of improving organization in industrial construction. Nevertheless, only every fourth or fifth enterprise in the country is built in complex with another. Even in Leningrad, not everything is proceeding as we would like. For example, there are over 50 industrial-warehouse zones here, but industrial centers have been formulated in only 7 of them.

Why is it that this most progressive and promising form of organization of construction and reconstruction is not developing as actively as we might expect?

An analysis of many years of experience in developing Leningrad industrial centers and the conclusions and recommendations of republic and all-union

conferences held at the initiative of the USSR Gosstroy recently on this question give a basis for affirming the following: the main obstacle in the path of developing industrial centers is the absence of a system of intersectorial management at all stages of their development--in formulation, construction, and functioning.

A STRANGE CUSTOMER

To formulate a multisectorial industrial center means to develop and to approve its scheme, which is the only technical and legal document making it possible to begin building. The scheme must indicate the place of development of the center and define the make-up of the enterprises as well as the time and estimated cost of construction for each of them. This same document also covers all-center facilities (their make-up, place of location, capacity and productivity, and estimated construction cost). One of the important factors are the data on the amounts of contributions by each enterprise toward the construction of common facilities.

There are two types of such schemes: the scheme of the general plan for the industrial center, and the scheme for ordering existing building of the industrial area. The territorial project planning institutes are charged with the development of these schemes. The customer for the schemes is the USSR Gosstroy.

This customer is strange from an economic standpoint: he has no direct relation to the solution of the problem of locating the production forces. He does not possess the necessary and reliable information on where, when, which and how many enterprises must be built and introduced into operation or on which ones are in need of reconstruction or expansion. No offense meant, but the USSR Gosstroy, with its present functions, is in no condition to resolve the main question: in which industrial regions must industrial centers be organized and where must new ones be built?

Such information is concentrated and processed in the USSR Gosplan [State Planning Commission] and the gosplans of the union republics. Naturally, they must be the chief initiators in planning the development of industrial centers. But how can they deal with planning the development of industrial centers if these organs do not have the appropriate structural subdivisions! This is where the elemental nature of the process begins.

"PASSING THE HAT"

The next step is the building of the industrial center: the construction of the enterprises and the facilities of various function which will be common for all. Unfortunately, this process is also not distinguished by its order.

Let us assume that an industrial center includes 30 enterprises which are not technologically associated with each other (and this is also one of the peculiarities of an industrial center as compared with a production complex, in which the enterprises are tied together by a single technological chain for the output of a finished product). There are around 20 builders--various

ministries and departments. The production output of each of these enterprises is planned separately. The construction or reconstruction, expansion, or technical retooling times are determined in the very same way.

The planning of construction of the common center facilities is placed upon the chief builder. This role, as a rule, falls to one of the most energy-consumptive enterprises (for a number of reasons there may be several chief builders in the industrial center by types of engineering or transport provision). His main task is to ensure the operational introduction of the common facilities by the time of operational introduction of the enterprises in the industrial center and to organize their reliable operation. The chief builder must take the expenditures for the common facilities on his own balance account.

All this means additional and considerable trouble, and the enterprises are not eager to take on the function of chief builder. The chief builder has no benefits from the participating enterprises, and there are no provisions for his receiving compensation for the necessary material outlays.

In the development of the scheme for the industrial center, every builder promises to compute his share in a timely manner and in a specified amount. In actuality, however, the chief builder is forced to "pass the hat." The participants have a multitude of excuses and are in no hurry to hand over their share.

All this gives rise to "long building" and freezing of the capital investments. The planned return on capital is put off "until later"...

THE EXPERIENCE IS THERE. HOW TO APPLY IT?

What must be done to see that the development of industrial centers is manageable at every stage?

It is necessary first of all to develop the "Basics for Managing the Development of Industrial Centers." More than enough valuable proposals have been expressed on this subject, including in the pages of the weekly newspapers. The task now is to closely examine and analyze them.

It is expedient to study the experience of the countries in the socialist alliance on this question. We should also not reject rational concepts of creating block-sections for group industrial construction as used in the developed capitalist countries.

Obviously, we also cannot overlook Leningrad's experience in formulating industrial centers and in the construction and operation of all-center facilities. This experience, by the general consensus of specialists, is still unique in our country.

The Main Architectural-Planning Administration of the Lensovet ispolkom is involved in the solution of the most complex urban construction problem on

siting enterprises on the city territory here. It defines the strategy and sets the basic line in this question. The project for detailed planning of the so-called non-residential zone where the center will be formulated resolves practically all the principle questions. In connection with this, the territorial project planning organization has all the necessary data for developing the industrial center scheme.

The single and constant chief builder of common facilities in all the industrial centers of Leningrad since 1975 has been the Lengorispolkom, represented by the Main Administration on Capital Construction. The enterprises are sure of the fact that all-center facilities for engineering provision and transport will be built for them in time.

This is really so, although few people know what difficulties the Lengorispolkom must overcome in collecting the share funds.

The question of operation of common facilities has been resolved in a principally new manner in the Leningrad industrial centers. After completion of construction, they are signed over to the balance of specialized operational organizations of the city and ministries who are obligated to work with the engineering and transport facilities of city management.

The Leningrad system of developing industrial centers has been approved by the USSR Gosplan, the USSR Gosstroy, and the RSFSR Gosstroy, and has been recommended for promulgation. However, we may say with full assurance that only in the presence of a well thought-out state system of management of the formulation, building and functioning of industrial centers will their significance in increasing the economic effectiveness of capital investments and fixed capital be maximal.

12322
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INDUSTRIAL CONSTRUCTION

FASTER MATERIALS, MACHINERY OUTPUT TARGETED IN 12th FYP

Moscow EKONOMICHESKAYA GAZETA in Ruaisn No 43, Oct 85 p 7

[Article by P. Pavlov: "Reserves for the Industrialization of Construction"]

[Text] At the present time, the level of prefabrication in industrial construction comprises approximately 40, and in residential construction--60 percent. Industry has assimilated the output of a number of new and highly effective building materials. For example, the production of wood laminate structures has increased by 23 percent in the 11th Five-Year plan. The production of arbolite has increased by a factor of 1.8, of stock buildings--by 25 percent, and of decorative ceramic slabs--by a factor of 1.5. The application of effective types of sheet metal stock grades in construction in 1985 is 22 percent as compared with 11 in 1980. The application of profiled metallic sheeting will increase by 1.5 times. The manufacture of high rigidity mineral wool slabs has been increased by 2.3 times. Superplasticizers and other chemical products are being introduced into the practice of building production. Every year, ever more high productivity technology is being made accessible to builders.

However, the state of affairs in capital construction is improving slowly. As noted at the April (1985) Plenum of the CPSU Central Committee, many facilities are under construction for an unreasonably long time. As a result, considerable material goods are frozen. The growth in capacities is being delayed, and the country does not receive the production in time. To accelerate the socio-economic development of the country, it is necessary to cardinally increase the effectiveness of building production.

IMMEDIATE TASKS

The resolution adopted by the CPSU Central Committee and the USSR Council of Ministers entitled "On the Further Development of Industrialization and Increased Labor Productivity in Capital Construction: ("EG" No 36) provides for the implementation of a set of measures in the 12th Five-Year Plan aimed at creating a material base and conditions for the changeover in capital construction to a qualitatively new stage in its industrialization, and primarily at the expense of expanding the volumes of plant manufacture of unit buildings and structures of various function, progressive building materials and designs, increasing the degree of their building readiness and degree of complement

provisions, and widespread application in construction practice of the latest achievements in science and technology and leading domestic and foreign experience.

In the 12th Five-Year Plan there are plans to significantly increase the volumes of large panel and volume-block house building and the output of complement buildings and structures based on lightweight metallic and other effective designs and materials. The task has been set of increasing by 1.5-2 times the manufacture of structures based on profiled sheet stock and aluminum alloys. The output of progressive materials and products based on asbestos cement, cellular concrete, gypsum, wood and polymers will increase even more. The production of stock type mobile buildings for equipping construction sites is increasing, as well as the production of complement-block buildings of auxiliary production function.

Minstroydormash [Ministry of Construction, Road and Municipal Machine Building] has been given the task of ensuring in the years 1985-1990 the development and assimilation of series production of a number of new types of building technology and the development of the output of machines, mechanisms and instruments for comprehensive mechanization of construction and installation work which are currently in short supply. We are speaking about an annual renewal of the nomenclature of manufactured production by no less than 10 percent. By the year 1990, the production of interchangeable equipment for excavators, cranes and fork lifts will increase by 1.5 times. The resource of the work of hydraulic drive units and the operating time for breakdown of primary machines will significantly increase. The labor consumption of technical servicing and repair will be reduced to 2/5 to 1/2 the present amount.

DEVELOPMENT OF THE PRODUCTION BASE

Considerable potential has been accumulated within the country's building complex. The output-capital ratio of building production has doubled in the last 10 years.

However, as concerns the production base of construction, its development in recent years has taken place at a lower rate than the growth of construction-installation work throughout the national economy as a whole. The principle of the need for a leading development of the base turned out to be disrupted to a certain degree. There was a "distortion" between its possibilities and the increased demands of construction.

The development of production of progressive, highly industrial building materials and designs has clearly lagged behind. The traditional materials by far do not always ensure the necessary reduction in expenditures, and in a number of cases they have become the obstacles in the path of technical progress in construction.

With a general sufficiently high saturation of construction with technology, many types of operations and jobs are still not mechanized. There is the absence of a list of building materials and mechanisms, the attachment and hitching equipment to these mechanisms, and certain types of motor transport and instruments

which would ensure the comprehensive mechanization of all stages of building production.

Much depends on the builders themselves and on their ability to prudently manage the production potential which has been accumulated, on their creative approach to the introduction of progressive technical innovations. In the Belorussian SSR Minpromstroy [Ministry of Industrial Construction], for example, 85 people are enough to fulfill a volume of construction-installation work in the sum of a million rubles, while at the Glavsevzapstroy (Petrozavodsk) and Glavastrakhanstroy approximately 120 people are required. These data, while testifying to the different level of labor productivity, at the same time indicate also the non-uniform attitude toward industrialization of construction.

In this connection, the task of implementing measures for increasing the effectiveness of application of the available building technology and the further development of comprehensive mechanization of plastering, painting, roofing, concrete placing, cargo handling and other labor consumptive operations as set forth for the ministries and departments performing construction and installation work takes on particular significance. This would reduce the volume of manual labor in construction by no less than 20 percent in the 12th Five-Year Plan.

AT SITES IN WESTERN SIBERIA

The resolution of the CPSU Central Committee and the USSR Council of Ministers provides for a changeover beginning in 1987 to the delivery of technological equipment in large blocks of high plant readiness to under-construction enterprises in ferrous and nonferrous metallurgy, electroenergetics, and the chemical, petrochemical, petroleum processing, petroleum, gas, coal, food and light industries, as well as the building materials and mineral fertilizer industries. Here it is assumed that the manufacturing plants must take direct part in the installation and start-up and must bear full responsibility for bringing the equipment to project parameters. In 1986, we must complete the introduction of the system of production-technological complementation at all construction-installation organizations. This would ensure the changeover to delivery of building designs and parts in technological sets to facilities under construction.

The solution of these problems is of primary importance for the remote regions of new construction in Siberia and the Far East.

It was noted at a meeting of the party-management active membership of Tyumensk and Tomsk Oblasts that in this region the work volume every year is enough to build two Volga auto plants, and every two years--the BAM [Baykal-Amur Main Line]. Siberians are the initiators of the leading unit-block method of building industrial facilities. However, the managers of the USSR Gosstroy and the ministries--both customers and contractors--are approaching the questions of industrialization in construction without the necessary scope.

