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USSR Report

CONSTRUCTION AND RELATED INDUSTRIES

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USSR REPORT

CONSTRUCTION AND RELATED INDUSTRIES

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CONSTRUCTION PLANNING AND ECONOMICS

MAJOR CONSTRUCTION, RENOVATION PROJECTS FOR 1986

Technical Re-equipping of Enterprises

Moscow PRAVDA in Russian 3 Jan 86 pp 1-2

/Article by A. Chekalin: "Construction Work in the USSR"/

/Excerpts/ Capital construction can be compared with the foundation for a building representing the entire economy. By erecting new and modernizing existing enterprises, we materialize knowledge and the works of scientists. As a result, the production potential reaches a qualitatively new level. This is borne out by the program for construction work during 1986.

Capital investments will increase by 7.6 percent and amount to almost 186 billion rubles worth during the year. High rates are involved. And the capital investment limits in the machine building complex will increase even more -- by 30 percent. Including 42 percent in the machine tool industry and 55 percent for instrument making. Growth in the program for the modernization and technical re-equipping of enterprises serves as proof of the reorientation of the national economy towards an acceleration in scientific-technical progress. In the plan for achieving these goals, 37.4 billion rubles have been allocated -- 23 percent more than last year. As a result, the average annual withdrawal of obsolete capital exceeds by a factor of 1.7 the same indicator for the 11th Five-Year Plan.

There is a vast panorama of underway construction projects. It is not easy to decide where to stop. One can take electrical engineering where several units of 1 million kilowatts each are to be placed in operation in the buildings of atomic power stations and at one of them -- the Ignalina AES /atomic electric power plant/ in Lithuania -- there is a capability of one and a half million kilowatts.

Permit me to cite some large installations of the machine building complex which are accelerating scientific-technical progress in their oblasts. In power engineering machine building, following modernization, new capabilities are being placed in operation at the Leningrad Metal Plant imeni XXII Syezda KPSS, the Kharkov Turbine Plant imeni S.M. Kirov and at a number of other enterprises. The capabilities of the Volgodonsk Atommash Plant are increasing.

In particular, a decrease is taking place in the smelting of steel using obsolete methods -- in open-hearth furnaces -- and its production in converters

and electric furnaces is increasing and also by means of direct recovery from ore. Such modern production efforts are being placed in operation at the Oskolskiy Electro-metallurgical Combine in Belgorod Oblast, the Moldavian Metallurgical Plant in Rybnitsa and at the Far Eastern Metallurgical Plant. The rapid renovation and development of coke-chemical production operations is planned at the Nizhnetagil, Chelyabinsk and Magnitogorsk metallurgical combines and at the Krivoy Rog, Donetsk and other coke-chemical plants.

Of the overall volume of capabilities developed during a year's time for the production of mineral fertilizers, modernization and technical re-equipping account for roughly three fourths. More progressive output will be produced by the collectives of production associations and plants in Kemerovo and Berezniki in Perm Oblast, Grodno, Samarkand and Chirchik in Tashkent Oblast and in Kedaynyay (Lithuanian SSR). The production of chemical agents for protecting plants is increasing.

In conformity with the all-round program for developing the production of consumer goods and the sphere of services, an increase is taking place in the capabilities at enterprises of the light and other industrial branches of Group "B". This includes spinning-weaving, sewing and textile factories and combines in Chelyabinsk, Leningrad, Sumy, Andizhan, Vilnyus and in many other areas. As a result of the placing in operation of new installations, the quality of footwear is improving, including in Tula, Vinnitsa Oblast, Semipalatinsk, Taldy-Kurgan and Yerevan.

The solving of social problems occupies a special place in the plans. The plans call for more than 114 million square meters of housing space to be placed in operation, with more than one third of this space being in rural areas. Schools will be expanded to accommodate 1,100,000 more students and childrens' pre-school institutes -- 628,000 more pupils.

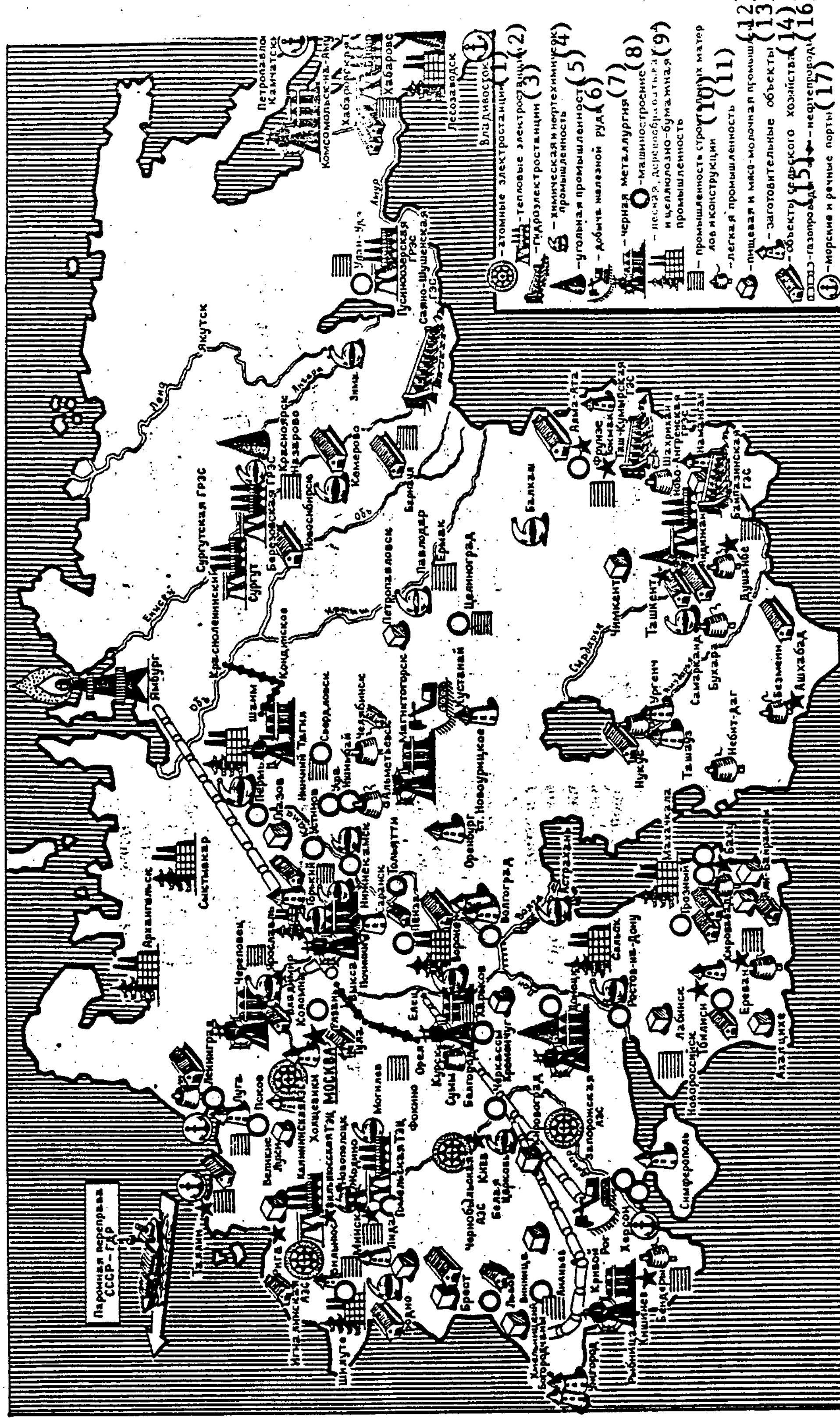
Map of Underway Construction Projects

Moscow EKONOMICHESKAYA GAZETA in Russian No 1, Jan 86 pp 12-13

/Map: "Underway Construction Program of Builders"/

Key:

1. Atomic electric power stations
2. Thermal electric power stations
3. Hydroelectric power stations
4. Chemical and petrochemical industry
5. Coal industry
6. Extraction of iron ore
7. Ferrous metallurgy
8. Machine building
9. Timber, wood processing and pulp and paper industry
10. Industry of construction materials and structures
11. Light industry
12. Food and meat and dairy industry
13. Procurement installations
14. Agricultural installations
15. Gas lines
16. Petroleum lines
17. Sea and river ports



7026
CSO: 1821/101

CONSTRUCTION PLANNING AND ECONOMICS

RESERVES FOR IMPROVING CAPITAL CONSTRUCTION

Moscow EKONOMICHESKAYA GAZETA in Russian No 27, Jul 85 p 10

[Article by N. Garetovskiy, doctor of economic sciences, under rubric "Economic Mechanism of Intensification"]

[Abstract] In light of criticism of scientific-technical progress in capital construction, the present tasks are to improve construction planning and design, concentrate capital investments, meet normative construction deadlines and tranform construction into a unified industrial process. Capital investment limits for the 12th Five-Year Plan will be determined through unified planning of existing production and new construction. Capital-investment planning will be based on: 1) the coefficient of equipment shift operation; 2) sector annual equipment operation norms and 3) norms for utilizing productive capacity for 1986-1990. Capacity should be increased through equipment replacement and reconstruction as much as possible, since these expenditures are very efficient. The share capital investments devoted to reconstruction must be increased from one third to at least one half. Special attention must be given to carry-over construction projects. To reduce costs, any superfluous facilities or postponable secondary facilities should be excluded from projects. Ministries and departments must have their plans for putting production capacity into operation broken down by quarters for the plan year and by 6-month periods for subsequent year. Construction of housing, community buildings must be based on continuous 2-year planning. Special attention must be given to building housing and community buildings simultaneously with enterprise construction. Project planning and project-design quality must be drastically improved. Projects often contain inefficient technological solutions, which necessitate reworking and result in upwardly revised estimated costs. Projects should include only the latest equipment and technology. All-union and departmental technological-design norms, construction-design normative documents and norms and rules for design and construction are being reviewed. Technico-economic indicators are to be more important in construction planning decisions. Creation of additional productive capacity must be achieved through higher productivity and with production-workforce reductions. The normative labor intensity of construction is being established in project-estimating documentation. For large enterprises, priority facilities, including housing and community facilities, will be singled out as the basis for

determining capital-investment and construction-installation limits and equipment and labor needs. All sections must be required to have a construction-organization project, which breaks down the technological units and stages of work, determines the work sequence, shows construction and equipment-supply deadlines and needed materials, labor, and means of mechanization. The brigade contract method, an important reserve for raising productivity and moving up completion deadlines, is being slowly implemented by the Ministries of Construction in the Far East and Transbaykal Regions, of Installation and Special Construction Work, of Land Reclamation and Water Resources and several others. Personal responsibility will be increased for timely completion of development work, submission of work-production projects and proper estimation of costs. Project organizations have the right to issue obligatory stop-work instructions if the customer or contractor violates project requirements or normative documents. For 1986, prices for project work will be based on the projected facility's basic indicators: capacity, extent, volume, etc. in order to make prices independent of total construction-installation costs, while providing flexibility for additional necessary expenditures. An economically justified level of profitability is to be established. Gosplan, Gostroy and the Ministry of Finance are to improve construction planning and financing, particularly for reconstruction and equipment replacement; improve quality of project-estimation documentation and increase designer supervision over construction.