The building industry enterprises of the main contractor for the construction of the West Siberian complex--Minneftegazstroy [Ministry of Construction of Petroleum and Gas Industry Enterprises]--provide only 45 percent of its needs

for reinforced concrete products, 60 percent of its needs for KPD [large-panel housing] parts, 70 percent of its needs for metal panels with insulation, 35 percent of its needs for carpentry parts, 25 percent of its needs for steel structures, and 20 percent of its needs for non-metallic materials. This percentage should and must be greater.

Of the 26 plants producing ZhBI [reinforced concrete products], metal molds, keramzit, sanitary technical provisions and others scheduled for the 11th Five-Year Plan, Minneftegazstroy has still not even begun planning on 10 of the facilities, and only project design work is being performed on 5 others.

Glavtyumenstroy materialy, created within the system of the RSFSR Minstroy-material [Ministry of the Building Materials Industry], is extremely slow in picking up its pace. The production of brick, nonmetallic materials and lime is essentially at the same level as in 1980. The capacities on porous fillers and ceramic tiles are only half utilized, and those for the production of clay brick only slightly more so. In reality, the glavk can give an additional 70 million units of brick, 30,000 tons of lime, 90,000 cubic meters of keramzit, and 200,000 square meters of tiles annually.

At the same time, around 3 million cubic meters of reinforced concrete structures, 85 million units of brick, over 9 million cubic meters of nonmetalliferous materials, 44,000 tons of lime, around 20,000 tons of gypsum, and over 500,000 cubic meters of mineral wool insulation are brought to the construction sites of the West Siberian petroleum-gas complex every year from other rayons. It is necessary to step up the production of these materials in the region itself.

* * *

The industrialization of construction and the accelerated development of its production base on a new technical basis is the guarantee of the successful fulfillment of the new plans associated with the huge creative program of construction for the 12th Five-Year Plan.

12322

CSO: 1821/58

INDUSTRIAL CONSTRUCTION

BRIEFS

AKADEMGORODOK COMPUTER CENTER OPENS--Irkutsk--"Thank you builders!" was written on the banner hung in the assembly hall of the Irkutsk Akademgorodok, where a ceremonial meeting was held on occasion of the delivery for operation of a large computer center complex of the East Siberian Branch of the Siberian Department of the USSR Academy of Sciences. Akademgorodok has become one of the best planned rayons of the city. Builders are providing scientists here with good conditions for creative activity. Last year, for example, a unique solar radiotelescope was placed in operation. The new computer center now has begun to function and preparations for construction of an experimental base are in full swing. [By P. Adamov] [Text] [Moscow STROITELNAYA GAZETA in Russian 7 Aug 85 p 1] 6904

CSO: 1821/028

HOUSING CONSTRUCTION

RETAIL STORES TO SELL RESIDENTIAL CONSTRUCTION MATERIALS

Tallinn RAHVA HAAL in Estonian 14 Jun 85 p 1

[Article by Jaak Talb: "Construction Materials from New Store"]

[Text] A new and modern store of the "Eesti Taara" association opened at 42 Viaduct Road in Tallinn. Individual builders now have the opportunity to choose for themselves the necessary paints, wallpaper, mixers, pipe-connecting parts, and much more in a spacious (320 square meters in size) and well-lit store. The sale of larger construction materials, however, remained in the yard. Samples of the materials on sale right now are displayed in a separate room located next to the store.

The new building was designed by the Tallinn branch (architect: Toomas Kivi) of the "Central Soyuz Project" institute. It was built by the 1st construction board of the Construction Trust and was accepted with very good evaluations by the customer. The building has a useful surface of 2,340 square meters and--in addition to the showrooms--has capacious storerooms, living rooms for the clerks and transport workers, a large assembly room, and a dining hall with 50 seats. A center for distributing information about merchandise which is and will be on sale and a center for ordering taxi trucks were opened in the same place.

Expansion of the territory of the construction-materials sales center is now in progress on Viaduct Road. It is approaching a surface of more than 3,000 square meters. There, under conditions more open than up until now, lumber and metal products are starting to be sold.

The expansion is in every respect opportune, because the population's building activity increases from year to year. Total sales of construction materials at the "Eesti Taara" trading base in Tallinn jumped 16 percent during the first 3 months of this year in comparison with the same interval of last year.

12327

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HOUSING CONSTRUCTION

ATTEMPTS AT MINIMIZING COST OF RURAL HOUSING CONSTRUCTION

Moscow STROITELNAYA GAZETA in Russian 16 Aug 85 p 2

/Article by V. Akhlomov, Yaroslavl: "According To a Stable Price"/

/Text/ It is a well known fact: the cost of 1 square meter of living space in rural buildings is increasing with each passing year. How can it be reduced? How can the construction costs for dwellings be lowered without lowering their operational qualities and the degree of comfort they provide?

In this article we wish to acquaint the readers with an economic experiment that is being carried out this year in the RSFSR Minselstroy /Ministry of Rural Construction/.

The goal of the experiment is to lower the expenditures of labor and material resources during the development and implementation of plans for rural dwellings, based upon the introduction of scientific and engineering achievements and leading experience.

The conditions of the experiment: the use of stable estimated prices per unit of construction product -- 1 square meter of living space. They must not exceed the normative cost established for a specific region. These prices are constant over a period of 5 years.

Contractual organizations, jointly with the planners, clients and construction industry enterprises, introduce specific recommendations for lowering the material-intensiveness during the course of developing the plan and carrying out its construction. The savings realized from carrying out these recommendations remain with the participants in this work in the form of bonuses and become an additional source for the economic stimulation of workers.

Participants in the experiment: planning and scientific-research institutes, client-organizations and rural construction combines of the RSFSR Minselstroy.

The decision was made to carry out the experiment at six rural construction combines. One of them has become the SSK (rural construction combine) of the Yaroslavselstroy Trust.

Nor was this trust selected by accident. The collective here is stable and works in a steady manner as it successfully carries out its tasks. During 4

years of the five-year plan, more than 15,000 square meters of living space were placed in operation over and above the plan. This consisted mainly of 18 and 27-apartment large-panel buildings of the "25" series. These buildings were developed by the rural construction combine of Yaroslavselstroy.

Statement by Ye. Maleyev, manager of the Yaroslavselstroy Trust:

It is hardly necessary to state once again that the economic expenditure of material, labor and financial resources is one of the most important conditions for raising production efficiency. In capital construction, this is dependent for the most part upon close collaboration between the planners, contractor, client and the construction industry enterprises. The experiment under discussion here attracted out attention mainly owing to the fact that it motivates each individual to search for reserves and economies in the use of material resources. In particular, this is promoted by material interest. As is known, the total amount of savings realized from the implementation of plans remains at their disposal. And this represents a considerable amount of money. For example, the planners receive 20 percent of the amount saved and the SSK and sub-contracting organizations -- 35 percent. But in order to receive these deductions, each must perform in a strong manner. For example, the deductions are lowered to 50 percent if the schedule for placing a project in operation is disrupted and also if a grade of only "satisfactory" is assigned for the quality of the work carried out.

A stable price for one square meter of overall space in a dwelling is developed based upon an analysis of the planning-estimates documentation for each type of dwelling. We performed such work jointly with the institutes Yaroslavgrazhdan-proyekt, YaroslavTsMPI and the KB /Design Bureau/ for Reinforced Concrete imeni Yakushev and we also coordinated the stable prices for 1 square meter of space in an 18 or 27-apartment dwelling with the interested organizations. In our oblast, their value amounts to 183 and 174 rubles respectively.

This step became a starting point for our actions aimed at lowering the estimated cost for a square meter of dwelling space.

As I understand it, the organizational aspect of the experiment is as follows: Its participants, particularly the builders and planners, introduce recommendations for the rationalization of the planning solutions and for the introduction of scientific and engineering achievements and leading experience, in the interest of reducing material and labor expenditures. These recommendations are analyzed, generalized and coordinated with all of the interested organizations. The planners, for example, inform the builders regarding any specific changes they introduce into the documentation and they provide figures on the savings expected from their implementation. The contractor does the same. They jointly evaluate the nature and advisability of the changes introduced and also the possibility of implementing them. In short, they work as one.

Last year, Yaroslavselstroy introduced on an experimental basis some recommendations for lowering the estimated cost for erecting six dwellings. And the result: labor expenditures were lowered by 778 man-days and a savings of 14 tons of metal and 29 tons of cement was realized. The estimated cost for 1 square meter was reduced by 2.2 rubles.

I cannot state that the work became easier. To the contrary, it became considerably more complicated. The contractor had to consider the technical innovations embodied in the plan and without lowering in the process his former indicators. But I did not hear one of the Yaroslavlstroy workers grumbling over the difficulties. Nor was it simply a matter of thorough preparations being made in the trust for carrying out the work on a new basis. It is believed that the essence of the matter lies in the fact that the collective of Yaroslavlstroy and its engineering-technical service turned out to be psychologically prepared for reorganizing production and for introducing various innovations. Here one out of every three efficiency experts is mastering an allied profession and in undertaking courses aimed at raising his qualifications.

A statement by I. Ivashchenko, chief of a rural construction combine:

We have defined two principal trends for reducing expenditures: a change in the construction portion of dwellings being erected and a reduction in material-intensiveness.

For example, floor slabs 160 mm thick were employed earlier. We replaced them with ribbed types and thus saved more than 1 ton of cement per dwelling. The introduction of progressive contour-concentrated fittings for internal walls made it possible to reduce the consumption of fittings. Thus, we are reducing expenses for many units, structures and parts in terms of "small items." We are constantly raising the plant readiness of goods, in the interest of reducing labor expenditures at the construction site. For example, we are producing stair landings and flights of stairs in a complete state of plant readiness.

In all, these measures are having a substantial effect. The estimated cost for 1 square meter of dwelling space is decreasing on the order of 10 rubles. In the process, a sharp reduction is taking place in labor expenditures and a large savings is being realized in the use of metal and cement.

This year the plans call for the construction of 19 experimental dwellings with an overall area of 20,400 square meters and a savings in excess of 146,000 rubles. We will cope with the task and we will obtain a bonus fund in the amount of 19,000 rubles.

However, we cannot rest content with that which has already been achieved. By no means is full use being made of the available reserves. Next year the plans call for 20 such dwellings to be built and with greater economic effect -- 224,000 rubles. We have already prepared a schedule for flow line construction for a two year period which has been coordinated with the client and the general contractor. Thus, a considerable amount of work remains to be carried out in the future.

Only one more fact needs to be mentioned. In addition to the Yaroslavl Rural Construction Combine, the Primorskiy, Vyazemskiy, Priokskiy, Omskiy and Engelsskiy SSK's of the RSFSR Minselstroy are also participating in the experiment. No favorable terms are being created for them. However, as you can see, their initial experience is producing fine results.

7026

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HOUSING CONSTRUCTION

HOUSING STARTS, COST FACTORS IN RURAL AREAS SURVEYED

Moscow STROITELNAYA GAZETA in Russian 18 Aug 85 p 1

/Article: Industrially Means Effectively; Intensifying Production Is the Task of Rural Builders"]

/Text/ This present five-year period has been a special one for the rural builders. Together with other partners in the agroindustrial complex, they are participating in the work concerned with carrying out the Food Program of the USSR. This includes one of the most important trends in this work -- housing construction. The solving of this social task, as is well known, is promoting to a large degree the retention of personnel on the kolkhozes and sovkhoses.

What are the results of the work already carried out? During the 1981-1984 period, 132 million square meters of overall housing space were placed in operation -- 12 million more than during the same period for the 10th Five-Year Plan. Two thirds of the housing was erected using state and kolkhoz resources. Statistics reveal that compared to 1979 the average amount of living space available to a rural resident has increased from 13 to 14.7 square meters. Farmstead dwellings with farm buildings constitute 70 percent of the overall volume of housing space being placed in operation in the country's rural areas.

Such considerable quantitative and qualitative changes in the transformation of the housing fund became possible mainly owing to a purposeful change in the structure of the capital investments allocated for rural development: during the years of the current five-year plan, the proportion of non-productive construction has increased from 17 to 29 percent.

However, the accelerated development of farmstead construction has brought about an increase in the cost of rural housing, at times an unjustified increase. Thus, compared to 1979 the average cost of one square meter of space in a farmstead dwelling, built by the state and kolkhozes, increased by 18 percent and according to data obtained from a random inspection by the USSR TsSU /Central Statistical Administration/ it presently amounts to 236 rubles and in some areas this amount is considerably greater. For example, in Chita and Vologda oblasts this figure has reached 340 rubles, in the Ukrainian SSR -- 385 and in Sverdlovsk Oblast -- 452 rubles.

It will obviously be difficult to carry out fully the social tasks assigned to the rural builders for the 12th Five-Year Plan, if serious attention is not given to the economics of farmstead housing and particularly if the construction

costs for such housing are not decreased considerably. Indeed the volume of contractual work for USSR Minselstroy /Ministry of Rural Construction/ during the 1986-1990 period alone must be increased by more than 20 percent, or higher by almost threefold compared to the present five-year period. Moreover, the proportion of the most labor-intensive work -- non-productive construction -- will increase noticeably during the forthcoming period. In order to carry out the work planned, it will be necessary first of all to make maximum use of the achievements of scientific-technical progress.

One of the basic conditions for raising efficiency is the development in all respects of high quality planning-estimates documentation. Indeed, 90 percent of the installations being built in the rural areas are being erected on the basis of standard documentation and thus the "cost" of any mistake will increase many times over.

Unfortunately, proper attention is still not being given to planning. In some instances the agricultural and architectural-construction organs, planning organizations and kolkhoz and sovkhoz leaders are tolerating the use of standard and individual plans involving oversized areas for dwellings and auxiliary facilities, increased expenditures of materials and fuel and inefficient space-planning solutions. Quite often the expenditures for the engineering networks are not properly taken into consideration.

The farm buildings are extremely expensive. For example, the coordination of a plan for a farm building having a bath and a garage, created by specialists at the Uralgiproselkhozstroy Institute, increased the estimated cost of construction for a single-apartment 4-room dwelling at the Verkhnepyshminskiy Sovkhoz in Sverdlovsk Oblast by 60 percent. Similar facts, with the cost of farm buildings for farmsteads reaching 7,000-10,000 rubles and higher, are being uncovered in Bryansk, Kuybyshev, Gorkiy and Novosibirsk oblasts, Khabarovsk Kray, the Belorussian SSR, Baltic republics and in a number of other areas.

The decree of the USSR Council of Ministers on further improvements in planning-estimates work called for specific measures aimed at raising the effectiveness of capital investments. The fund for standard plans, from which developments which do not conform with the modern scientific and engineering achievements are excluded, must be reviewed and revised as rapidly as possible.

Success in carrying out this large-scale work will also depend upon the rates for the development and technical equipping of the industrial base. The level of industrialization for rural housing construction continues to remain low. Thus USSR Minselstroy is providing less than one half of its housing space in dwellings erected using prefabricated structures. At the same time, the available capability for completely prefabricated housing construction here is only being utilized by 55 percent. A substantial improvement is required in the structure of housing construction. Today the principal portion of the output by subunits of the ministry (almost 75 percent) consists of dwellings of the sectional type.

The rural construction ministries of union republics, particularly the Ukraine, Uzbekistan, Azerbaijan, Lithuania, Kirghizia, Armenia and Turkmenia and the republic mezhkolkhozstroy associations must undertake immediate measures aimed

at strengthening the construction industry base and ensuring its modernization and technical re-equipping in connection with the conversion over to the production of farmstead dwellings. In the process, special attention must be given to the rural construction combines -- the most progressive organizational form for contractual construction in the rural areas.

The new and high quality development of rural housing construction will be dependent upon how extensive will be the use of progressive and local materials, such as arbolite, cellular concrete, gypsum and wood. Use of the monolithic method on an industrial basis and structures having raised thermal-engineering characteristics should be introduced into operations in a more bold manner. However, despite the leading experience that has been accumulated in this regard, the contractual organizations (particularly in Novosibirsk and Kuybyshev oblasts, the Armenian and Georgian SSR's and in a number of other regions) appear to be in no hurry to do this. The local agricultural organs, together with the planning organizations, are introducing changes in the standard plans and this in the final analysis is increasing the housing costs and lowering the effectiveness of construction.

On the threshold of the 27th CPSU Congress, the rural house builders are confronted by many innovative, large-scale and difficult tasks associated with converting over to the path of intensification. This path is a component part of the overall program for developing the country's economy, as set forth in the decisions handed down during the April (1985) Plenum of the CPSU Central Committee and the June conference in the CPSU Central Committee on matters concerned with accelerating scientific-technical progress and also the recently adopted decree on the industrialization of construction. The union republic gosstroy's, minselkhoz's /ministries of agriculture/, minselstroy's and mezhkolkhozstroy associations must undertake urgent measures aimed at raising the responsibility of the leaders of planning and construction organizations with regard to lowering the cost and improving the quality of housing in the rural areas.

7026
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HOUSING CONSTRUCTION

PRAVDA ON TULA OBLAST HOUSING CONSTRUCTION SHORT FALLS

PM051317 Moscow PRAVDA in Russian 3 Dec 85 First Edition p 2

[Unattributed report: "At the USSR Supreme Soviet Presidium. On Tula Oblast Soviets' Work to Ensure the Fulfillment of Targets on the Construction of Housing, the Improvement of its Quality, and the Observance of the Requirements of Legislation on Maintenance of the Housing Stock"]

[Text] As has been reported, at a 25 November session the USSR Supreme Soviet Presidium examined the question of Tula Oblast soviets' work to ensure fulfillment of targets on the construction of housing, the improvement of its quality, and the observance of the requirements of legislation on the maintenance of the housing stock.

In a resolution on the matter the USSR Supreme Soviet Presidium noted that the Soviets, under the leaderships of party organs, are carrying out measures to construct housing, improve its quality, ensure out measures to construct housing, improve its quality, ensure the maintenance of the housing stock, and improve citizens' living conditions. In the 11th 5-Year Plan a total of 2.9 million square meters of housing have been commissioned. This has provided better housing conditions for 60,000 families. The provision of housing amenities has improved. Cities and urban settlements have been provided with the main types of public utilities. Housing management is improving, and the material and technical base for the maintenance and repair of housing is being developed.

At the same time, the oblast's soviets have failed to exploit all the opportunities and all their powers to ensure fulfillment of housing construction targets and are failing to make the proper demands on economic organizations. In 1981-1984 the plan for commissioning apartment blocks in the oblast was fulfilled by only 79 percent, and [this year's] 9-month plan in 1985 was fulfilled by only 73 percent. The consequence of this was that working people failed to receive over 650,000 square meters of housing, which exacerbated what was already a bad housing provision situation. This has given rise to many complaints.

The USSR Supreme Soviet Presidium drew the attention of the oblast's soviets and their ispolkoms to the fact that housing commissioning is erratic and that most of it is commissioned in the fourth quarter, especially in December.

This gives rise to crash programs and a sharp deterioration in work quality. The consequence is that apartment blocks are often found to have gross defects and extra effort and money are needed to eliminate them. In 1984 State Architectural and Construction Supervision inspectors halted construction of a number of apartment blocks because of poor-quality construction work. Some Soviets are failing to display the proper, principled approach and often agree to accept and arrange for the occupation of defective blocks.

The construction and construction materials industry base is not developing properly. Enterprises lack mechanized lines for full prefabrication of structural components. This year only 18 percent of the blocks will be constructed on the basis of improved plans--the average for the USSR Ministry of Industrial Construction being 58 percent. There have been serious shortcomings in construction work in population centers, with a failure to ensure integrated development and with an intolerable backlog in terms of the construction of social facilities and site preparation.

The Soviets are not concentrating enough capital investment in housing construction. They have practically halted work on increasing the involvement of enterprises and organizations in housing construction.

The proper attention is not being paid to developing house-building cooperatives and to finding local resources for the expansion of house building. Despite the considerable increase in the number of citizens wanting to join cooperatives, the volume of cooperative construction is dwindling and plans for commissioning house-building cooperatives' blocks are not being fulfilled.

Soviets are failing to recognize the acuteness of the situation concerning the provision of housing for work people, their supervision of the observance of established procedures for granting housing is poor, and they do not involve the public sufficiently in this work; there have been gross violations of housing legislation and malpractice in the allocation of apartments.

Work on matters relating to maintenance of the housing stock is still poor. Failure to fulfill plans for apartment repairs, in particular to departmental housing, which constitutes 70 percent of the total stock, is an annual event. Repair organizations lack the requisite production-technical base. This is having an adverse effect on housing maintenance and it means that the population's requests for housing repairs are not being fully met. Superior enterprises and organizations located in the oblast are not contributing enough to the solution of these questions.

The housing stock of coal industry enterprises is in an extremely unsatisfactory condition. The leaders of USSR Coal Industry Ministry and USSR Industrial Construction Ministry enterprises are responsible for a serious lag in the fulfillment of targets on the commissioning of housing and other facilities to improve housing and consumer conditions for coal industry workers in Tula Oblast.

The oblispolkom is by no means making full use of its powers to coordinate and supervise the housing construction activities of enterprises and organizations

which are under the jurisdiction of higher bodies. The transfer of the departmental housing stock to local soviets is too slow: in the last 4 years the number of square meters transferred was 200,000 below target.

Oblast soviets and construction organizations are not paying due attention to improving the conditions for construction workers' labor and everyday life, which is leading to high cadre turnover. At the moment the organizations carrying out housing and civil construction are short of over 6,000 workers. Production discipline and order are lacking in some places. For example, at the "Tulpromstroy" trust and "Tulgorstroy" administration losses of working time due to violations of labor discipline have doubled this year.

The aforementioned shortcomings in housing construction and violations of legislation have also occurred in some other oblasts and republics. Each year the councils of ministers of the Kazakh, Uzbek, Moldavian, Tajik, and Turkmen union republics and the Smolensk, Kemerovo, China, and Kalinin Oblispolkom fail to ensure fulfillment of state targets on housing construction. The ministries of the Petroleum Industry and Power Machine building and some other USSR ministries regularly fail to fulfill housing construction plans.

The USSR Supreme Soviet Presidium described as unsatisfactory the situation in Tula Oblast as regards the construction of housing, its quality, and housing repairs. The oblast soviet and its ispolkom were told to adopt resolute measures to eliminate the shortcomings forthwith and display greater activeness in striving to fully implement CPSU Central Committee and USSR Supreme Soviet Presidium resolutions on questions of ensuring fulfillment of plans for the construction of housing and maintenance of the housing stock.

Soviet and their ispolkoms and the relevant economic organizations were given the tasks of: ensuring the unswerving fulfillment of plan targets on the construction of housing, comprehensive development of every city and rayon, and organization of the steady commissioning of housing without postponing the construction of apartment blocks until the end of the year. Carrying out tougher supervision of construction, installation, and finishing work and strictly eliminating instances of acceptance of defective blocks;

Implementing immediate measures to create proper conditions for construction workers labor and recreation, to recruit more staff and keep them in construction organization, and to ensure that vocational and technical schools training construction cadres are fully staffed;

Paying special attention to the need to strictly carry out the demands of housing legislation, to keep a correct record of citizens requiring better housing conditions and unswervingly observing the prescribed procedure for housing allocation, involving labor collectives and public organizations in this;

Fundamental improving work on examining citizens' complaints and requests on housing questions, relying more on the assistance of deputies and the public, and reacting in a prompt and principled manner to any instance of formal treatment or indifference to such requests;

Promoting more actively the development of house building cooperatives, the expansion of private construction, and improvement of the standard of amenities in private housing;

Adopting effective measures to ensure the maintenance of the housing stock, and to improve amenities in apartment blocks and their management. Stepping up work with the population in instilling a solicitous attitude toward the housing stock, and offering the population wider housing repair services.