12595/9604
CSO: 1821/152

CONSTRUCTION PLANNING AND ECONOMICS

UDC 69.003:658.152.011.46

CAPITAL CONSTRUCTION, CREDIT IN UkSSR DISCUSSED

Moscow EKONOMIKA STROITELSTVO in Russian No 9, Sep 85 pp 21-25

[Article by V.P. Matviyenko, candidate of economic sciences, administrator of the Ukrainian Republic Office, USSR All-Union Bank of Financing Capital Investments: "Financial-Economic Mechanism and Problems of Economic Intensification"]

[Abstract] This article discusses problems of capital construction in the UkSSR, as well as present and potential solutions to these problems. One problem is the large volume of incomplete construction; to correct this, the number of new projects was reduced to direct more funds to those already started. Another problem is the distribution of a large share of funds in final year of construction projects. Poor cost estimates are leading to increased costs. The ministries lack long-term, integrated equipment-replacement plans. Equipment-replacement projects are of poor quality because most are done by the enterprises themselves; institutes must devote more time to this work. In many cases, equipment prices are higher than justified by the productivity increases they provide.

Management would be improved if construction-installation plans were more closely linked with the title lists; the work volume is presently considerably below that specified in the title lists. The amount of uninstalled equipment in storage at construction sites is constantly increasing, totalling 2 billion R at the beginning of this year. The UkSSR office of USSR All-Union Bank of Financing Capital Investments is monitoring capital-construction plans to ensure that they are optimal. The coefficient of capital concentration, now being calculated by computer, shows that the best level of planning is in equipment-replacement projects, followed by new construction and, lastly, enterprise expansion and reconstruction. Progressive technology, new equipment and production automation account for 45 percent of equipment-replacement plans of the USSR Ministry of Ferrous Metallurgy, USSR Ministry of Power and Electrification, USSR Ministry of Nonferrous Metallurgy, Ministry of Chemical Industry, Ministry of Electrical Equipment Industry, Ministry of Instrument Making, Automation Equipment and Control Systems, Ministry of Machine Tool and Tool Building Industry and Ministry of Machine Building for Light and Food Industry and Household Appliances. A scientific-technical program for the ferrous-metallurgy sector is being successfully carried out. Two thirds of the funds for equipment replacement and reconstruction come from production development funds. The proportion of long-term credit for these purposes should be greatly increased,

in order to permit the banks to monitor this situation more extensively. In many cases, the credit period should be coordinated with the payback period when the latter is greater than the standard credit period, a common situation in heavy industry. Equipment expenditures should be linked with installation limits. The system of paying for entire systems, rather than paying for individual subunits, should be expanded in order to speed up deliveries of entire systems.

12595/12232
CSO: 1821/54

CONSTRUCTION PLANNING AND ECONOMICS

LACK OF GAS DETECTION DEVICE CAUSES ACCIDENT AT SITE

Moscow STROITELNAYA GAZETA in Russian 22 Nov 85 p 3

/Article by V. Vaskova, technical inspector for labor of the trade union's central committee: "Go Carefully: Gas"/

/Text/ Danger occurs when least expected. Such was the case here. In the city of Kansk in Krasnoyarsk Kray, in response to a task assigned by the deputy chief of the Mechanization Administration of the Selstroymekhanizatsiya Trust of the Krasnoyarskkrayselstroy Association N. Sholenkov, a brigade of workers was carrying out a hydraulic test on a water line.

It can be stated directly: a technological chart for carrying out the test with information on the sequence of operations, an order-permit for the carrying out of dangerous operations, a list of protective equipment and the rules for using them had not been made available.

The workers attempted to carry out one or two of the measures. But how could they determine the presence of gas if no control instruments were available? The simplest method -- ignite a sheet of paper and lower it to the bottom of a well.

The sheet of paper appeared to burn well at the bottom of the well. A. Savchenko, recognizing this as a true indication of the absence of gas, lowered himself into the well and lost consciousness.

Maynich was the first to notice the gas. He later mentioned that he saw a small stream of grey smoke issuing from the well at the moment that Savchenko, with elbows resting on the cone of the well, unscrewed the bolts on the water line connection. Maynich, not feeling very well, sent driver A. Tolmachev off for assistance, as the saying goes, to meet the danger with "bare hands."

The work superintendent had no means at his disposal for rescuing his workers. He began stopping vehicles out on the highway. A rope was finally obtained from the third or fourth driver. It was used for raising Tolmachev out of the well.

Each leader and each rank and file worker must be familiar with ANiP /Construction Norms and Regulations/ III-4 - 80, Chapter 4 entitled "Industrial

Safety Measures in Construction," in which points 2.33 and 2.34 clearly indicate that prior to commencing work in areas where harmful gas could be present, including closed spaces, wells, trenches and excavations, the air environment should be analyzed and the work carried out in gas masks. In the process, two workers should be located up above on the surface in order to provide protection for those carrying out the work, with use being made of ropes fastened to their safety belts.

In the conclusion submitted by the technical inspector for labor of the trade union's central committee for Krasnoyarsk Kray V. Chernyshev, it was indicated that the persons responsible must be punished. The deputy chief of the administration N. Sholenkov -- for having the workers carry out the hydraulic test in the absence of an order-permit; the chief engineer of the mechanization administration N. Dolgushin -- for poorly prepared work associated with instructing the workers in the rules for protecting labor; V. Maynich -- for irresponsible carrying out of his official duties in connection with organizing work involving a raised level of danger.

In conclusion, nothing was said regarding the guilt borne by the supply organizations or the service for intra-departmental control. To a considerable degree, they promoted the situation wherein the requests for protective equipment were composed in a formal manner and control instruments were made available to the rank and file ITR's /engineering and technical personnel/ on a very limited basis. The builders would like to have had LBVK lamps, which are simple to use and which are reliable in operation. At the present time, the requests for such lamps, for this one main administration, amount to 1,300 units. A similar situation prevails in other specialized organizations of the branch. It is obvious that USSR Gosplan must examine the problems concerned with ensuring that reliable safety instruments are made available for those workers and ITR's who are called upon to perform work in chambers and wells.

For example, let us take Glavmosinzhstroy which is engaged mainly in carrying out such work in Moscow. This year, only 18 gas analyzers were obtained here despite the fact that 200 were ordered. Only 50 instead of 200 signalling devices were obtained and hose gas masks -- only 10.

Incidents involving the appearance of harmful gases in wells, excavations and other closed spaces occur rather frequently. Thus each leader must devote thought first of all to ensuring that safety measures are being observed at an installation.

7026
CSO: 1821/101

CONSTRUCTION PLANNING AND ECONOMICS

DICTIONARY OF CONSTRUCTION, CIVIL ENGINEERING PUBLISHED

[Editorial Report] A polyglot construction dictionary in English, German, French, Dutch and Russian was published in 1985 (signed to press 7 July 1985) in Moscow by the "Russkiy Yazyk" Publishing House. The dictionary contains 14,000 English terms and their foreign equivalents. In addition to the fields of construction and civil engineering, the dictionary also covers related disciplines such as architecture, town planning, airfield, railway and underground construction. The authors are Sergey Nikolayevich Korchemkin, Sergey Vasilyevich Kurbatov, Naum Borisovich Sheykhon and others. The Russian title of the publication is STROITELNYY SLOVAR.

CSO 1821/110

CONSTRUCTION PLANNING AND ECONOMICS

BRIEF

ROLE OF PLANNING--The effectiveness of planning must be raised substantially. For us, the cost of plans amounts to 2-3 percent of the cost of construction, while in a majority of developed countries throughout the world this figure is greater by a factor of 2-2.5. A mechanical lowering of the cost of planning even by 30 percent lowers the cost of construction by only 0.6-0.9 percent. However the actual losses caused by less than optimum planning solutions exceeds this savings by tenfold. A true reduction in the cost of construction on the whole can be achieved only by increasing the expenses for research and alternative planning. /by V. Andreyev, chief engineer for a customer group of the Southern Urals Railroad/ /Excerpt/ /Moscow STROITELNAYA GAZETA in Russian 20 Nov 85 p 2/ 7026

CSO: 1821/101

INDUSTRIAL CONSTRUCTION

MATERIAL FOR TALLINN HARBOR PROJECT VIA LATVIAN SHIPS

Riga CINA in Latvian 11 Jun 85 p 2

[Article by D. Gefters: "River Sailor Sea Routes"]

[Text] The ship "Gauja" began its journey in early morning from the river port's cargo area, which was recently put into service on Daugava's left bank near its estuary. The ship, which belongs to the Latvian SSR Council of Ministers Central Board river fleet administration, needed to complete in its itinerary of Riga-Ventspils-Tallinn-Viborg-Riga a trip nearly 900 miles or more than 1700 kilometers in length.

The Republic's Central Board river fleet administration organized this year, combined river and sea coast shipping vessels. In the last year of the five-year plan, or river fleet workers will have to transport on the sea alone over twice as much cargo as in the past year. Now at its disposal are three ships--"Gauja"--"Roja"--and "Turinsk", whick were transferred from Latvian ocean shipping, and two sea coast shipping ships--"Boris Pustovoitov" and "Rizskijzaliv".

I. Markov, the Republic's Central Board river fleet administration deputy chief, commented that in preparing for the honor of receiving the PSKP XXVII Congress, our collective increases the rate of cargo transport important to the national economy. One of the important navigational tasks this year, which was put to our ship crews and dock workers, is to assist in the construction of the large and new harbor for ocean trade at Tallinn. We supply reinforced concrete and other materials to this Soviet Union Communist Youth League's construction project.

On the bridge of "Gauja" is captain Edward Levitskis. He is an experienced ship's operator, who has been well trained on Latvian ocean fleet tankers and cargo ships, and a former student of well known Latvian captains Anatolij Belikov, Pavel Glebov, and Valentin Jegorov. Such are our contemporary needs: river shipping ships on voyages are commanded by sea captains.

After twelve hours we arrived at Ventspils. The ship moored at the Baltic marine construction and assembly work area reinforced concrete fabrication terminal. There the ship was loaded with enormous, five-ton tetrapods and hollow piles weighing twelve tons each. The loading was accomplished by the

agile crew of the floating crane "Chernomorec". It was already finished by the afternoon.

"Our crew stands watch in honor of the PSKP XXVII Congress," said the captain. "In our commitments we have undertaken to transport cargo above goal in each trip. This time we will deliver nearly an additional 40 tons to Tallin's new harbor. For a medium size ship whose cargo capacity is 1000 tons, that is not little. Among other things, this trip is also above plan."

"Gauja" prepares for departure. Course is for Tallin. Arriving there, the Soviet Union Communist Youth League's construction project, the new harbor at Tallin, becomes visible in broad panorama. A forest of structures on shore. We see the Baltic sealane administration dredges "Irbenskij" and "Aleksandr Uvarov", whose home port is Riga, and other ships. They are dredging the channel along which ocean liners will be passing, already next year, to the new harbor's wharfs.

We quickly moored at the freight area docks. The harbor crane began operation immediately. It piled the transported reinforced concrete fabrications on shore as well as into a barge which had tied up at the "Gauja". The other ship from Riga, "Roja", was also unloaded.

At one wharf we met the Baltic marine construction and assembly work 423rd construction administration's senior work manager Nikolai Rizhakov. He is 32 years old. He graduated from the Leningrad Polytechnic Institute seven years ago. The young builder of marine structures, built Ventspils harbor's industrial and trade wharfs. Now under his direction, wavebreakers and jetties are being built, where incidentally the tetrapods and hollow piles which we brought will be placed. Talking about the size of the new construction, senior manager N. Rizhakov mentioned only one number: the new freight area extends along the seashore for eight kilometers.

The Soviet Communist Youth League's construction project is being built by representatives from many republics, together with Estonian workers. Latvian marine structure builders, river shipping workers, and sailors are proud of their investment in this important project. The first round of 5.5 million tons of cargo will be placed in commerce next year.

While the ship was docked in the harbor, a group from the crew went on an excursion through the Estonian capital. Tallinn is beautiful in springtime. The Kadriorga seashore, the famous mermaid and the Olympic game complex at Pirita attract thousands of people. It is seen everywhere, how considerately and thoughtfully the people of Tallinn treat the city and its architectural monuments, built in distant oldentimes. The ship's unloading is finished. We bid farewell to the hospitable Tallin's new harbor dockworkers and construction workers, and once again set to the sea. We have to sail to the ancient Russian city of Viborg and there take on a cargo of building material, destined for Riga.

The weather is beautiful in the Gulf of Finland. We sailed by many islands with sonorous place names. Near Visock Island, Mihail Kalninsl, Viborg

harbor's senior pilot, boarded "Gauja". Yes, a Latvian, the son of Latvian Red Rifleman brigade Georgija Kalninsh, the prewar Baltic sea shipping chief. Mihails Kalninsh is a sea captain. After graduating from the middle and upper naval academy, he worked in the Arctic. The last ten years he has worked in local pilot service.

"Gauja" was expected at Viborg harbor's wharfs, and already toward the evening she was fully loaded. Still one night's journey, and then Riga.

The voyage along the Baltic Sea, the Gulf of Riga and the Gulf of Finland is completed. In one trip the crew of "Gauja" transported 100 tons of cargo above plan.

12908/12948
CSO: 1808/005

INDUSTRIAL CONSTRUCTION

UDC 69.003:65.014

GOSSTROY OFFICIAL DISCUSSES ROLE OF CAPITAL CONSTRUCTION

Moscow EKONOMIKA STROITELSTVA in Russian No 11, Nov 85 pp 42-46

/Article by Yu.S. Lychkin, chief of the Construction Economics Department of USSR Gosstroy: "Improving the Structure of Construction Control"/

/Text/ An important role is played by capital construction in the development of the socialist economy. The development of industry, agriculture and other national economic branches and improvements in the well-being of the people are realized mainly as a result of the carrying out of a vast program of construction.

During the 1971-1985 period, the volume of capital investments in the national economy has exceeded the level of the past 15 years by a factor of roughly 2.4. During this period, the overall value of the fixed capital of the national economy increased by a factor of 2.7, including productive capital -- by threefold. More than 4,000 state industrial enterprises will be placed in operation, the production base for agriculture has been improved radically, the network of mainline communications has been expanded considerably and more than 1.6 billion square meters of housing space have been built.

The growth in the capital investment volumes was accompanied by substantial improvements in their structure and this in turn was the result of planned national economic development. Included among these improvements were:

...an increase in the proportion of expenses for developing the fuel-energy complex and agriculture, with a reduction taking place in the proportion of investments in the manufacturing industry;

...an improvement in the technological and reproductive structure of capital investments, including by means of a reduction in the proportion of construction-installation work in the capital investment structure (from 62 percent in 1970 to 49 percent in 1983) and growth in expenses for the modernization and technical re-equipping of existing enterprises;

...shifting of work volumes into the eastern and northern regions, with an increase taking place in the proportion of these volumes with regard to the overall capital investments and construction-installation operations.

At the same time and despite the definite achievements realized, capital construction is still not fully satisfying the requirements of the national

economy and its effectiveness has decreased somewhat. This is borne out for example, by such phenomena as:

...a systematic falling behind in the placing in operation of fixed capital and production capabilities, compared to the planned tasks, and also in the level for making use of capital investments;

...an increase in the capital-intensiveness of production;

...a reduction in the rates of growth for labor productivity in construction, excessive duration of construction operations compared to the norm, continuation of an above-normal level of unfinished construction, despite a certain reduction in this level during the 11th Five-Year Plan.

Serious shortcomings in capital construction were pointed out in the decisions handed down during the 26th CPSU Congress and in a number of other party documents. The status of capital construction was criticized sharply during the April (1985) Plenum of the CPSU Central Committee. Thus, just as in the past, an improvement in the effectiveness of capital construction continues to be an important problem. Key tasks include achieving radical improvements in planning and administration, ensuring the completion of planned tasks and overcoming a dispersion of capital investments and departmental and organizational scattering of construction production. Only if these shortcomings are eliminated will it be possible to achieve a comprehensive balance in the investment process, a reduction in the number of installations being built simultaneously, normalization of the construction stockpile and, in this manner, the creation of the prerequisites required for the rhythmic organization of construction, the placing in operation of installations in keeping with the established schedules, radical improvement in the use of the available construction production potential, a sharp reduction in the duration of construction and an acceleration on this basis in the introduction of scientific and engineering achievements into the national economy.

The chief trends to be pursued for improving the system of construction administration include raising the scientific level of planning, improving the organizational structure and methods of administration, the mechanization and automation of production processes, including administrative labor, the consistent carrying out of the principles of democratic centralism and more extensive participation by workers in the administration of production operations.

Within the construction administration system, a special place is occupied by those questions concerned with the organizational structure for administration, the solutions for which are called for in the general, departmental and territorial plans for construction administration. These plans must encompass the entire administrative structure for construction and they must provide complete solutions for the tasks concerned with improving the branch and territorial principles of control. In the decree of the CPSU Central Committee and the USSR Council of Ministers entitled "Improvements in the planning, Organization and Administration of Capital Construction" and in the decree of the USSR Council of Ministers and the AUCCTU entitled "On Improving the Organization, Wage System and Stimulation of Labor in Construction," measures are outlined which derive directly from the solutions for these tasks. During

the April (1985) Plenum of the CPSU Central Committee, it was pointed out that the time is at hand for improving the organizational structures for administration, eliminating excessive elements, simplifying the staff and raising its efficiency. This fully applies to construction operations.

In 1984 there were more than 32,000 state, cooperative and interfarm construction and installation organizations in operation throughout the country, all of which were subordinate to more than 100 union and union-republic ministries, departments and other economic organs. Of the overall volume of construction-installation work, 86 percent is being carried out by state construction and installation organizations, 6 percent by interfarm and cooperative enterprises and organizations and 8 percent by repair-construction organizations of various ministries and departments. In 1984 the overall volume of construction-installation work carried out on a contractual bases (excluding capital repairs) throughout the country amounted to 78 billion rubles. Of this volume, 69 percent was carried out by the organizations of construction ministries and departments, 19 percent by organizations of non-construction ministries and 12 percent -- using the economic method.

Various organizational forms of the principal and middle levels of administration are in operation in construction at the present time. At the principal level of administration, a leading role is played by the construction-installation trusts, of which there are 3,000 throughout the country, with 70 percent of them being subordinate to construction ministries. The solution for the problem of improving capital construction is on the whole largely dependent upon the work of this considerable number of subunits of the principal cost accounting element in construction, and particularly in the construction ministries, being directed in an accurate and efficient manner.

One large shortcoming in the existing structure of construction administration is its multiple-unit nature, which leads to a reduction in the responsibility of organizations for their assigned tasks, an extension of the path for the passage of information and, it follows, a reduction in operational efficiency. In the process, large difficulties are created with regard to coordinating the work of those participating in construction operations.

A definite amount of work is being carried out in the interest of reducing the number of elements within the ministries. Thus, within USSR Mintyazhstroy /Ministry of Construction of Heavy Industry Establishments/, the combines Sibmetallurgstroy, Tagilstroy and Sayantyazhstroy have recently been eliminated as excess administrative elements among the trusts and main administrations. Today, within USSR Mintyazhstroy, a two and three element system of construction administration has been established on the territory of the RSFSR. This work must be carried out in all of the ministries in the interest of ensuring that the requirement for converting over to the two and three element administrative system is carried out.

Territorial main construction administrations are also operating in the middle administrative level in addition to the construction ministries of union republics. Operating on the territory of the RSFSR within the structure of USSR Mintyazhstroy, USSR Minpromstroy /Ministry of Industrial Construction/ and USSR Minstroy /Ministry of Construction/, they were transformed into large

construction-installation complexes, having at their disposal cadres of highly skilled workers and engineering-technical personnel, powerful bases of the construction industry, mechanization and transport subunits and planning-technological organizations.

These main administrations include general-construction and specialized trusts and also production construction-installation associations. The concentration in the main administrations of large volumes of construction-installation work and material-technical and labor resources makes it possible to develop specialization and to achieve the maneuvering of resources for the successful carrying out of the state plan.

The activities of Glavzapstroy /Territorial Main Administration for Construction in the Western Regions of the RSFSR/ of USSR Minstroy provide an example of positive work. Over a period of a number of years, it has been successfully carrying out the plans for placing production capabilities and installations in operation mainly at modernized enterprises having high technical-economic indicators. Glavzapstroy is the only contractual organization for all installations of industrial and rural construction in Leningrad Oblast and Leningrad and, as a result, a solution has been found here for the problem of eliminating excessive departmental operations and converting the main administration into a leading organ for construction administration, one which coordinates the development of the capabilities of the construction organizations and their production bases in the region of its activities.

Enterprises of the construction industry which are located on the territories of union republics which do not have an oblast breakdown, autonomous republics, krays or oblasts must as a rule be concentrated under the direction of leading territorial organs of construction administration. When developing the base for the construction industry, the leading organs are obligated to take into account the requirements of all organizations engaged in carrying out construction-installation work in a given region. In the event of a scarcity of work, the operations of the main administration must be spread over several oblasts. The carrying out of the mentioned measure will produce a substantial economic effect and make it possible to regulate considerably the system of administration.