Within 3 months the Tula Oblispolkom, in conjunction with the relevant ministries and organizations, is to establish the procedure for the planned transfer of the departmental housing stock to local soviets.

The RSFSR Council of Ministers and USSR ministries and departments with housing in the Tula Oblast are recommended to join with the oblispolkom in examining questions pertaining to give the oblast the requisite assistance to improve the technical standard of construction industry enterprises, improving construction workers' labor and everyday living conditions, giving villages a gas supply, providing villages with the requisite utilities and consumer services, and strengthening their material and technical base.

The attention of the USSR Ministry of the Coal Industry and USSR Ministry of Industrial Construction and their colleagues was drawn to the unsatisfactory fulfillment of party and government decisions in the question of improving housing and everyday living conditions for coal industry workers in Tula Oblast. The aforementioned ministries are obliged to adopt additional measures to overcome the lag and ensure without fail the fulfillment of their targets on the construction of apartment blocks and social and consumer facilities.

The materials received by the USSR Supreme Soviet on this question have been sent to the USSR Council of Ministers for consideration and the adoption of the relevant measures.

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CONSTRUCTION MACHINERY AND EQUIPMENT

LOW PRODUCTIVITY DUE TO UNDERUTILIZATION OF MACHINERY

Tashkent KOMMUNIST UZBEKISTANA in Russian No 5, May 85 pp 65-73

[Article by E. Makhmudov, candidate of economic sciences, under the rubric "Social and Economic Problems of Developed Socialism": "Raising Labor Productivity -- the Builder's Key Task"]

[Text] The Communist Party and Soviet Government have identified the increase of labor productivity at all stages of economic construction as the most important of many social and economic tasks to be accomplished. V. I. Lenin pointed out that "labor productivity, in the final analysis, is the primary, most important element for the victory of the new social order" (POLNOYE SOBRANIYE SOCHINENIY, Vol 39, p 21).

The large-scale nature and high dynamism of contemporary economics raises the significance of growth in labor productivity -- the main source of expanded socialist reproduction and accumulation, and an indispensable condition for transferring the economy to an intensive path -- to a qualitatively new level. As was emphasized by General Secretary of the CPSU Central Committee Comrade M. S. Gorbachev in a speech at the March (1985) Plenum of the CPSU Central Committee: "We should and must assume in a short time the most advanced scientific and technical positions and the highest world level of social labor productivity."

In the 11th Five-Year Plan, a growth of no less than 85-90 percent in and a total increase $\frac{100 \text{ percent}}{100}$ in construction and installation work are projected as the result of an increase in labor productivity. During the five years, labor productivity in construction is to increase by 15-17 percent as compared with 11 percent in 1976-1980.

The improvement of efficiency in construction is tied in with revealing sector and regional potentials and utilizing them to the maximum. This was a focus of the 25th CPSU Congress, which stipulated increasing the contribution of every union republic to the accomplishment of tasks that concern the nation as a whole; this is promoted by an overall unity in the USSR national economy, in which interests in the economic development of the country and every union republic are organically combined and all-union and regional investment policies are successfully interwoven.

Uzbek SSR is one of the few republics where the planned rate of capital investment growth (according to the targets of the current five-year plan) is noticeably higher than the all-union indicators, where there are not only favorable natural and climatic conditions for introducing large-scale and fast-paced capital construction, but also a solid material and technical base. At present in Uzbekistan there are in operation more than 2 thousand state and inter-farm construction and installation organizations and design and survey establishments working under contract, more than 220 enterprises of the construction materials industry and a number of large construction-installation and special-purpose production associations. There are more than 10 thousand excavators available for use by builders, more than 13 thousand bulldozers and scrapers, about 7 thousand traveling cranes, 290 hydraulic dredges and much other equipment. Nowadays a large construction trust (association) has several times more machinery than there was in the republic's whole building industry in the 1940's and 1950's.

The implementation of plans for increasing and improving industrial production and improving the housing and living conditions of the people are directly tied in with capital construction, its scope and successes. The most important role in opening up new lands, increasing the cultivation area for all kinds of agricultural crops, especially cotton, and implementing the Food and Energy Program within the region belongs to this industry. On the whole, the further development of productive forces, the improvement of the national-economy structure and the strengthening of the whole economy depend on construction. Therefore the Central Committee of the Uzbek Communist Party and the government of the republic are devoting unremitting attention to this industry and are adopting measures for raising the efficiency of construction and the capital investments used in this sphere. These questions are reflected on an all-union scale in the decree of the CPSU Central Committee and Council of Ministers, "On Improving the Planning, Organization and Administration of Capital Construction" (May 1984), and also in other party and governmental decisions.

Certain successes have been achieved in the capital construction of Uzbekistan thanks to a significant growth of production potential in the building industry. At the beginning of the 1960's the total volume of exploited capital investments hardly amounted to 2 billion rubles, while now annual investments alone exceed 6 billion rubles. In 1981-83 almost 18 billion rubles were utilized, approximately as many as in the years 1924-1965.

A great deal was accomplished by builders last year, the year of our republic's anniversary. Among the projects put into service were about 20 new large industrial enterprises, a second subway line, more than 90 thousand hectares of new irrigated land, livestock breeding facilities, mechanized farms and complexes for keeping livestock and poultry with over 100 thousand places, and a large number of well-built apartments, schools, hospitals and children's institutions. As a result of the new construction, and expansion and reconstruction of existing enterprises, electric power capacities and the capacities of the chemical and petrochemical industry, of engineering and metal working, and also of sectors in the agro-industrial complex have grown considerably.

In brief, as in other industries, construction shows positive results and a shift to the better has been observed. However, on the whole far from everything in this industry is satisfactory. From year to year builders have failed to meet goals for putting projects and capacities into operation by prescribed deadlines. The amount of time spent in installing some of them has been considerably greater than the norm, for which reason the national economy and population have suffered considerable losses. In a number of sectors, the above-norm volume of uncompleted construction projects is considerable, and the amount of work on reconstruction and technical re-equipping of production is insufficient.

As was noted at the 16th Plenum of the CPUz Central Committee (June 1984), "construction ministries are not adopting effective measures for eliminating shortcomings and improving the management of the industry." The plenum's indications -- that in a number of sectors there has been a fall in investment returns, profitability and labor productivity and that the output quality remains low -- have a direct relation to construction as well.

Thus, in the 9th Five-Year Plan the average annual labor productivity growth in Uzbekistan construction amounted to a little over 6 percent, while in the 10th Five-Year Plan this indicator has not climbed above 2.8 percent. In 1980-82, labor productivity here grew a total of 5 percent. In 1983 the situation did not basically change; the annual quota for labor productivity in state organizations doing construction and installation work under contract was fulfilled only by 97.5 percent (organizations under national jurisdiction -- by 97.6 percent, and republic organizations -- 97.2 percent). The portion of work volume growth (estimated value) due to raising labor productivity amounted to 15 percent instead of the 89 percent stipulated in the annual plan. Nor does an analysis of the implementation of the 1984 labor productivity plan for construction create a bright picture: the majority of local construction subdivisions are not "making it" to the planned level, while among those who have overfulfilled the plan there are several who achieve the full increment of labor growth primarily because of an increase in the number of workers.

But how do Uzbekistan builders utilize the fixed production capital reserved for them, the total value of which amounts to several billion rubles? Unfortunately, matters are not going as well as might be desired in this area either. From 1970 through 1983 the capital-labor ratio in construction increased by a factor of over 2.6 and labor productivity by a factor of 1.6, while from 1975 through 1983 the increases were by a factor of 1.9 and a little over 20 percent, respectively. These figures tell us that the growing stock of highly productive, low-cost machinery and equipment is still being used unsatisfactorily at many construction projects, with a low yield. Not everywhere and not in all situations are all the nuances of machinery and equipment use thought out from beginning to end or the size, tonnage and other parameters of building structures and loads made to correspond to the capacities of hoisting and transport equipment; not everywhere is the work of basic machines coordinated with the work and potentials of auxiliary or service equipment. The efficiency of machinery use, which amounts to approximately a half of the total cost of the fixed production capital for construction, is substantially deteriorating due to repair delays and stoppage when spare parts

are not available and must be waited for. For the reasons mentioned, basic construction machinery and equipment stand idle from 20 to 72 days during the year, according to data from the UzSSR TsSU [Central Statistical Administration].

All this, naturally, is shown on the level of investment returns, which fell in the industry from 2.9 rubles in 1970 to 2.06 rubles in 1980, or by 29 percent. In spite of the growth tendency outlined for it from 1981 on, it has fallen short of the level attained in the 9th and 10th five-year plans.

However the fall in investment returns is not regarded by all economists as coincident with the decrease in production efficiency and, consequently, the efficiency of the utilized means of labor. On the contrary, it is permissible to think that such a fall is natural during the period when production is being outlined with fixed assets, especially with costly individual or series equipment, as well as during major shifts in construction distribution and due to other circumstances. For example, the simplest logic tells us that the replacement of a shovel with an excavator will lead not only to an increase in labor productivity, but to a certain decrease (in cost) of capital and machinery yield.

Such a simplification hardly corresponds to the principles and conditions of socialist management. Now, when all sectors of the economy, including construction, are fitting themselves out with highly productive machinery and improved equipment, and when the capital-labor and machine-labor ratios for production and labor are growing with each year, the multi-purpose nature of capital-labor and capital-output ratio indicators and of labor productivity indicators not only contradicts the goal of transferring the heavy and labor-intensive work to the "shoulders" of machinery and equipment (and on the whole contradicts the course of scientific and technical progress), but also fails to promote the intensification of production and improvement of its efficiency. Therefore the decrease in capital yield should be perceived, from our point of view, as a negative element in management practice and, conversely, its overall increase should be perceived as a very important reserve of labor productivity growth and increase in the volume of productivity. It is surely not by chance that the party and government are making a connection between an improvement in the use of fixed capital and productive capacities, and an improvement in the efficiency of scientific-technical and productive potential and further economic growth. At the 26th CPSU Congress it was pointed out: "Improved use of productive capacities -- machinery, equipment and transport means -- are opening up great possibilities. Cutting down on idle time, raising the shift coefficient, establishing technical diagrams, saving energy and materials -- these are where efforts must be focused."

Economic calculations show that in the UzSSR an increase in capital yield in construction by only 1 kopeck will further additional production of construction and installation work by approximately 200-250 thousand rubles, and on the scale of the republic economy this would mean an increase in the volume of income by almost a half billion rubles. Even more significant is the economic gain from an increase in capital yield on the national scale: a mere 1

percent growth means a relative savings of capital investments in fixed productive capital of more than 6 billion rubles.

But these additions, realized on the level of both the industry and the national economy as a whole, do not materialize by themselves and do not come without certain efforts. Here we need a number of measures that embrace the technical, organizational and economic aspects of the formation and use of fixed production capital, especially its active part -- machinery and equipment and means of transport, with which the processes of mechanization and supplanting hand labor in construction are connected.

It appears that we should start by raising the status of capital yield indicators, which are now used for the most part in statistical and analytical calculations, and not on all organizational levels of construction management or in all construction subdivisions at that. The point in question concerns strengthening planning functions, making a preliminary determination of the normative capital supply for construction organizations and the size of the capital returns which would be placed at the basis of a rational correlation between production output and the expenditures of embodied labor, and in general the choice of capital and labor-saving directions in the development of capital construction. By the way, this point is focused on in "The Methodological Indications for Elaborating State Plans for Economic and Social Development in the USSR," confirmed by USSR Gosplan [State Planning Committee] in 1980 and widely practised in industrial enterprises. For now the efficiency of capital yield in construction is low, which may explain the cases of superfluous capital supply in some organizations and at the same time a shortage in others.