Meanwhile, the construction ministries have still not advanced any recommendations for raising the role played by the territorial main construction administrations.

In the ministries, in addition to the main administrations, there are also territorial (oblast) construction administrations, the workload of which is comparatively light. Naturally, this summons forth an increase in the construction production expenses and particularly the administrative-managerial expenses. In such instances it is considered advisable to examine the possibility of converting over to a more consolidated system of administration, with the abolishment of such a middle level or through the reorganization of these administrations into territorial main administrations for construction, with an increase taking place in their volumes of construction-installation work by merging them with the construction organizations of other ministries and departments operating within the same territory.

A considerable shortcoming in the organization of construction administration is the involvement of many departments, with the construction in a republic, kray or oblast being carried out by subunits of construction ministries and a large number of organizations of industrial ministries and various departments. As a result, the subunits of the construction ministries, created especially for carrying out the construction work, often perform only a small proportion of the overall volume of work, since the principal portion is as a rule carried out by organizations of non-construction ministries and departments. For example, there are 745 primary construction organizations of 60 ministries and departments operating in Krasnodar Kray and they carry out more than 1.2 billion rubles worth of construction-installation work annually. In Gorkiy Oblast, which is located in the sphere of activity of USSR Minstroy, Glavvolgovyatskstroy is carrying out less than one half of all of the work available in this large administrative region of the country. The remaining volumes of work are being carried out by more than 200 small organizations of 17 ministries and departments.

In a majority of the republics, krays and oblasts, the creation of organizations in accordance with the principle of branch construction administration brought about the development of many departments in the construction industry, with attendant elements of reserve and self-support.

The involvement of many departments in construction appeared not only as a result of an increase in the number of branches and a need for balance in the requirements of certain clients and in the capabilities of construction ministry organizations, but also and chiefly as a result of shortcomings in the managerial mechanism present in construction. A reduction in its effect must be achieved mainly through the carrying out of work based upon inter-enterprise and inter-branch cooperation. In addition, a more active change is needed in the construction administration systems towards greater use of the territorial approach. The decrease that has been noted in recent years in the branch trend in a number of general construction ministries and also the change in the geography of construction require a strengthening of the effect of this approach when preparing recommendations for improving construction administration. The development of the construction industry must also be carried out taking into account a reduction in freight turnover and cross-hauls in railroad transport and this is being achieved by eliminating the existing "open field system" in the zones of activity of the general construction ministries.

The regulation of existing regionalization in the activities of USSR Minstroy, USSR Minpromstroy and USSR Mintyazhstroy should ideally be carried out based upon prepared variants, which call for an increase in the level of territorial integrity for each of the mentioned ministries, maximum combining of the zones of their activity with the borders of the country's economic regions, reducing to a minimum the number of resubordinated middle echelon organizations, maintenance of the ratio for work volumes and capabilities of the production base and so forth. However, despite the logical and consistent nature of these proposals, almost no recommendations have been forthcoming from the ministries for eliminating the existing involvement of many departments or for regulating territorial administration of construction.

Under conditions involving constant growth in the volumes of capital construction, considerable importance is attached to those problems concerned with consolidating the construction-installation organizations. It is known that the presence of small organizations of various departments leads to a dispersion of material and labor resources, personnel turnover, a reduction in the quality of work, an increase in the duration of construction and the creation of weak production bases and a large number of cross-hauls. Practical experience unquestionably underscores the high effectiveness of work by large organizations compared to smaller ones. However, notwithstanding the obvious advantages of larger organizations, the rates of growth in the number of organizations in recent years have exceeded the growth in the volumes of construction production. The growth in the number of construction organizations in branch (non-construction) ministries, which at the present time are carrying out more than 30 percent of the overall volume of construction-installation work using the contractual and economic methods, has been particularly noticeable.

The increase in the number of construction-installation organizations, which brought about a reduction in the level of concentration in construction, is considered to be one of the reasons for the slow growth in recent years in the level of specialization (from 61 percent in 1975 to 64 percent in 1983) and in labor productivity in construction. Small organizations are incapable of developing technological specialization within themselves or of creating the subunits needed for carrying out a definite type of work in a stable manner.

A priority and thus very important direction to be followed for raising the effectiveness of the existing structure for construction administration is that of strengthening and elevating the role played by construction-installation trusts to the maximum possible degree. During the period of their existence, they underwent a number of changes both from a structural standpoint and in carrying out the role assigned to them within the construction system.

During the 1940-1950 period, the construction-installation trusts were all-round organizations which included a production base, mechanization equipment, transport, auxiliary production efforts and other service facilities. Such a structure for the subunits ensured to a certain degree unity in the economic administration and production of the final product. However, with the development of construction industrialization and the availability of more mechanisms, the administration of construction production and other facilities within the framework of the former trusts became more difficult. In this connection, the mechanization equipment and transport were as a rule transferred over to middle echelon organs which were higher than the trusts.

Under modern conditions, excessive regulation of the work of the trusts led to a situation wherein many of them displayed less responsibility for the placing in operation of enterprises, buildings and installations in keeping with the established schedules and they began carrying out in an unsatisfactory manner their function of coordinating the work of all participants in the construction process. Other shortcomings were also observed.

In connection with the above, the decree of the CPSU Central Committee and the USSR Council of Ministers entitled "Improvements in the Planning, Organization and Administration of Capital Construction" requires that a construction-installation trust, production construction-installation association or an

organization equivalent to the latter serve as the principal cost accounting element for administering construction production. It has been established that the decisions handed down by trusts -- general contractors for matters concerned with the carrying out of plans and work schedules -- are mandatory for all participants in construction, regardless of their departmental subordination. The trusts are provided with all of the necessary mechanization and transport equipment either by means of equipment allocations or through the assignment to a trust of specialized organizations for transport and mechanization, which are included in the structure of organs of middle echelon administration.

Based upon these principles, USSR Gosstroy and USSR Gosplan this year approved the statute for a construction-installation trust; it will enter into force on 1 January 1986. The introduction of this statute will make it possible to regulate to a considerable degree the work of a trust within the system of construction administration and it will raise its role as the principal cost accounting element of administration.

The construction-installation trusts and local construction subunits in existence at the present time are to a considerable degree small in nature. In 1984, only trusts of Minneftegazstroy and Minmontazhspetsstroy /Ministry of Installation and Special Construction Work/ had annual work volumes in excess of 40 million rubles and trusts of Mintyazhstroy USSR and Mintransstroy /Ministry of Transport Construction/ -- more than 30 million rubles. The average annual workload for trusts in the remaining construction ministries and departments amounted to from 20 to 27 million rubles and it was even lower in USSR Minpromstroy, USSR Minselstroy /Ministry of Rural Construction and USSR Minvodkhoz /Ministry of Land Reclamation and Water Resources/. Local construction-installation organizations (SMU /construction and installation administration/, PMK /mobile mechanized column/) had annual work volumes within USSR Mintyazhstroy and Minneftegazstroy in excess of 7 million rubles, USSR Mintazhspetsstroy, USSR Minenergo /Ministry of Power and Electrification/, Minvostokstroy and USSR Minstroy -- from 5 to 6 million rubles and the lowest workload was found in USSR Minselstroy and USSR Minvodkhoz -- only 1.8 million rubles. To a certain degree, these fluctuations in workload resulted from the specific nature of the construction work and yet they also derived to a considerable degree from the fact that proper work was not carried out in connection with strengthening the construction organizations, especially the trusts, in a number of ministries. Thus the initial variants for the general plans presented by the ministries to USSR Gosstroy did not contain recommendations for strengthening the construction-installation organizations. In USSR Minselstroy, the plans called for growth in the average workload for trusts from 20.7 million rubles to 21.1 million rubles, or by 2 percent, with generally no growth in workload being required for local organizations. A similar situation with regard to local construction-installations has been noted among a number of other construction ministries.

The consolidation of construction-installation organizations constitutes a very important task of the construction ministries, since only this can ensure efficient work by the organizations and create the conditions required for shortening the duration of construction, raising its quality and improving other technical-economic indicators. This then explains the decision concerning

the establishment of new and raised qualifications for the trusts and SMU's, with regard to grouping them according to the wages for leading and engineering and technical personnel.

As mentioned above, the specialization of construction-installation organizations has been developing weakly over the past few years. At the same time, it is known that the development of specialization promotes an improvement in labor productivity and in the quality of construction-installation work, it lowers production costs, it shortens the duration of construction operations and it creates the conditions required for accelerating scientific-technical progress. Internal specialization, that is, the creation of specialized organizations within large trusts and associations, for example for simple sanitary engineering and electrical installation operations, is especially effective. In such instances, the organizations of USSR Minmontazhspetsstroy are enlisted for carrying out more complicated types of installation work requiring the use of highly skilled workers.

At the present time, the inter-departmental merging of single-profile construction-installation organizations has undergone some development. For example, in the Latvian, Estonian and Georgian SSR's, the merging of organizations of USSR Minselstroy with the organizations of general construction organizations, which carry out rural construction and which operate on the same territory, has been carried out.

There must be further development of the combined forms for construction administration. In addition to creating new housing-construction combines, the structure for existing ones must be regulated, since there are several DSK's /house building combines/ and KPD /large-panel housing construction/ trusts, subordinate to various departments and at times even to just one department, operating in some regions and even points of the country.

The development of combines in construction must be carried out in a manner so as to encourage their gradual development into organizationally new forms: city-construction and plant-construction firms and associations and large organizations for fully-prefabricated construction in the rural areas. For the future, as the production base becomes stronger, they must accept the responsibilities of general contractors, becoming the principal producers of construction output for a definite branch in the regions. In connection with the considerable growth in housing volumes, further development must be ensured for the rural housing construction combines, especially in the interests of farmstead construction in the rural areas.

An important trend with regard to improving construction administration is that of raising the mobility of the construction organizations. This assumes the use (especially in remote regions) of mobile construction formations, which operate on the basis of rear support bases and which employ the expeditionary, watch and mixed methods for organizing production operations. Such a system for carrying out construction programs is more efficient and economically justified, especially during the pioneer period devoted to developing large regions of the country. The production base for developed branches created during this stage and the social infrastructure will make it possible in the future to convert over (when necessary) to the formation of fixed construction organizations or to use a complex of fixed and mobile construction formations.

All of these measures must exert a substantial influence with regard to sharply improving the organizational structure of construction administration, radically raising the technical level of construction production and introducing progressive forms for organizing production and labor into operations on an extensive scale.

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AGRICULTURAL CONSTRUCTION

DEPUTY MINISTER OUTLINES BELORUSSIAN RURAL CONSTRUCTION

Minsk SELSKAYA GAZETA in Russian 2 Oct 85 p 2

[Interview article under the "City-Countryside" rubric: "New Construction Moves Ahead in the Country"]

> [Excerpt] The food production program is a concern of the entire population. In a conversation with our non-staff correspondent V. Dovnar, First Deputy Minister V.S. Voronov discusses the contribution which the collectives of enterprises of the Ministry of Industrial Construction are making to its fulfillment.