The following measure, with which the possibilities for raising capital yield and labor productivity in construction are connected, is to improve decisively the use of the machinery stock. Without this, one cannot rely on having an overall mechanization of construction and installation work, an elimination of heavy manual labor and a better pace in construction work. First, we need to raise the shift coefficient for equipment operation when it does not correspond to today's needs. We must ensure a fuller capacity load for each machine and each integrated set of machinery, which is required both by the scale and the industrial nature of modern construction. We cannot lose sight of the fact that when machinery and equipment stand idle and when they are not used to capacity it is not only expensive but narrows the possibilities of developing the growth and mechanization of labor productivity and slows down the pace of capital construction.

This measure, obviously, should be strengthened through an increased responsibility among executives of construction ministries, departments and other organizations for the use of machinery stock, the fulfillment of quotas for increasing labor productivity, for lowering output production costs and for improving other production indicators on account of mechanization. Special concern should be shown in cases where the volume of work done by hand in the republic shows a decrease and yet in a number of organizations this indicator increases. It should be considered abnormal when the work of construction and installation organizations working under contract do not fulfill planned and

supplementary quotas for raising labor productivity as a result of overall mechanization. And unfortunately there are quite a few such cases. In the UzSSR Ministry of Construction system, for example, the plan on labor productivity growth through mechanization of work was not fulfilled by 10 trusts in 1981, 11 trusts in 1982 and 12 in 1983.

The insufficient level of planning mechanization, its weak basis and poor coordination with concrete production situations and with the whole course of scientific and technical progress in construction call attention to themselves. Thus, if you judge by the data of the Uzbekmetallurgstroy Trust, you might suppose that it would be more advantageous to use manual labor than technology. Here, 1.74 percent was allocated in the 1981 plan for mechanization as a factor in increasing labor productivity, 0.07 percent in 1982, and even less in the 1983 plan -- 0.02 percent. Naturally, when preference is not given to technology and production mechanization, the share of manual labor grows. In 1983 the number of employees for every 1 million rubles of construction and installation work carried out by the Uzbekmetallurgstroy Trust using its own forces amounted to 215 persons, while for the rest of the construction trusts in the republic this indicator fluctuated between 59 and 188 persons. (The national average was approximately 75 persons per 1 million rubles of completed construction and installation work.)

Citing the indicators for the Uzbekmetallurgstroy Trust in no way means that it particularly "stands out." The same phenomenon can be seen, unfortunately, in other organizations as well, and not only in the system of the UzSSR Ministry of Construction. This case and similar ones testify that the growth of labor productivity, the increase in capital yield and the mechanization of building production can remain only good intentions if the pertinent problems are not resolved in the stage of planning, if each point of growth for the indicators we have mentioned is not carefully substantiated. This truth, which requires no special proofs, should always be remembered when speaking about increasing the efficiency of production.

Often the opinion is expressed that low growth rates for labor productivity in construction are the consequences of an insufficient level of scientific and technical development and a lack of the necessary machinery, equipment, instruments and apparatuses. Actually, it would be incorrect to deny this. However, as was pointed out above, the technology and fixed production capital that the builders already have at their disposal are being put to insufficient use. Besides that, the builders themselves display an inertia in this area; they are not fully mobilizing their potential and, importantly, are not fulfilling the planned measures for scientific and technical development. For instance, during the last five years not once was a plan for introducing progressive methods of construction fully realized in the industry. And such methods are an aspect of scientific and technical progress that is meant to ensure the growth of labor productivity and the increase in the industry's efficiency, just as are improving the utilization of machinery stock, improving construction technology and introducing advanced production experience.

Construction, like any other kind of production, cannot carry out its business

without materials, raw materials, structures and other products referred to in theory and practise as the management of working capital. In the actual production costs of construction and installation work these amount to almost 50 percent, and their total value, invested in stocks of material and commodity assets, is approximately equal to the value of the fixed production capital used by builders.

Technical progress and improvement in building production have substantially changed the nature of the output and use of construction materials and structures; their variety has increased, their industrial character and plant readiness have grown and their quality has improved. At the same time production expenditures have changed. Nowadays the output of every unit, ton and cubic meter of such materials and structures has concentrated in it enormous expenditures of not only live but also embodied labor. Therefore the best use of construction materials and products and every way of saving and preserving them have no less significance for the growth of labor productivity than raising the return of fixed production capital. Moreover, with capital construction expanding in scale, this becomes an immutable law of zealous management and growth in production efficiency.

However one cannot look at this question with the eyes of the builder alone. A national-economy approach to it requires consideration of two circumstances: first, the improvement of quality in construction materials and structures while still in the production stage and a guarantee that sets of them will be complete, and second, the improvement of design planning. In practise the second circumstance even prevails over the first, inasmuch as models of future projects are incorporated in the design plans, just as are the materials, structures, mechanization means, and finally the methods of production organization essential for their construction. Therefore the qualitative level of design plans and their progressive and economical nature promote the achievement not only of architectural and planning expressivity but of an improvement in efficiency as well.

From the foregoing it is clear that the improvement of the use of construction materials, structures and products is a task of state importance, relating to all the participants in the investment process: enterprises directly producing these materials and structures, builders who use them in "business," designers, and supply and transport organs who ensure the preservation, coordination and timely delivery of materials to the construction site. Only a harmonious coordination in their activities leads to the desired result. In the opposite situation, the efficiency achieved in one link of the "construction assembly line" may come to naught in another of its links, and the importance of the gains will be far from matching the losses.

A similar national-economy approach is required by questions of organizing building production. The fact is that one or another subdivision of the industry, or the industry as a whole, can have the required tools and objects of labor and a contingent of workers; however the careless distribution and assignment of these things, and their utilization on a "hit and miss" principle, slows down construction's increase in efficiency. Precisely because of weak labor and production organization, nonproductive losses and defective

outputs have been permitted and penalties paid. Meanwhile building production has at its disposal enough normative documents and recommendations, meant to "coordinate" the execution of various kinds of work in time and space, to conduct construction on a scientific basis.

The level and rates of growth for labor productivity in construction are directly dependent on the use of work time. K. Marx already mentioned that "for society, as for the separate individual, the thoroughness of its development, use and activity depends on saving time... Thus the economy of time, just like the planned distribution of work time in various sectors of production, remains the first economic law at the base of collective production" (K. Marx and F. Engels, SOCHINENIYA, Vol 46, Part 1, pp 116-117).

Unfortunately the nature of building production (work in the open air, a changing place of work and other conditions) does not favor efficient use of time -- that invaluable and irreplaceable social wealth. Insufficient regulation of labor processes and sometimes a low level of discipline are impediments. It is no secret that in construction "smoking breaks" are frequent, checking on people leaving work for lunch and returning from it is haphazard, and too much time is spent "trying on," "making adjustments," and "thinking over" -- things that are totally unacceptable, let us say, in blast furnace or flow line production. A certain loss is suffered due to the turnover of personnel, the unjustified transfer of people and technology from one project to another, etc.

There are many ways of eliminating these losses, and they are known to every builder -- from worker to minister. However if you try to reduce them to one, main direction, you get the following: proceeding from the fact that the majority of economic losses, including work time, are tied in with the activity of a person (the results of his poor work discipline or insufficient experience, qualifications, organizing capability, etc.), one may assume that the elimination, or rather anticipation, of them is likewise tied in with the activity of a person -- but one endowed with good will, responsibility, initiative and a sense of enterprise for the good of the state. When they possess these and other positive qualities, people can achieve highly productive labor in all sections of production.

Finally, we must talk about one more possibility for ensuring growth in labor productivity -- expanding the use of the brigade contract in construction. However for this it is precisely those human qualities we just mentioned that are needed, primarily initiative and persistence both for construction site managers and for the brigade-member workers themselves.

Clearly it is superfluous to talk about what a brigade contract gives, what the builders united in self-financing (cost-accounting) brigades strive for, how much the wages of each member of such a brigade grow, etc. In the press there has been fairly extensive information in this regard (e.g. KOMMUNIST UZBEKISTANA, No 6, 1984). One can only say that the functioning of self-financing brigades makes it possible for us to save the labor of 12 people for every 1 million rubles of building and installation work. In such brigades many of the members, as a rule, have two or three related sets of skills, and

some of them take courses in tekhnikums or institutions of higher education; the responsibility in these brigades for the assigned work and final production results is high. For example, the activities of self-financing brigades led by Heros of Socialist Labor M. Dovbnya (Khorezmvodstroy Trust) and I. Khabibov (UzSSR Ministry of Construction Trust No 10), and also A. Zborivets and S. Rakhmanov (Uzbekshakhtostroy Trust) and M. Khabibullaev (Vysotstroy Trust No 11) are known in the republic and beyond its borders.

On the whole, the brigade contract needs no recommendations; its efficiency has been proven in many sectors of the national economy, including in construction itself. However it is being introduced by construction organizations too slowly and not with complete success in every case. Often the self-financing brigades are formed without a sufficient basis and their makeup turns out to be random. Because of shortcomings in the planning and organization of brigade work, many of them do not show high production results; moreover they curtail their activity without waiting until the end of the year and thus do not fulfil their accepted obligations. For these and other reasons, the share of self-financing brigades in the total number of construction brigades functioning in the system of individual construction ministries and departments of the republic, fluctuates between 38 and 50 percent, while the work volume carried out by them corresponds to 42.5-60.1 percent.

The introduction of the brigade contract cannot be regarded as an end in itself and cultivated artificially. Attempts to establish self-financing brigades by declaration, to "squeeze" them into the existing structure of production management without preparatory work, do not yield positive results -- this only inflicts damage on the idea itself. Therefore it is very important to observe those measures specified in the Decree on Introducing Brigade Cost-Accounting in Construction, especially the section connected with supplying the brigade with the necessary material and technical resources.

The expansion and increase in efficiency of brigade (self-financing) forms of labor organization would promote an improved system of accounting and reporting, a timely evaluation of the results of brigade work and wide publicity for them. Such a measure may require the strengthening of the economic services of construction organizations, the establishment of people in charge, and a re-evaluation of the system of economic incentives, but it will ensure the efficiency of brigade self-financing as a method of self-management, will eliminate unsystematic "campaign" efforts in this matter and give it a firmer and more permanent character.

The growth of efficiency in the brigade form of labor organization is promoted by a strict allocation of self-financing brigades to projects, a determination of their period of stay and the sequence of their work there, and also the presence of brigade activity schedules from project to project in the course of a year. Therefore it would be advantageous to equip self-financing brigades with prospective plans, calculated for two- and five-year periods, after turning over the task of working these plans out to the economic services. This measure, which is like a continuation of the preceding one, coordinates brigade and management (trust) profit and loss accounting as a single unit, and establishes a general interest in raising the efficiency of production in

construction.

Labor productivity is an important economic indicator in the life of every productive collective. In it, as if in a focus, are reflected many aspects of the organizing and planning of production and of its assimilation of the achievements of scientific and technical progress. The growth of this indicator is simultaneously a cause and a consequence of the setting and successful implementation of social and economic goals, both local and pertaining to the economy as a whole.

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MODERNIZED TRACTOR PLANT RAISES OUTPUT, QUALITY

Moscow MASHINOSTROITEL in Russian No 12, Dec 84 pp 30-31

[Article by B. S. Zlobin: "Unification Is the Path for the Growth of Output of Machines"]

[Text] In 1981 the Tallin Talleks Production Association imeni 50 Letiya SSSR was instructed to master the series production of two new excavators of a capacity of 103 to 118 kw: the ETTs-206 drain-laying excavator on the basis of the swamp modification of the T-130 tractor for drainage construction on frozen and solid ground and the ETTs-208D excavator for trench digging on frozen ground during gas and petroleum pipeline construction on the basis of the industrial modification of the same tractor. Then the production of ETTs-208A excavators was transferred to the association from the Kharkov Excavator Plant.