[Question] Vyacheslav Stepanovich, in implementing the Food Production Program many industrial enterprises have established their own agricultural sections. What are components of the Ministry doing in this regard?

[Answer] Figuratively speaking, many of our organizations are "growing their own bread" or, more precisely, their own vegetables and meat. Today the Stroymekhanizatsiya trust and the Gomelpromstroy construction association have the largest subsidiary farms. Hothouses with an area of 500-600 square meters and more have been built by an asphalt concrete plant and a plant producing facing tile from natural stone, both of which are subordinate to the Minskstroy Trust, by Trusts 19 and 21, and by others. Our construction workers have more than 1,500 hectares of land at their disposal. In 1984 they produced 109 tons of meat, more than 35 tons of milk and 40 tons of vegetables. These figures will increase with every year; in 1990 we plan to produce 910 tons of meat and 1,240 tons of vegetables.

[Question] And a final, traditional question: What are your plans?

[Answer] During the year the Ministry will be utilizing 1,215,000,000 rubles and will place 2,441,500 square meters of living area into use. We are practically finishing reconstruction of the Gomselmash agricultural machinery plant, which will make it possible to double production of combines for harvesting feed crops. We are building a nutrient yeast plant in Mozyr. In 1987 we will put it into operation. We are building the Mogilevselmash and Lidselmash plants and branches of the Minsk Gear Plant in Lopen and Smolevichi; we are expanding production areas at the Vitebsk

Tractor Spare Parts Plant and branches of the tractor and motor plants in Smorgon and Stolbtsy. Their activation at planned capacity will make it possible to considerably increase the labor productivity of agricultural workers, to reduce the prime cost of production and to speed up scientific and technical progress in rural areas. We are starting construction of a plant in Skidel for the production of lysin.

During the next five-year plan we will begin construction of still another state farm in the non-chernozem region. We will put up apartment buildings, kindergartens, schools, clubs, stores and hospitals at the republic's collective and state farms. In a word, there will be many construction projects in the countryside. We have grown indebted to the land. And, as they say, one good turn deserves another.

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AGRICULTURAL CONSTRUCTION

EDITORIAL OUTLINES MEANS TO HASTEN RURAL CONSTRUCTION

Moscow STROITELNAYA GAZETA in Russian 25 Oct 85 p 1

[Unsigned editorial: "The Reserves of Rural Construction"]

[Text] During the years of this five-year plan, construction workers have taken a significant step forward in developing the material and technical base of the agro-industrial complex and in the social reconstruction of the countryside. In the USSR Ministry of Rural Construction alone, more than 170 organizations and enterprises and more than 2,000 brigades have already met the goals of the five-year plan.

The achievements are indisputable. However, delays in activating agro-industrial complex projects still have not been overcome, the volume of uncompleted construction is being reduced only slowly and goals for increasing labor productivity are not being achieved.

Only a decisive turn onto the path of intensive development will help rural contracting organizations to overcome their shortcomings and to consolidate positive changes where they have appeared. We cannot move forward without this, especially considering the fact that, whereas the present five-year plan calls for an 8 percent increase in the volume of contract work within the USSR Ministry of Rural Construction, the 12th Five-Year Plan envisages an increase of more than 20 percent. As set forth in the decisions of the Party and government, it is necessary to transform rural construction into a unified industrial process and to introduce the achievements of scientific and technical progress both energetically and purposefully.

One of the most immediate reserves of rural construction workers lies in actively introducing the advanced experience which has been accumulated by the best collectives. Its range is sufficiently broad: It includes the application of modern technology, of improved ways of organizing and planning work and of effective systems of moral and material incentives. The good results being achieved by finished production brigades, which have an annual work volume of a million or more rubles and turn out projects "ready to go," are well known, for example.

The consolidated complex brigades of L. Kharsika from the Kazakh SSR Ministry of Rural Construction and of V. Kalmykov from the Fladimir TUS (not further identified) of the USSR Ministry of Construction have become the true masters

of their construction projects. Both the former, which contracts the construction of elevators, and the latter, which builds apartment buildings, have annual work volumes in excess of one million rubles and turn out finished projects for their contract customers. Labor productivity is considerably higher in consolidated complex brigades than in ordinary ones. More attention should be given to broadly disseminating the experience of such collectives. This is particularly pertinent to such republic ministries of rural construction as those in the RSFSR, the Ukraine, Tajikistan and Turkmenistan, where work carried out in this direction is weak.

Another way of cutting construction time periods is the use of light-metal construction elements shipped in complete sets from enterprises of the Ministry of Installation and Special Construction Work. For example, their use in building the Kindgskiy and Kaspskiy poultry factories in the Georgian SSR and the Novo-Bakinskiy factory in the Azerbaijan SSR, which have an annual capacity of 8.3 million broilers, has confirmed the high effectiveness of production-line assembly. For example, the Kindgskiy Poultry Factory was placed into operation a year earlier than planned. Progressive planning decisions made it possible to reduce by several times the number of poultry kept in fenced-in areas, to cut the labor-intensiveness of building each of them on the average by more than 35 percent and to increase labor productivity by 60 percent.

Definite experience in the use of light-metal construction elements delivered in complete sets has been accumulated within the rural construction ministries of the Azerbaijan SSR, the Kirgiz SSR and a number of other republics. However, dissemination of this experience is still weak, especially in the Ukrainian, Kazakhstan and Lithuanian ministries of rural construction. It is necessary right now, together with the contractors, to specify projects and amounts for the use of light-metal construction elements during the forthcoming five-year plan. Even more so, as the USSR Ministry of Rural Construction is planning to organize production at its own plants.

Development and improvement of the technical level of the industrial base are fundamental to accelerated scientific and technical progress in rural construction. More effective and fuller use of existing capacity is no less important. Worthy of note in this connection is the experience of the Belorussian SSR Ministry of Rural Construction, which is devoting intense attention to the development of its own industrial base -- to fulfilling plans for new equipment, to the introduction of progressive technology and to the economical expenditure of resources. For example, the indicator for assimilating new capacity in the manufacture of precast reinforced concrete is better in the Belorussian Ministry of Rural Construction than it is, on the average, for the all-union ministry. The capacity utilizaton level is also high for reinforced concrete plants in the Lithuanian SSR Ministry of Rural Construction.

However, this is not the case everywhere. In the non-chernozem zone of the RSFSR, production base capacities are being only 50-percent utilized in the construction of completely prefabricated housing. Activation of new production capacities is still at a low level in the Ukrainian, Uzbekistan and Kazakhstan ministries of rural construction.

Rural construction workers, contractors and agro-industrial association workers should study more closely the possibilities for applying the new organizational forms which are being utilized by a number of the collectives of the Rozkolkhozstroy construction association, the RSFSR Ministry of Rural Construction and the RSFSR Ministry of the Fruit and Vegetable Industry. For these collectives, the method of joint construction, based on the interaction of contracting methods and methods which rely on an organization's own resources, has become a powerful lever for increasing work volumes in the countryside.

Planning and scientific research institutes, contracting organizations and several agricultural combines under the RSFSR Ministry of Rural Construction are conducting an experiment in the use of stable prices for a square meter of living space. This economic investigation is aimed at reducing labor and material expenditures connected with developing and carrying out plans for rural housing construction by introducing the achievements of science and technology and leading experience. On an experimental basis, the Yaroslavselstroy rural construction association has implemented several proposals for reducing the estimated cost of building apartment houses. Labor costs were reduced by 778 man days while 14 tons of metal and 29 tons of cement were saved. The estimated cost of one square meter of living area was significantly reduced. The task now is to more quickly disseminate the results of the experiment and to prepare recommendations for the use of stable prices in mass construction.

Effective methods of studying and disseminating the experience of the best collectives have already been worked out in practice, among them model construction projects and organizations. Schools of advanced experience, seminars, councils of innovators and professional mastery competitions are extremely effective the expositions of the USSR Exhibition of National Economic Achievements are a veritable gold mine of advanced experience. Branch staffs -- the republic ministries of rural construction, the all-union ministry and republic associations of interkolkhoz construction organizations -- have a responsible role in propagandizing and introducing innovations.

Developing socialist competition to achieve a worthy greeting for the 27th CPSU Congress, rural construction workers have the important task of increasing the ranks of the leading collectives and of production innovators and of giving timely support to valuable initiatives.

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AGRICULTURAL CONSTRUCTION

BRIEFS

LITHUANIAN RURAL CONSTRUCTION--Personnel of the Lithuanian SSR Institute of Collective Farm Construction are making their own contribution to altering the appearance of the countryside. Plans for apartment buildings, cultural and personal services projects and rural social centers are being developed there. Moreover, each of these plans calls for a comprehensive approach to the problem of ensuring a maximum level of services for residents. In building living quarters, the institute is giving preference to the design of buildings using highly plant-finished prefabricated construction elements. This also shortens the time necessary to "turn over the keys" of the new homes. [Text] [Moscow STROITELNAYA GAZETA in Russian 1 Nov 85 p 3] 13032/12624

RURAL CONSTRUCTION SHORTCOMINGS--Many constructive collectives are not achieving their goals, are not meeting start-up schedules and are not being economical in their use of material and technical resources. Thus, components of the Ministry of Rural Construction are working on 225 projects. But how? The 9-month plan for putting them into operation has been only 32-percent achieved. Indeed, schedule breakdowns in placing projects into operation and changes in deadlines are fraught with great economic costs. Specialists have calculated that a ruble which is invested in construction and which lies idle for a year results in a loss of 15 kopecks. If we carefully examine the plans of components of this same USSR Ministry of Rural Construction and of other departments, we see that activation of a majority of their projects is put off until the fourth quarter or, more precisely, until December. And so, today, frantic work activity reigns at construction projects which are scheduled to go into operation this year. In this situation it is difficult to struggle for high work quality and for good working conditions. The ministries and departments along with local party, government and trade union organs should exercise more active influence on the introduction of the best experience at construction projects -- the Orlov system of uninterrupted planning, brigade economic accountability, the principle of the "working relay" and others. [Excerpts] [Moscow SELSKAYA ZHIZN in Russian 31 Oct 85 p 1] 13032/12624

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HOUSING CONSTRUCTION

SHORTAGES PLAGUE CONSTRUCTION MATERIALS TRADE IN LATVIA

Riga CINA in Latvian 23 Aug 85 p 2

[Article by V. Podnieks: "Construction Material Supply Line Becomes Easier"]

[Text] Last summer in "Cina" there was a particularly diverse discussion about single-family building construction and the possibilities of making it easier. More or less, all important problems were examined in the course of the discussion: projects, credit, construction material purchase and delivery to the construction site, building construction control and some other questions. The individual builders themselves and government employees, who take care of building construction problems, addressed "Cina" with their observations and opinions, evaluations and proposals.

The greatest response from other publications and readers dealt directly with construction materials, which often cannot be purchased in stores. If bricks arrive from Bolderaja, then they are of very poor quality. If the needed item is usable, and it is necessary to deliver it quickly to the construction site, then there is nothing with which to deliver. Cruising drivers take advantage of that and solicit bribes from the builders. Obtaining gravel is a frequent problem, and door and window blocks cannot be gotten for a long time, as well as many other things. Therefore, building construction often does not progress as it should; the beautiful vision of a pretty and pleasant homesite frequently is realized only after a long time.

The discussion had ended; however, letters still kept coming. For example, R. Treier informed, "There is a building material store in Salacgriva where one can order for construction and repair needs. But she has been waiting for cinder blocks for four months, and without hope as to when they can be gotten."

Finally she wrote in her letter, "I am not the only one who must suffer in order to get the needed materials. Perhaps your intervention will improve conditions?".

Letters sent by M. Kvilis from Erglis, V. Karaluns from Daugavpils region, E. Veldze from Cesis, and many other readers, expressed significant and honest personal interest for easier and smoother going single-family building construction in the future.

I. Opmanis from Valka region stated, "We the individual builders are very appreciative for the series of articles, "Family Builds A House." Only one question remains. When will the water begin to move? Let's hope for the best!"

The May 31st "Cina" article "Construction Material Acquisition to be Easier," which listed the new changes in retail trade, introduced on April 1st, and how they are put into practise in Ogres region, showed that "water started to move." However, construction material retail sales are only one part of the total diverse building construction field.

The Latvian SSR Council of Ministers examined the problems as a whole and adopted a resolution "Supplemental undertaking on peoples' request to ensure a construction material supply." Its short summary was published in the July 26th edition of "Cina." Readers' attention was captured, and they requested more comprehensive information.

The Council of Ministers acknowledged that in fulfilling the resolution adopted in 1983, providing single-family housing builidng construction with materials and fabrications, the supply improved a little. Last year's sales of wood products, bricks, slate, glass and some other building materials, when compared with the year before, grew by sixteen percent. Yet the demand still is not satisfied completely. Because specifically, there is not a sufficient amount of door and window blocks, flooring and siding boards, bricks, cinder blocks and many other manufactured items. The Construction Material Industry Ministry, Forestry Ministry, and Timber Industry Ministry did not live up to their obligations which were assigned by the signed agreements. Other shortages were also permitted.

In order to assure the peoples' needs for construction materials, and recognizing that the present situation cannot be permissible, legislation was adopted to accomplish additional undertakings; with the Latvian SSR National Planning Committee, National Technical Material Supply committee, respective ministries and departments assigned to achieve a radical change.

Construction material production increases and quality improvement must be secured. Expansion in retail trade, incluidng services in construction material shipment, loading and unloading at buyer's location, and also other tasks must be accomplished.

The national planning committee must see to it that this year an additional allotment is made of clay and silicate bricks, concrete and wall blocks for sale to people. The regional building material market funds must be increased in the next year to match retail trade organization requests. This supply of construction materials must be foreseen, considering seasonal needs. The needs of the people for these materials must be completely satisfied by 1988.

The construction material industry ministry has not accomplished its assignment for 1985 to set up the supply of loose construction material in small packages. This will be started in the first quarter of next year, anticipating

that in 1988 these construction materials will be available in 5 to 10 kilogram packaging (plaster - up to sixty percent, cement - up to twenty percent, lime - up to thirty percent), but dolomit and lime flour - up to fifty kilogram units, as requested by the retailers.

The retail outlets that sell construction materials should introduce additional services: glass and pipe cutting; sawing rough timber according to the buyer's measurements; wood plank and veneer cutting; and other conveniences. Store and warehouse policies should be changed so as to be convenient to customers. Strict requirements must be put forth to industry in order to ensure the supply of allotted wood products and building materials.

The question regarding sale to the people of additional local, non-ore-bearing materials (sand, stone chips, gravel, clay, stone) or topsoil and wood products, should be considered by the People's executive subcommittees in cities subordinated to republic and regional legislative bodies. It must be decided in the same way how all usable material, salvaged from torn-down housing, could be best included in supplying the people.

For a fee, the respective retailers must offer customers delivery services along with sales of construction materials, non-ore-bearing and other materials. Also, loading and unloading services must be offered when delivering these by truck.

Other undertakings are also foreseen to improve service for the people and to better satisfy their interests.

Without a doubt, most people wish that this resolution be put into practise quickly. One hopes that each responsible party accomplishes this task competently and with a sense of duty. Thousands of our republic's residents are waiting for that.

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CONSTRUCTION MACHINERY AND EQUIPMENT

NEW MACHINES NEEDED TO BOOST LABOR PRODUCTIVITY

Moscow STROITELNYYE I DOROZHNYYE MASHINY in Russian No 9, Sep 85 p 2

[Unattributed Report: "At the Ministry Conference of Party and Economic Leaders"]

[Excerpts] The Ministry of Construction, Roads and Municipal Machine Building has held a conference of party and economic activists to discuss the current objectives in the light of the decisions of the meeting of the Central Committee of the CPSU on accelerating scientific and technological progress in the industry. The activists' conference evaluated the work of organizations and enterprises subordinated to the ministry during the Eleventh Five-Year Plan and drafted the programs for the Twelfth Five-Year Plan, which involved eliminating the shortcomings that were noted and reshaping the operations on the basis of technological progress in the industry. According to preliminary estimates, during the Eleventh Five-Year Plan period the growth rate of productivity in the industry will exceed the rate of increase of wages, and the entire incremental industrial output will be attained through enhanced productivity; production costs will be reduced, contract-based deliveries will be raised to 98.6 percent and savings of material, power and labor resources will be achieved in accordance with plan targets.

New machines with better specifications are needed for a substantial improvement of productivity in industry and construction. The ministry envisions reducing the output of low-performance technology and is developing progressive systems of machine and equipment which make use of electronic components. This includes general-purpose basic underframe with a large set of interchangeable working components, construction loaders with a lifting capacity of 0.5-15 tons, tower cranes with lifting capacity of 12.5-25 tons with a modular design and cranes on trucks, pneumatic wheels and crawler tracks with a load capacity of 25-500 tons. The Odessa Industrial Factory imeni January Uprising is testing a crane with a lifting capacity of 250 tons on a special-design underframe. The Volgotsemmash industrial enterprise has begun serial production of diesel-electric crawler-based cranes with capacities of 63 and 100 tons. As early as in 1986, excavators with bucket capacity of 1.6 m^3 will be manufactured in numbers nearly filling the industry's needs. The output of pipe layers with load-carrying capacity of 50 tons on TT-330 tractors will be increased, the manufacturing will be initiated of cranes on short underframes with lifting capacities of 25 and 40 tons whose production

prototypes have passed acceptance tests, and more agitator trucks will be produced. For water utility construction, the output will be increased of no-ditch drain layers MD-12, featuring a productivity of 1.5 times that of the discontinued MD-4 and MD-5; more high-power rotor excavators ETR-208 will be manufactured. The production of equipment for the cement industry will also be expanded. The production will be started of sets of general-purpose hydraulic manipulators for the timber industry; more loader-transporters LT-175, mobile pruning machines LP-33, timber-piling machines and self-unloading chip trucks will be manufactured. Major effort will be invested in improving the quality and increasing the output of hand-held tools and building-finishing machines, since currently the construction ministries' requirement for power tools and small-scale mechanization equipment are met only to 50 or 60 percent.

The speakers at the meeting leveled just criticism at the industry's leading research institute, the All-Union Scientific Research Institute of Construction and Road Machines [VNIIstroydormash], for the fact that some of the machines designed by its engineers are power- and metal-intensive and have design flaws, shortcomings and low performance characteristics.

Developing and putting into production groups of machines carrying out operation sequences and securing a manifold productivity increase have been advanced as a major priority goal. For example, the All-Union Scientific Research Institute of Ground-Digging Machines [VNIIzemmash] has developed, on the basis of a common traction module, a general-purpose crawler-based underframe with a train of working equipment for trench digging and lining, drain laying and other operations; this has greatly improved productivity. A family of multi-functional electric tools has been developed by the staff of the All-Union Scientific Research and Development Institute of Mechanized and Hand-Held Construction Tools, Vibrators and Building-Finishing Machines [VNIISMI].

For the Twelfth Five-Year Plan period, the industry is faced with formidable goals, and meeting them will require restructuring the management, including the reorganization of the central agencies of the ministry, all-union production associations and scientific research organizations, and the transition to a two-level system of subordination of enterprises and organizations in the industry.

Starting from 1 Jan 1986, the ministry will be operating according to the principles of large-scale economic experiment; it is imperative to be well prepared for the change by planning all operations in advance and coordinating them within a common economic mechanism. In doing so, one should draw on the useful practical experiences accumulated by the Moscow Machine Building Works imeni M. I. Kalinin, where the operation according to the principles of large-scale economic experiment is currently in its second year.

The speakers highlighted the major aspects of the industry's activities and submitted proposals for meeting the targets of the last year of the Eleventh

Five-Year Plan, providing the conditions for successful operation under the Twelfth Five-Year Plan and fulfilling extra socialist production commitments as a way of properly welcoming the 27th Congress of the CPSU.

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CONSTRUCTION MACHINERY AND EQUIPMENT

TRANSPORT SYSTEMS FOR LARGE, HEAVY STRUCTURES VIEWED

Moscow MEKHANIZATSIYA STROITELSTVA in Russian No 6, Jun 85 pp 13-15

[Article by G.A. Rastorguyev, cand. tech. sci. (SibNIIgazstroy) and Engineer G.V. Zinovyev (Sibkomplektmontazh Association) under the heading "Improve and Make Wider Use of the Complete Unit Construction Method": "Transportation and Installation of Large, Heavy Structures in the Conditions of Western Siberia"]

[Text] In terms of their functional significance, the subsystems for the transportation and installation of large elements are the decisive factors in the overall system of unit construction. The quality and the period for introduction of ground installations on the main pipelines depends on their organizational-technical reliability. The dimensions of the large components are twice or three times as large, and the mass is of an order of magnitude greater than that of ordinary unit installations (bay units). In this connection questions of mechanization of the transportation and installation of large, heavy units are very timely.

The motor vehicle industry is still not meeting the country's needs for means of transportation to haul large, heavy loads, neither in terms of quantity nor quality. For example, the Chelyabinsk machine-building plant for truck trailers makes but two 150-ton capacity ChMZA8 heavy-load trailers per year. Incidentally, there are already examples of how such trailers are utilized in combination with self-propelled vehicles, which significantly enhances their towing characteristics. Concerning the use of lighter-than-air vehicles as a means of transportation--dirigibles and balloons--for the time being they are far from being of practical use, in terms of their level of development. Various planning and scientific organizations at many departments are engaged in planning and manufacturing special means of ground transportation. Those of which have reached the stage of working designs or practical use are worthy of mention.