The mastering of the production of new machines set the task of urgently carrying out their design and technological unification for the association's collective. Such work was carried out in a short time owing to the fact that the collective constantly paid much attention to unification and accumulated definite experience in this direction. For example, most structural elements, that is, threads, shaft and opening diameters, gear modules, bending radiuses, grooves, structural elements of forks and levers, tolerances and fits, cutting tools, hydraulic parts, elastic and rubber rings and so forth, were unified. The manufactured machines and technological processes were unified, the group method of machining parts was introduced widely and so forth. The module container system, consisting basically of four modules for the transportation of large parts and units and three modules for the transportation of smaller parts, was developed and introduced into production.

At the initial stage of work on the unification of excavators on the basis of the T-130 tractor it was established that the following differed in them: the width of the operating element, operating chains, hydraulic systems, drives, control systems, conveyers and some other units, as well as structural elements and materials. ETTs-208D, ETTs-208V and ETTs-206 excavators in the weight and dimensions of parts, gear design, technological equipment, transport and lifting facilities and the necessary number of production areas are the representatives of a heavier category of excavators than those manufactured before them.

Therefore, the mastering of the production of the first series of new excavators required 2,200 to 3,000 square meters of additional production areas for the assembly and installation of special equipment for the machining of base members and pinions of splined joints and the organization of working places for body-welding units (body, operating element and so forth). The list and number of standardized and special tools increased significantly, which required the creation of new capacities for the tool stock. The need to manufacture additional original parts of 1,425 items at existing production sections required an intensification of the control, planning and additional preparation of production and an increase in expenditures of engineering support.

In connection with the fact that new excavators were manufactured in limited series it was economically unprofitable to utilize progressive billets (for example, stamped instead of forged) and equipment (automatic and semiautomatic machine tools and new technological processes). The proportion of work at universal lathes increased. All this indicated that the output of new excavators on the basis of T-130 tractors was possible only after an all-around unification of their basic units and parts.

The association's collective approached the accomplishment of the task set for it with a special responsibility. The association's party organization took the entire work on the organization of production and a prompt output of new excavators under its unabated control. A special staff for a better coordination of this work was created. It was headed by the enterprise's chief engineer. The staff informed the party committee of the state of affairs no more rarely than once a month. Similar staffs were also created at some sections and at the association's affiliate. Extensive means of mass propaganda, that is, workers' meetings, the wall press and classes in the system of party training and economic education, were utilized for the mobilization of all workers for the fulfillment of the task set. For the purpose of training engineering and technical personnel and cadres of workers for the output of new products courses for improvement in skills, whose program envisaged the study of new machines, were organized. In 1983 personnel retraining was entrusted to the plant's vocational and technical school.

The extensive work carried out by the collective was based on the following principles: During the unification of several machines, at the same time, it is advisable to proceed (all things being equal) from the design solutions of a machine of the largest series and the simplest design, taking it as the basic one, and to gradually change over to more complex designs by adding the necessary supplementary elements to the basic one. For example, the hydraulic system of the ETTs-208D excavator was chosen as the basic one, but for the ETTs-208V excavator the hydraulic drive of a conveyer with the installation of an additional hydraulic pump was added to it and for the ETTs-206 drain-laying excavator, an electrohydraulic follow-up system and an additional hydraulic cylinder. During the output of several similar machines with different design solutions of the same unit the only possible variant was chosen and extended to other machines, even if it proved to be more complicated and expensive than necessary for them.

The enterprise's designers and process engineers worked with great intensity, striving for the optimum solution of problems. Process engineers aimed for a revision of the tolerances of billets made by smith forging toward a reduction. Tolerances were lowered in the billets of more than 50 percent of the parts. This gave a significant saving of metal and labor resources. For example, previously the chain bush of the operating element of the ETTs-208D excavator was made from a billet 75 mm in diameter. The drilling of an opening in a billet was entrusted only to a skilled worker. Process engineers suggested that designers unify this bush with the chain roller of the operating element of the ETTs-165 machine and make it from other steel that could be worked on a multispindle horizontal automatic machine. As a result, the labor intensiveness of manufacture of this bush was reduced several times and the skilled machine tool operator was freed conditionally.

As a result, the unification was carried out in a short period and production plans were fulfilled at the scheduled time. At the same time, such major units complex in manufacture as the gearhead of the operating element, hydraulic system, control and counterweight, as well as small units and parts, fastening elements, mechanical rubber goods and structural elements of parts (stamped openings, radiuses of curvatures, chamfers, grooves and so forth), were unified. In addition to this, in ETTs-208B and ETTs-206 excavators the conveyor, operating element and its chain were unified. Pipelaying equipment, the electrohydraulic follow-up system and elements of the hydraulic system of the ETTs-206 drain laying excavator and of the serially manufactured ETTs-202A drain laying excavator were unified.

The unification of excavators of the new family made it possible:

To increase the coefficient of mutual interproject unification from 45.1 to 80 percent;

to raise the level of unification for individual machines, which is indicated by the rise in the coefficient of applicability: from 45.7 to 67.6 percent for the ETTs-208D; from 49.4 to 82.3 percent for the ETTs-208V; from 51.4 to 70.8 percent for the ETTs-206;

to lower the number of type sizes of units and parts, for which it was necessary to form technology and to manufacture equipment, by 604 units, which conditionally freed 103 workers and 14 members of the engineering and technical personnel;

to reduce the volume of elaboration, storage, reproduction and circulation of technical documents;

to simplify the control of parts and units in production;

to raise the series output of parts;

to increase the degree of production equipment;

to increase the possibility of group machining of parts;

to shorten the list of applied materials;

to reduce the list of spare parts.

The economic effect totaled 400,800 rubles.

The unification accelerated the mastering of new equipment without a reduction in the rates of production of serially manufactured machines. At the same time, during the year following the unification, on the average, the labor intensiveness of manufacture of ETTs-208D, ETTs-208V and ETTs-206 excavators was reduced by 10.4 percent. Owing to this, the output of machines increased sixfold in a short time without the commissioning of additional production capacities. Furthermore, the technical level of production improved, that is, the coefficients of utilization of advanced equipment, of the shift operation of industrial equipment as a whole and of metal utilization, as well as the level of mechanization of basic and auxiliary operations, rose and the production cost of machines decreased. As a result of the unification, the time for the technological preparation was shortened to two-thirds or one-half.

The association's collective fulfilled the 1983 plan for all basic indicators. Output was sold 102.8 percent in excess of the plan. The collective also made good advances in 1984. The 9-month plan for the sale of output was fulfilled 102.8 percent and for labor productivity growth, 101.3 percent.

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CONSTRUCTION MACHINERY AND EQUIPMENT

BRIEFS

HYDRAULIC SUPERPOWER EXCAVATOR--This single-design machine was created by the labor of very many people and the cooperation of scientists and engineers at the Ural Scientific Research Institute of Heavy Machine Building and the collective of the Ural Heavy Machine Building Plant. It passed plant tests successfully. The weight of the EG-20 (this is the name of this machine) is 450 tons lower than that of its predecessors. However, the excavator bucket holds 20 cubic meters. At the same time, the EG-20 is more maneuverable and efficient than heavier machines. The Ural Heavy Machine Building Plant, that is, the Uralmash, which is known to the entire country, is called the flagship of the Soviet heavy industry for a reason. Rolling mills, multitonn units of blast furnaces, equipment for sinking deep and ultradeep wells and giant excavators originate at the shops of the Uralmash. One of the enterprise's latest innovations is connected with the production of excavators. Of course, superexcavators, whose bucket capacity reaches 100 cubic meters, are manufactured at the Uralmash. They are walking draglines. As yet, however, engineers have not decided on the construction of a machine capable of removing 20 cubic meters of rock in one operation, basing its power circuit entirely on hydraulics. The EG-20 has justified hopes. The machine has turned out to be not only more efficient, but it is also more convenient and pleasant to work on it. Owing to the boom's smooth movement, the giant can perform fine operations. The new machine is a notable contribution of Ural's machine builders to the development of scientific and technical progress, which is the basis for the further development of the country's economy. In the future they envisage the construction of the first walking hydraulic excavators. [Text] [Moscow IZVESTIYA in Russian 21 Jul 85 p 1] 11439

CSO: 1821/019

CONSTRUCTION METHODS AND MATERIALS

UDC 666.965.2

OUTPUT DATA; AVAILABLE MIX OF CONCRETE PRODUCTS VIEWED

Moscow STROITELNYYE MATERIALY in Russian No 2, Feb 85 p 26

[Article: "In USSR Minstroyaterialov's Scientific and Technical Council"]

[Text] The conference of the Wall-Materials Industry Section of USSR Minstroyaterialov [Ministry of Construction Materials Industry] met in Tallin. The main areas of scientific and technical progress in the production of autoclaved building materials were discussed.

Three types of autoclaved building materials are now being produced: silicate-concrete articles of cellular and solid structure, and silicate brick. In 1983, 96 enterprises that make autoclaved silicate concretes produced 5,998,800 m³ of output, including 466,500 m³ of solid concrete. More than 190 plants made 14.9 billion standard-equivalent bricks in the form of silicate brick and stone, including 1.75 billion hollow bricks of 10.5 percent average hollowness and 860 million hollow blocks with an average hollowness of 22.7 percent, and 1.21 billion facing bricks. The average density of the brick was 130.1 kg/cm².

Of the 5,532,300 m³ of hollow concrete, 1,594,900 m³ were hollow-concrete panels, including 1,270,700 m³ of wall panels with an average density of 695 kg/m³, 2,237,000 m³ of wall block, including small blocks with an average density of 670 kg/m³, and 1,675,000 m³ of thermal-insulation slab.

In the last decade the output of small wall blocks increased 2-fold, silicate brick 1.2-fold.

Production was increased by the construction of new plants, the reequipping of existing plants, and the introduction of scientific and technical developments.

In producing articles made of hollow concrete, wide use is made of cutting technology, the impact-forming method, new types of finishing work, compounds for the anticorrosion protection of reinforcement, reactors for the continuous quenching of silicate mix, and so on.

Industrial lines for making small wall blocks out of hollow concrete are to be built. It is planned to increase the output of products made of grade 35 hollow concretes with a bulk density of 600 kg/m³ and, in the long term, hollow concrete of 25-35 grade and 500 kg/m³ bulk density. In order to

further industrialize construction, the output of large products is to be increased, and the degree of factory preparation of articles is to rise.

Research has started on the molding of products made of hollow concrete with a bulk density of 500 kg/m^3 , including massive units up to 180 cm in height.

A complex of discrete batching equipment, a mixer for manufacturing highly viscous mixes, new technology and equipment for molding massive units, methods for cutting massive units of reduced plastic strength, equipment for utilizing wastes from the cutting of massive units, and a general-purpose gas generator are being developed.

Moreover, industrialized constructional structure made of hollow concrete, including built-up panels fully readied at the factory and the technology and equipment for manufacturing them, and new types of finishing work for articles with shutters will be created. A special conveyor line for making wall blocks is being developed.

The output of silicate brick and stone, including hollow units, is being greatly increased. Scientific research has been aimed at the output of thermally effective and hollow products for making silicate brick. Questions of the receipt of raw materials and the preparation of the mix are being resolved, work on the making of SM-1085 I02 and I07 presses is being completed, a new hydraulic press is being created, and so on. Equipment is being developed for the containerization and packaging of articles made of hollow concrete and silicate brick.

The technology and equipment for producing large articles from solid silicate concrete on automated conveyor lines have been created. A full set of load-bearing inner walls and ceiling-floor panels for serially-built housing and nonindustrial buildings of various numbers of stories and purposes can be manufactured on one line. Production has been automated and completely mechanized, and output per worker is 373 m^3 .

In recent years the technology has been developed and an experimental line has been created for producing a new building material--extruded asbestos silicate, from which a wide range of load-bearing and enclosure structure can be manufactured for buildings of various types. This technology will permit the materials intensiveness of production to be reduced considerably and maximum use to be made of finely dispersed industrial waste and other substandard materials.

the main directions of scientific and technical progress in the area of autoclaved building materials include the following:

--make more complete use of industrial waste material to produce articles made of autoclaved concretes;

--further increase the production of articles made of hollow concretes, primarily of higher quality (a density of 500 kg/m^3 , grade 30-35), using progressive cutting technology, and also expand the use of impact molding;

--develop and master the technology of hollow concretes with height of massive units of up to 1.8 meters in height;

- build new plants for making silicate brick and reequip existing plants;
- further increase the production of efficient lightweight silicate brick, using the experience of advanced enterprises;
- expand the production of large items made of solid silicate concrete based upon automated production lines; and
- organize the production of articles made of autoclaved concretes by the extrusion method, primarily by using secondary industrial output and fine sand.

In order to resolve the tasks assigned, the section recommends: NIPIsilikat-beton [Scientific-Research and Design Institute for Silicate Concrete Products] and VNIItrom [All-Union Scientific-Research Institute for Building Materials and Constructional Structure]: Prepare recommendations for solving the basic scientific and technical problems of producing hollow concrete, solid silicate concrete and silicate brick during the 12th Five-Year Plan.

Request that the Administration of the Wall and Heat-Insulating Materials Industry and USSR Ministry of Building Materials' Glavremmekh [Main Administration for Machinery Repair] solve the problem of series manufacture by Ministry of Construction, Road and Municipal Machine Building] and Glavremmekh of equipment developed for producing articles made of hollow concrete.

The Minsk Branch of VIASM [All-Union Scientific-Research and Design-Development Institute for the Automation of Building-Materials Industry Enterprises]: Concentrate efforts, jointly with industry institutes, for developing integrated automated systems for controlling the production of autoclave-solidified constructional articles.

Request that Glavniiprojekt [Main Administration for Scientific-Research and Design Organizations] and the Administration for Wall and Heat-Insulating Materials Industry stipulate that design-organization plans include development of the following designs:

- a standard design for producing articles made of small-thickness hollow concrete for the support of agricultural construction. In so doing, specify the potential for manufacturing large wall blocks that can provide for a greater degree of industrialization of construction than can small blocks and silicate brick; and

- a design for an integrated enterprise for making a full set of load-bearing articles of solid concrete and enclosure structure made from autoclaved hollow concrete, for housing and nonindustrial construction.

VNIIESM [All-Union Scientific-Research Institute for Scientific and Technical Information and Economics of the Building-Materials Industry]: Develop measures for improving material incentives for producing articles made of autoclaved concretes, especially with the use of secondary industrial products.

Administration of Wall and Heat-Insulating Materials Industry: Extend every assistance, jointly with scientific-research and design institutes, to introduction of the results of scientific-research into production most rapidly.

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CONSTRUCTION METHODS AND MATERIALS

GLASS PIPING AWAITS WIDE APPLICATION IN BUILDING CONSTRUCTION

Moscow EKONOMICHESKAYA GAZETA in Russian No 25, Jun 85 p 6

[Article by engineer N. Larina: "A Dependable Substitute for Steel"]

[Text] Glass piping has three times the life and is four times cheaper than piping made from high quality metal. Specialists feel that its production must be increased.

Can glass compete with steel? Yes, it can. Specialists have long been persuaded of this, both those who build and those who operate installations made from glass.

Despite its brittleness, this transparent alloy has been found to be a worthy rival of metal. Let us compare. Piping made from carbon steel remains serviceable for an average of 4 years, plastic piping lasts 6 years, and stainless steel piping lasts 8. But glass pipelines last 25 years and more!

One kilometer of glass piping saves 3.3 tons of stainless steel piping, 2.9 tons of carbon steel piping and 1 ton of nonferrous metals and alloys.

Glass is superior to metal in some of its properties. In many sectors of industry its high corrosion resistance, inertia, surface smoothness, life and hygienic properties are felt to be essential. Moreover glass can be cleaned easily, and it is relatively cheap.

The psychological barrier created by "glassophobia," which had hindered its introduction at one time, was overcome by enterprise directors. Today glass pipelines are operating at enterprises of 47 ministries and departments. Each year organizations of the Soyuzsteklomontazh Trust install glass pipelines in more than 2,000 installations.

Glass is valued for its hygienic properties by enterprises of meat-and-dairy and food industry. The transparency of the piping and its excellent capability for transmitting light make it possible to observe chemical processes. Introduction of glass piping is especially effective in galvanic production operations. After all, the toughest steel can withstand the effects of caustic media for but a year and a half. But glass, given compliance with the rules of its delivery, assembly and operation, is a practically "immortal" material. Glass is also widely used at machine building and instrument making enterprises,

and particularly at a number of the country's motor vehicle plants--AZLK [not further identified], Volga, Kama.

It is used in nonferrous and ferrous metallurgy in vitriol installations, in acid and etching departments and in cold-rolling mills, and to neutralize waste water.

Pneumatic transport systems made from glass piping are developing swiftly. They are being used successfully in textile, leather and fur production operations. During the 11th Five-Year Plan over 300 kilometers of pipelines intended for conveying such materials will be introduced.

Grain, flour and grist are carried to elevators by gravity-flow glass conveyers. Brine cooling batteries for storage of meat and dairy products, fruits and vegetables provide practical advantages.

In 4 years of the present five-year plan builders of the Soyuzsteklomontazh Trust installed 20,800 kilometers of glass piping, which made it possible to save 106,000 tons of metal, to include 74,000 tons of stainless steel and nonferrous alloys. The economic impact was 285 million rubles.

The sphere of application of glass will expand in the future as well. Owing to joint efforts by our country's scientists and their foreign associates, the problem of removing static electricity created when materials, especially free-flowing materials, are conveyed through glass piping, has been solved. As a result half a million rubles have been saved since the beginning of the 11th Five-Year Plan.

New domestically produced equipment has also recommended itself well. The Karmanovskaya GRES saved three trainloads of fuel oil per year when it introduced a glass low-temperature air heater. Boiler rooms in 30 of the country's electric power plants were reequipped in similar fashion, owing to which 2 million rubles were saved.

Today glass electrolyte preparation facilities are being introduced at all storage battery charging stations of the capital's automotive garages. The internal lines of the acid pipeline system of the Moscow Cardiological Center are made of glass.

Time itself is helping to reveal new ways to replace metal by glass. For example it will be used effectively in sewage systems at enterprises, where in view of various production processes liquid wastes are a caustic medium.

The demand for glass is naturally growing. Brand 13V glass piping has thus far been manufactured by two enterprises of the USSR Ministry of Construction Materials Industry: the Buchanskiy Glass Articles Plant, and mostly the Gomel Glass Plant imeni M. V. Lomonosov. The production process at these plants has long required renovation, and a building for production of piping out of borosilicate glass with a planned output of 3,750 kilometers was to be placed into operation at the Gomel Glass Plant by the end of the present year.

What is the situation today? Only the first generation of this facility is ready to be started up--that is, instead of the 3,750 kilometers of piping impatiently awaited by the USSR Ministry of Installation and Special Construction Work, only 825 kilometers could be obtained.

The general contractor--the USSR Ministry of Industrial Construction--was provided with the necessary plans and finances promptly. But it was in no hurry to assimilate the allocated capital investments.

But many interested ministries have planned their work with reliance upon the promised glass. Thus the USSR Ministry of Nonferrous Metallurgy approved a plan to replace metallic piping by glass. But how is it to be fulfilled now? And when will the new building at the Gomel plant finally go into operation? Only the USSR Ministry of Industrial Construction can answer this question.

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CONSTRUCTION METHODS AND MATERIALS

SLOW ACCEPTANCE OF ALKALI SLAG CEMENT NOTED

Moscow EKONOMICHESKAYA GAZETA in Russian No 37, Sep 85 p 9

[Article by Ya. Kryuchkov, chairman of oblast board of construction industry NTO [scientific-technical society], city of Chelyabinsk: "Concrete Without Cement"]

[Box insert] It can be made from blast-furnace slags. Just what is obstructing its introduction?

[Text] What explains the strength of rock such as granite, which surpasses the highest-strength concretes in strength? An answer to this question was received as a result of studies conducted at the Kiev Construction Engineering Institute under the direction of Doctor of Technical Sciences, Professor V. Glukhovskiy.

It turns out that solutions of alkaline metals are the universal "glue" which nature used to create minerals. What if a synthetic material is made with their help? The Institute developed a technology for obtaining concrete from ground blast-furnace slags and solutions of alkaline metal compounds.

The properties of this construction material are surprising! Ordinary concrete from Portland cement withstands a pressure of from 50 to 600 kg/cm² and alkali slag concrete withstands a pressure of from 300 to 1,600 kg.

It has higher water impermeability, low-temperature and corrosion resistance, and heat resistance. It is also important that substandard fillers are used in making it. The consumption of fuel and electrical energy for producing one ton of alkali slag concrete is 2½-3 times less than for a ton of ordinary concrete from cement. Standard equipment is suitable for making the mixture.

Today experience already has been gained in using alkali slag concrete at enterprises of the USSR Ministry of Construction of Heavy Industry Enterprises, the USSR Ministry of Industrial Construction, USSR Ministry of Land Reclamation and Water Resources, KaSSR Ministry of Agriculture, and Ukrmezhkolkhozstroy [Ukrainian Interkolkhoz Construction Organization]. Experience confirms its remarkable properties and high effectiveness. For example, use of the new material just in Ukrmezhkolkhozstroy permitted achieving an economic effect of more than R15 million. And the fact is that in the South Urals, where an

enormous quantity of blast-furnace slags of the Magnitogorsk and Chelyabinsk metallurgical combines has accumulated, life itself dictates the need to use them in the production of concrete.

It cannot be said that alkali slag concrete was not manufactured here at all earlier, but this was primarily in those instances where builders were experiencing a shortage of cement. In order to "make ends meet," they would make some certain kind of product out of alkali slag concrete. Of course, such work was in the nature of one-time orders.

But then three years ago the Main Administration for Construction in Central Urals Region established close contact with the Kiev Construction Engineering Institute. The Ukrainian specialists provided good help to the Urals builders and in the first half of 1983 units were installed on the basis of existing plants in the Chelyabmetallurgstroy Association and the Magnitostroy Trust. Later the very same units began to operate in the Uralavtostroy and Chelyabstroykonstruktsiya trusts. They can put out an overall total of 150,000 m³ of alkali slag concrete and structures made from it per year (three-fourths of the annual program of the USSR Ministry of Construction of Heavy Industry Enterprises). This is equivalent to the use of 60,000 tons of Portland cement.

Industrial assimilation of the alkali slag concrete helped the association reduce the amounts of unfinished construction. Work was suspended at a number of projects over a period of several years because of incomplete cement deliveries (especially in winter), as there were no foundation blocks. Now they arrive rhythmically.

It is possible to further expand the sphere of application of alkali slag concrete, including in housing projects, but this is not so simple. Planning institutes are unwilling to use the new material, referring to an absence of normative documentation. Planners presently are adhering to USSR Gosstroy recommendations entitled "Use of Concrete and Reinforced Concrete Structures and Articles made of Alkali Slag Concretes." The proposed products list and the area of its application are very limited. Suffice it to say that the recommendations give only 29 kinds of articles, while thousands of them are produced! These basically are very simple articles--curbs, fencing components...

A typical incident occurred in late July at the Magnitogorsk Metallurgical Combine. The construction complex of the oxygen conversion shop includes a six-kilometer concrete road. The Ministry of Transport Construction's Promtransniiprojekt [All-Union Planning and Scientific Research Institute of Industrial Transport] specified that the road was to be built out of traditional materials. Builders on the spot suggested using alkali slag concrete. Tests on 150 m of bed had been conducted in the past and in the first half of this year. The design strength was exceeded. The concrete withstood a load of 380 kg/cm² in place of the 350 kg in the plan. Reinforcement samples were cut from the concrete and they turned out to be like new and had not been subjected to corrosion in the least.