VNIImontazhspetsstroy [All-union Scientific Research Institute for Installation and Special Construction Works] has developed a gamut of motor transport equipment (MTE) on pneumatic rollers, with carrying capacities of 80, 150, 250 and 600 tons. These mechanisms consist of two roller trolleys, the connecting link between which is the load itself. They are being used in the European part of the country for hauling columnar-type equipment along hard-surface roads.

Giprotyumenneftegaz [Tyumen Oil and Gas Administration State Planning Institute] has worked out a technical task for transport equipment (TE) of the MTE type, in which pneumatic rollers are substituted for caterpillar tracks in the running gear and bracing struts are provided for shoring up large components. The carrying capacity of this TE is 450 tons; its suffix is GTS-450A. Working drawings were developed by the PKB [Planning and Design Bureau] of the South Urals Transportation Administration. A working model has not yet been made.

Within Minneftegazstroy [Ministry of Construction of Petroleum and Gas Industry Enterprises], the Sibkomplektmontazh [Siberian Assembly-Installation Association], the SPKB [Special Plannikng and Design Bureau] of Proektneftegazspetsmontazh [Planning Office of the Glavneftemontazh [[Main Administration for Installation of Petroleum-Processing and Petroleum-Producing Establishments, RSFSR]] of the RSFSR Ministry of Construction], and SibNIPIgazstroy [probably Siberian Scientific Research and Planning Institute for Gas Pipeline Construction] are occupied with the questions of transporting large, heavy components. Technical-economic research carried out by SibNIPIgazstroy shows that for the far-flung construction regions of Western Siberia with its poor lines of transportation, it is necessary to create TE which places the least severe demands on the load-bearing part of the roads, bridges and crossings. Such indicators as speed of delivery, the cost of a set of equipment, and operating expenses do not have an important influence on the transportation expenses quoted. This is explained by the fact that in the European part of the country, estimates of expenditures quoted for transporting large and heavy loads includes road maintenance, in the form of expenses for upkeep and strengthening of the load-bearing part of already-existing lines of transportation. In the conditions of Western Siberia, lines of transportation are built fresh, and are suitable only for the transportation of construction loads. In the given situation, they are for the delivery of large units and other construction loads which are not part of complete-unit construction loads. Therefore, the organizations of Minneftegazstroy are developing TE based on the conditions of transferring the smallest possible travelling load.

The 350-ton capacity UTSh-350 walking gear was developed by the Proektneftegazspetsmontazh SPKB. The engineering solution was based on the well-known principle of alternately shifting the bedplates--the base and the load-bearing platform, relative to one another. The specific pressure on the ground is equal to the load created by heavy pipe-laying machines (no more than 0.1 MPa [probably Megapascal]).

At SibNIPIgazstroy, work is under way on for creating a means of transportation and hauling based on the pneumatic-roller principle. At the first stage, an experimental model of a pneumatic-roller unit has been built, the KP-300, with a load-bearing capacity of 300 tons (Project supervisor is engineer V.D. Beloglazov). This unit is intended for transportation and hauling operations at construction sites, and for launching and retrieving large units from the water.

The unit consists of 40 pneumatic rollers, turning rods, a control panel, and a transportable compressor. The basic load-bearing and propulsion element of the unit is the pneumatic roller, which consists of casings and

a device for inflating and deflating the rollers. The All-Union Scientific Research and Technological Designing Institute of the Rubber Industry (VNIKTIRP) developed the design of a rubber-cord chamberless casing according to a technical assignment from SibNIPIgazstroy; the manufacturer is the Volga Industrial Rubber Articles (RTI) Plant. The wholesale price of a single pneumatic casing is 2,200 rubles. The lack of chambers permits collapsing the casing by means of a vacuum, which permits easy insertion of the pneumatic rollers under the unit, and subsequently inflating them. The reduced rigidity of the pneumatic rollers, as compared with the chambered fenders produced by the Kursk RTI Plant permits lowering the route requirement. The chamberless pneumatic casing increases the operating reliability (the lack of punctures). The pneumatic rollers are connected to one another on a section of turning telescoping rods with regulated length. Inflation and deflation in the chamber is accomplished through a system of air lines of the ZIF-55 transportable compressor.

Technical Characteristics of the KP-300 Pneumatic Roller Unit

Payload, tons	300
Diameter of Pneumatic Roller Without Load, meters	1
Length of Pneumatic Roller, meters	2.9
Allowable Load on one Pneumatic Roller, tons:	
Working	15
Maximum	22
Internal Working Pressure, MPa [Megapascal]	0.1-0.2
Allowable Maximum Radial Compressability, percent	50
Mass of One Pneumatic Roller, kg	50
Cost (Approximate) of Unit, thousands of rubles	52

The technology of transportation and transshipment using pneumatic rollers is as follows: The pneumatic rollers are inserted under a unit of large dimensions, which is standing on load supports. As the pneumatic rollers are inflated with air, they lift up the unit. Using a tractor and winches or other towing mechanisms, the unit on pneumatic rollers is moved to the place where it is to be set up or installed. The pneumatic rollers, having been removed from beneath the unit, are laid out on a new path along the line of movement. When changing the direction of movement, the pneumatic rollers are positioned at an angle to the axis of the unit being moved. When the unit is put down on the foundation mat, the air is released from the pneumatic rollers and the unit is lowered onto the foundation mat. The mass of the unit being installed is practically unlimited and depends on the number of pneumatic rollers under the unit at one time. The technology for lowering and raising units of large dimensions from the water is somewhat different from that described.

At the present time, intradepartmental acceptance tests of an experimental model of a set of pneumatic rollers have been completed in the Middle Ob region. There the set was used to lift from the water (fig. 1), deliver to the building site, and set up on the foundation, four large boiler units. The individual units weighed 180 and 240 tons. The units were moved along the route butt-jointed in pairs (Total weight of the two joined units was 420 tons). After acceptance tests, the model of the pneumatic roller unit was sent to the Sibkomplektmontazh Association for experimental-industrial operation.

This association is assimilating a program for creating a means of transport for large units by using air-cushion (VP [vozdushnaya podushka]) vehicles. The principal advantage of this type of transport is that it is amphibuous: it can pass over a surface with any kind of load-bearing ability, to include water, snow, ice, etc.; it requires little effort for towing; and, the load factors for the load in transit are low. The degree of realization of the advantages cited is determined by the parameters and design peculiarities of the load in transit and the means employed for the VP. Analysis shows (and this was confirmed both by native and foreign experience) that for hauling large units with a weight of up to 200-250 tons platforms may be used on the VP's (PVP). The principle component design for such platforms is a supporting welded steel body in the form of a rectangular pontoon on which expanders of lightweight construction are fastened along the sides: one or two power units with fans are installed on the supporting body, with a cabin on one of the units. The flexible enclosure of the VP, made from rubber-impregnated nylon fabric, is hung along the perimeter of the platform on the edges of the expanders and the sides of the supporting body. The elements of the body and the platform assembly are as a rule made to the dimensions of railroad gauge. At the present time, non-self-propelled VP platforms with load capacities of 25, 40 and 60 tons have undergone experimental operational testing.

The results of operation of PVP-20 and PVP-40 platforms in the regions of the city of Urenga, the settlement of Tazovskiy, the city of Nefteugansk, and the settlement of Sorum show that in those places where transfer of components of unit construction by traditional means of transport is difficult or altogether impossible, special means of VP transport can be successfully used (fig 2). Loading and unloading boiler units or bay units for various purposes, where load lifting facilities were not available, was accomplished by the method of suspending the load from a trestle or with the use of a ramp on the platform.

In order to transfer units weighing 200 tons or more individually, it is sensible to make use of the suspension unit of the VP equipment (UVP), which consists basically of the very same elements as the platform, but the role of the supporting framework is fulfilled by the unit being transferred, and the elements of the UVP are suspended on the unit. At the same time, the unit being prepared for shipment with the use of the UVP must be fitted out with assemblies on which the VP can be mounted and the center of gravity must be calculated. An experimental model of a 300-ton capacity device has been developed, the UVP-300. Presently an experimental model has been manufactured and approved for transportation of the PPK-50 boiler (fig 3).

In order to ship units with different dimension and mass characteristics, the UVP-300 must be modified appropriately. The creation of an experimental model of the UVP-300 was preceded by experimental work for delivering a compressed air pumping station (DNS [dozhimnaya nasosnaya stantsiya]) with the use of UVP-400 equipment. In connection with the fact that the unit had not been previously intended for transportation by air-cushion vehicle, additional hermetical sealing was accomplished, temporary platforms were installed to the shape of the estimated form and area of the VP according to