Can the road be built further? No, Promtransniiprojekt representative A. Kolganov, the Magnitogorsk Giprometz [State Union Institute for Planning Metallurgical Plants] (the general planner) representative I. Korobkin, and USSR Gosstroy NII zhelezobetona [Scientific Research Institute of Reinforced Concrete] representative S. Vysotskiy (he acted as arbitrator) decided to conduct tests on the next 150 m of bed, which will require another year...

Specialists of the Kiev Construction Engineering Institute were invited in. After familiarizing themselves with the problem, they supported the builders, especially as similar roads had been in operation for more than five years within the Ukrainian Interkolkhoz Construction Organization system and people had been convinced of their excellent qualities in practice. But the planners didn't change their opinion. The builders probably would have continued to work with ordinary concrete, but there was not enough of it. Road construction bogged down, but the fact is that it was to have been turned over for operation already by the end of the year!

This example shows once again how difficult it is for alkali slag concrete to be introduced. But it can be used in considerably greater volumes even with today's limited products list, although the capacities of Glavyuzhuralstroy only are loaded down by one-third in producing it, and here is why. The Magnitogorsk Cement Plant (the director is V. Kayurin) is supplying the builders with ground blast-furnace slag. Last year only 30 percent of the planned deliveries were received from here and for seven months of this year 7,500 of the 39,000 tons of slag were delivered. Repeated appeals to All-Union Stromsyrye Association Chief V. Pronin didn't correct the situation.

The riddle is simple to solve. It is unprofitable for the cement plant to put out ground blast-furnace slag now. The price of one ton of the slag is eight rubles, while that of a ton of cement is twice that. It is simpler to pay a miserly amount of fines for disrupting slag supplies.

It is obviously advisable to raise the price on ground slag to that of ordinary cement. An incentive for construction industry enterprises to produce this material also will promote the wider use of alkali slag concrete. As a matter of fact, the existing statute provides the payment of bonuses to builders above all, for thrifty consumption of cement, while its basic economy nevertheless is achieved at construction industry enterprises. It is a great pity that the introduction of alkali slag concrete is being obstructed because of organizational and bureaucratic confusion.

6904

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DESIGN FEATURES OF NEW MIRROR CONTROL TOWER SHOWN

Moscow MONTAZHNYYE I SPETSIALNYYE RABOTY V STROITELSTVE in Russian No 4, Apr 85 pp 12-13

[Article by V. S. Polukhin and F. D. Zhabin, engineers (Lipetskiy Section of VNIPIpromstalkonstruktsiya [All-Union Scientific and Research Institute for the Manufacture and Erection of Steel and Complicated Reinforced-Concrete Constructional Structure]) and A. I. Nikhamov, engineer (MU-26 [Installing Administration No 26] of Spetsstalkonstruktsiya [Special Trust for the Erection of Steel Structure and Bridges]): "Erection of a Tower for Vertical Control of Astromirrors"]

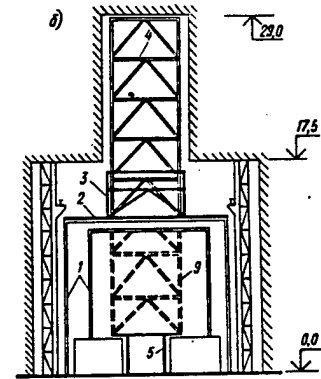
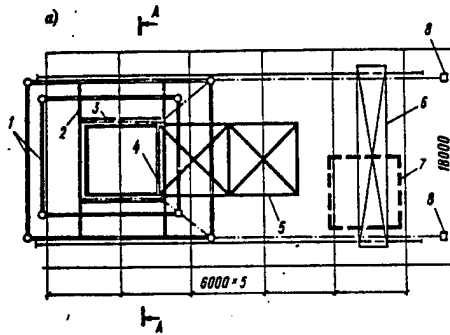
[Text] Metal constructional structure for a tower for optical control of astromirrors has been erected inside an existing building at the Leningrad Optical and Mechanical Association. The drawings for the KM [erection of the framework] of the tower were worked out by the Leningrad Section of TsNIPproyektstalkonstruktsiya [Central Scientific-Research and Design Institute for Metal Constructional Structure]. The tower for controlling astromirrors was placed within a servicing tower (figure 1). Both towers rest on separate footings and there is no connection between them in regard to height. In the lower part of the towers are expanded gantries. The gantry of the servicing tower is 11.4x15.6 meters in plan and 13 meters high. The upper part of the servicing tower is a three-dimensional structure of rectangular cross-section 6x6 meters in plan and 16 meters high. Total height of the structure is 29 meters.

The control tower's gantry, which is located within the servicing tower's, is 12x9.9 meters in plan and 12 meters high. The upper part of the control tower is 3.3x3.3 meters in plan and rises to the grade level of 25.3 meters. Two elevators for lifting servicing personnel within the servicing tower are called for: from the 0.00-meter grade to the 13.00-meter grade, and from the 13.00-meter to the 29.00-meter grade level. For people's movements within the servicing tower, a connecting passage is called for. Total weight of the structure's metal constructional structure is 141 tons.

The design for erecting the metal structure was developed by VNIPIpromstalkonstruktsiya, and Installing Administration No 26 of Spetsstalkonstruktsiya Trust erected the constructional structure. Complexity of the installation was dictated by the following factors. The designs for the premise's walls and ceiling floors where the control tower was situated precluded any possibility of using them to reinforce the block and tackle fixtures. By the time

Figure 1. Scheme for Layout of the Tower and the Equipment for Its Erection.

- a. Plan view.
 б. Elevation.
1. Gantries of servicing and control towers.
 2. Frame for support of the pulley yoke.
 3. Pulley yoke for suspension of block and tackle.
 4. Upper portion of the servicing tower.
 5. Platform for delivering modules to the lifting spot.
 6. Overhead traveling crane with g/p [load-lifting capacity] of 20/5 tons.
 7. Site for assembling modules.
 8. Electric hoists with load-lifting capacity of 8 tons.
 9. Position of next servicing-tower module before lifting.



the tower's constructional structure was to be erected, a portion of the installed equipment had been placed on the footing, necessitating that additional measures be worked out to protect it. Placing the control tower within an existing building was the main influence on the choice of the erecting technology. The PPR [work performance plan] envisioned the buildup method as the most optimal for erecting the constructional structure in the situation that prevailed at the erection site.

During erection, an overhead traveling crane of 20/5 tons g/p [load-carrying capacity] which was on the premises was used extensively where the metal structure for the tower was being assembled. It should be noted that the crane cab's floor level was lower than the upper grade level of the servicing tower's gantry, and a portion of the constructional structure was outside the servicing zone. In accordance with a suggestion by brigade leader I. M. Lebedev, the solution of raising the crane's cab by 800 mm was adopted; this enabled the amount of metal structure erectable by the overhead traveling crane to be increased. The metal structure for the gantries and the servicing tower and the control tower were erected basically by this crane.

The portion of the beams at the 12.00 and 13.00-meter grade levels that were beyond the crane's reach were assembled into modules and brought to the designed position by hoists. All the rest of the servicing-tower's constructional structure was erected by the buildup method. A pulley yoke, which rested on the frame (see figure 1), was designed and fabricated for attachment of the load block and tackle. This yoke filled the role of guides during advance of the servicing-tower sections. In order to deliver the consolidated servicing-tower and control-tower sections to the lifting spot, a platform was designed and fabricated. The constructional structure that was moved over it passed above the equipment installed on the footing, insuring its safety. Structure was consolidated into modules off to the side by the

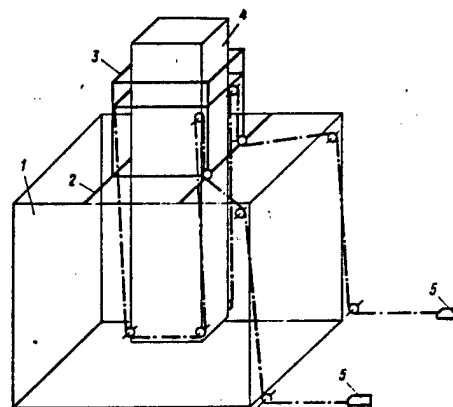
overhead traveling crane. The modules were placed on the platform by this same crane and were moved to the lifting spot by hoists.

The upper section of the servicing tower, weighing 7 tons, was consolidated and raised first. The lower section was brought under the raised section and a field joint was formed. Then the whole tower, weighing 13.5 tons, was raised into the designed position and fastened to the gantry's support beams. The gantry's support beams were opened up by 1 meter for passage of the tower and, when the tower had been raised, they were set into place. The consolidated servicing-tower sections also included crossover platforms.

The servicing tower was lifted by two tackle blocks, the reeving scheme for which is shown in figure 2. The control tower was erected in similar fashion. The load tackle blocks were suspended beyond the upper portion of the post of the servicing tower being erected. The elevator shaft between grade levels 0.00 and 13.00 meters were consolidated outside the building. It was moved to the installing site along guides through a gate and put into the designed position by the hoists.

Figure 2. Reeving Diagram for Tackle Blocks for Erecting a Tower by the Buildup Method.

1. Servicing tower gantry.
2. Frame for supporting the pulley yoke.
3. Pulley yoke for suspending the block and tackle.
4. Upper part of the servicing tower.
5. Electrical hoists with load-lifting capacity of 8 tons.



The elevator shaft between grade levels 13.00 and 29.00 meters was erected in two lightweight modules, using block and tackle and electric hoists. The block and tackle were fastened beyond the constructional structure of the service tower being erected. First the upper module was raised, then the lower one was raised and joined to the upper one.

The constructional structure of the control tower was erected by the brigade of Hero of Socialist Labor I. M. Lebedev, one of the installing administration's best brigades. The brigade leader's many years of experience, his creative initiative, and the high trades skills of the installers he supervised enabled the structure's metal constructional structure to be raised in a short time and with high quality, under the extremely confined conditions of the operating enterprise. During development of the PPR, the Lipetsk Section of VNIPIpromstalkingonstruktziya constantly maintained communications with the installing administration, and its creative collaboration helped put the progressive erecting technology into practice.

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11409

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CONSTRUCTION METHODS AND MATERIALS

USE OF LIFT-SLAB METHOD IN BUILDING DESIGN AND CONSTRUCTION

Yerevan PROMYSHLENNOST ARMENII in Russian No 4, Apr 85 pp 76-79

SAAKYAN, R.O., candidate of technical sciences and director of the All-Union Planning and Experimentation Institute of Construction and Technology

[Abstract] The lift-slab method for constructing multi-story structures is particularly widespread in the ArSSR because of its regional peculiarities which include seismicity, mountainous terrain, limited construction space and hot, dry climate. Original techniques and equipment, including 50-100-ton hoists operating simultaneously in an automatic mode, have been developed to introduce lift-slab construction in the USSR.

Research on the lift-slab construction method has been underway in the Armenian Republic since 1961 when the Ministry of Industrial Construction formed what was to become the Special Experimental Design and Construction Office (SPEKB). In 1978, this became the basis for the All-Union Planning and Experimentation Institute of Construction and Technology (VPEKTI)--the agency responsible for organizing lift-slab construction techniques and equipment. Using the lift-slab method in a region with a seismic activity factor of 7, the construction costs of 16-story cast-in-place apartment buildings are 6-27 percent below those of 16-story frame and panel buildings, 16-story frameless slab buildings and 9-story frameless, heavy-panel buildings. The lift-slab method is also used to build industrial structures weighing up to 500,000 tons, using continuous slabs on a 12-15-m column grid to provide a transient useful load of 2-3 t/m². Further, it can be used to construct multi-story buildings with any type of story height, including different heights for individual stories. Preliminary research indicates that the lift-slab method reduces expenditures on slab installation by 15 percent when used to erect multi-story industrial structures on a 12x12-meter column layout. Figures 4.

[143-12746/12790]

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