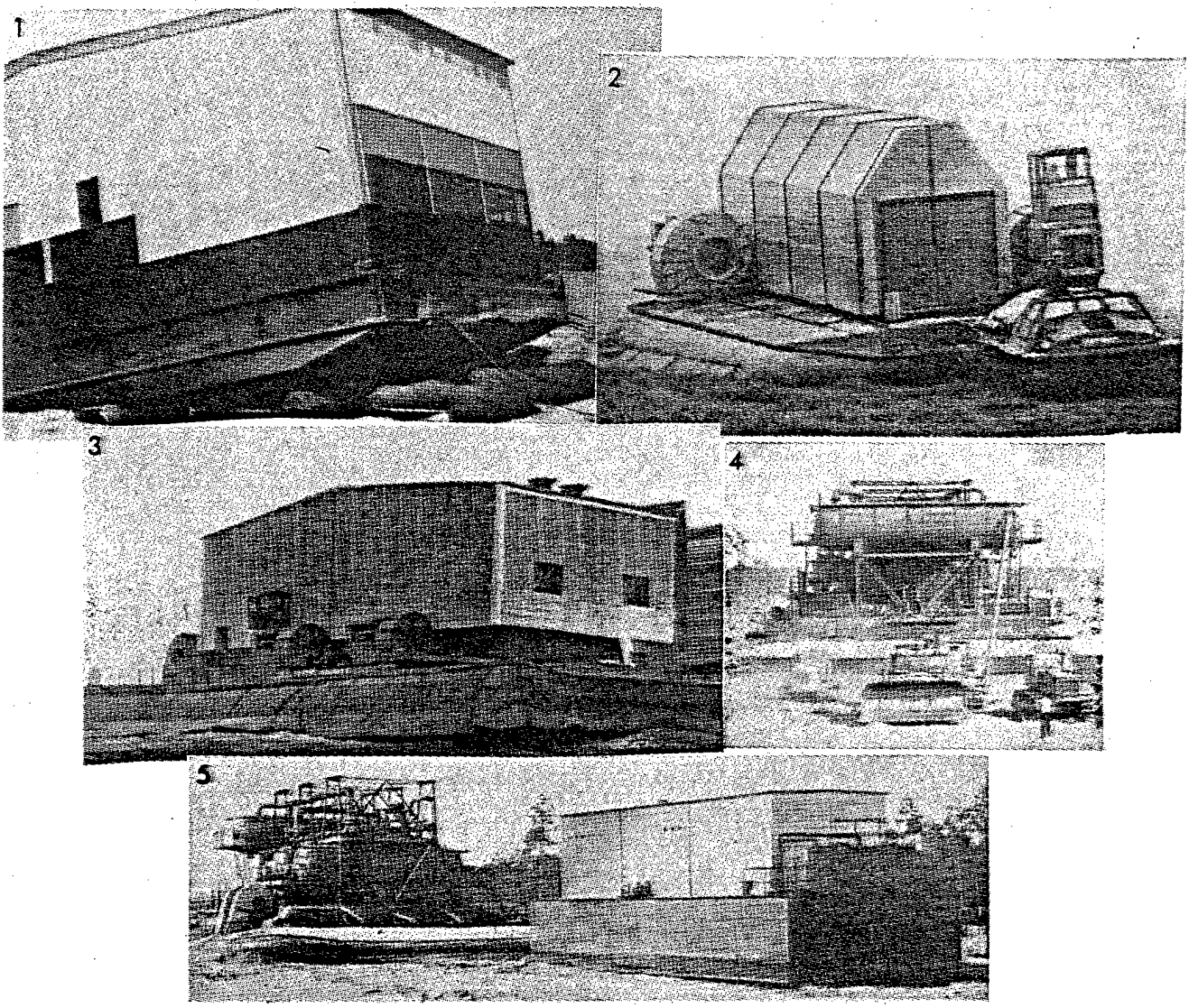
the plan; consoles were installed under the power blower units, and components were installed to strengthen the expanders on the flexible enclosure of the VP. Together with the UVP-400 unit (which weights 27 tons), the DNS unit weighed 450 tons. In order to pass under the railroad bridge across the Ob, parts which protruded above the height limit were removed, and the 370-400 ton unit was towed to a distance of 100 km down the Ob, and then 100 km up the Pim River--which is not navigable--to the settlement of Lyantor, where the unit was brought ashore, moved across the dry land, and installed on its foundation (fig 4).

Along with the experimental testing of the peculiarities of transporting large units by using air-cushion vehicles, and testing the operating capability of the UVP-400 unit, it was proven possible to move such objects along non-navigable rivers, which do not permit the use of other well-known means and methods of delivery. During transportation of the DNS unit, the possibility was proven for moving a system of units by means of combined use of an air-cushioned vehicle and portage. In this manner, first the DNS component, partially removed from the air cushion, was towed for several meters, and then while the VP was turned off, and using the DNS unit as an anchor, the lighter component of the pumping station was pulled with block and tackle by portage (fig 5). Such a method of combined towing solves many problems of supplying the necessary tractive force.

A work program is planned to seek out the engineering solutions for reducing the route requirements both in terms of the topography and preparation of the surface, and which would provide for lifting the components onto the bank, where there are no facilities ashore. Research must be carried out on questions of increasing the capability to install equipment on air cushion vehicles; on their repairability; on providing the required thrust in conditions of complex topography and poor soil; and on reducing the dimensions for transportation.

Work is underway at Sibkomplektmontazh to create an UVP-1000 for tranporting large units weighing 1,000 tons. Individual elements of the device are being optimized on a scale model. An experimental large-size unit weighing 1,000 tons is in the manufacturing stage. The unit is intended for moving a repair and mechanical workshop. The dimensions of the unit with the VP are 65.9 x 24.3 x 11.6 meters.

Thus, for transportation and shipping work with large, heavy units in the conditions of Western Siberia, it is technically and economically expedient to make use of means which employ the principle of pneumostatic compensation for the force of the weight of the load being moved.



1. Raising a large unit weighing 240 tons from the water with the use of a KP-300 pneumatic roller unit.
2. Transportation of a 30-ton unit on the PVP-40 non-self-propelled platform.
3. Air cushion vehicle equipment mounted on the pontoon of a boiler unit.
4. Delivering a unit of an UVP-400 air compressor station.
5. Combined towing of two large units.

9006
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ADVANTAGES, USES OF LASERS IN CONSTRUCTION WORK

Moscow NA STROYKAKH ROSSII in Russian No 8, Aug 85 pp 56-57

[Article by Engineer A. Oganesov: "The PZL [Laser Zenith Instrument] Automated Precision Instrument Needs the PL-1 Laser Attachment"]

[Text] Geodesic support by means of laser instruments for construction work consists in using the laser's beam for correctly installing constructional-structure members, checking elevator shafts, and recording accurately the installation of freestanding high-rise and mast-type structures.

The use of laser radiation of vertical design in construction operations has the following advantages over traditional methods:

the assembly or erection of the structure of buildings and structures is checked continuously and directly at the site of operations;

the repeated checking of structure and members is precluded;

only one performer participates in the operation instead of two; and

the work can be done at any time of day and in any kind of weather.

The PL-1 laser attachment is installed for joint use with the N-3 level as an engineering instrument that defines the direction of the laser's radiation. Its use with the automated PZL precision instrument enables the vertical extension of reference points to be made for a variety of purposes by laser radiation with a precision of ± 5 mm during the construction of structures where the height of sighting is as much as 100 meters.

The laser radiation passes through the eyepiece and goes into the optical system of the PZL instrument, the vertical line of sight of which is stabilized by means of a pendulum. Thus, the laser beam is not distorted and passes through the instrument as a guiding line-of-sight optical beam, while the diameter of the laser beam is focused by means of a special screw.

The PL-1 laser attachment is fastened to the PZL instrument by an adapter (an adapter ring) in such a way that the laser tube's radiation falls onto the instrument's eyepiece and leaves the objective in the form of a beam, whose brightness, focus and diameter are adjusted by the PZL instrument's focusing projection.

In operation, the instrument is installed in direct proximity to the structure being monitored (or erected) and it is fixed strictly horizontally in accordance with the levels on the PZL instrument.

The measured value of "x" is easily monitored during the erection process and during verification--at any point and for any height--in accordance with the projection of the light image of the laser radiation.

The measuring rule (gauge) by which the amount of the structure's vertical deflection is determined is applied to the points a, b and c....

Trust No 16 of Glavleningradstroy [Main Administration for Housing, Nonindustrial and Industrial Construction under the Leningrad City Ispolkom] introduced the PL-1 attachment together with the PZL (called the LZP--laser zenith instrument) during the erection of nine elevator shafts at facilities under construction.

The laying of the shafts' bricks, from the pit to the top, was constantly monitored by the laser attachment and, in the necessary cases, the bricklayer received current data about the quality of his work performance.

Upon conclusion of the masonry work, a performance-monitoring survey of the wall's verticality was made. The maximum deviation for all nine shafts did not exceed +15 mm.

It is proposed to use a cylindrical prism, which will be attached to the PZL instrument's objective, for more effective use of laser radiation when checking elevator shafts. In this case, a precise image of the laser radiation is returned in a straight line.

An adapter member with the cylindrical prism will make the attachment universal, enabling the height and verticality of elevator shafts to be measured. Moreover, when using the adapter member, the geodesist's constant attendance at the instrument is not required--he adjusts it once prior to the start of the work and then it can be operated by a nonspecialist.

Additional data can be requested from: 191065, Leningrad, Naberezhnaya p. Moyki, 67/69, Trest No 16 Glavleningradstroy.

11409
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CONSTRUCTION METHODS AND MATERIALS

BOOK REVIEWED ON PRODUCTION, USE OF CEMENT IN CONSTRUCTION

Moscow ZHILISHCHNOYE STROITELSTVO in Russian No 10, Oct 85 pp 31-32

[Review by Engineer V. P. Savenkov of book, "Ekonomiya tsementa v stroitelstve" [Saving Cement During Construction], by Z. B. Entin, V. Kh. Khomich, L. K. Ryzhov et al and edited by Z. B. Entin, Moscow, Stroyizdat, 1985, 222 pages, with illustrations]

[Text] One of the important national economic tasks is that of saving cement during construction. The new Stroyizdat-published book is dedicated to examining the sources of losses and overconsumption of cement and methods for improving cement quality and to generalizing the advanced experience of cement-industry enterprises. The authors paid their main attention in the book to improving operating processes and to monitoring the production and use of cement.

The first two chapters of this revised edition focuses on questions of the efficient and economical production of cement and of the control of product quality at cement plants. The authors note that the cement varieties that the country produces should correspond as much as possible to the variety of concretes and mortars and that the types and grades of cement should be used strictly in accordance with their intended purpose.

The third chapter is devoted to standardization tasks and to the technical level of the standards. The fourth and fifth chapters examine the problems of organizing the distribution and delivery of cement and the setting of norms therefor. In particular, the need to correlate plans for cement production and the plans of the capital-construction branches which consume the cement with the plans for supplying them with materials and equipment at minimum distribution costs is pointed out. It is noted that, from the engineering point of view, the restriction on the amount of cement stone in the concrete has in most cases a positive influence on the concrete's construction-engineering properties, primarily its strength, deformability and durability.

The sixth chapter, the most important one in terms of the volume and number of tables and charts, gives generalized information about the ways of making economical use of cement when producing prefabricated reinforced-concrete parts and structure. It examines the basic engineering functions which determine the consumption of cement in concrete, rational use of the variety of cements produced, and the use of effective additives and good-quality

aggregates. The information that this chapter contains on optimizing the constituents of concrete and on improving operating processes, equipment and methods for monitoring the quality of the concrete is indisputably of definite interest to construction-industry workers. Questions about consuming cement economically when making structure from lightweight materials are examined thoroughly.

The seventh chapter elucidates the experience of construction-industry enterprises of Glavmospromstroymaterialy [Main Administration for the Building-Materials and Constructional-Parts Industry of the Moscow City Soviet of People's Deputies] in expending cement economically. Each year they consume 2 million tons of cement. Given such a large amount of cement used, measures taken to save are yielding appreciable results. It is noted that the use of various chemical additives--for plasticizing, air entrainment and quick hardening--save much cement.

The last two chapters are dedicated to questions of automating concrete-mix production and of heat treating the concrete, to the improvement of operating processes, and to monitoring output by using the methods of mathematical statistics. Methods for evaluating the quality of control of the operating units are cited, and the control of rotating kilns and cement grinders at the cement plant is analyzed.

It should be noted that this book is of great practical importance primarily for specialists at plants that prefabricate reinforced concrete, and that it extends necessary assistance to builders in the matter of consuming cement economically and rationally. This edition's modernity is confirmed by its overall guidance on saving all types of supply and equipment resources.

The book as a whole undoubtedly deserves approval, since it is a useful aid to construction organization workers.

11409
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CONSTRUCTION METHODS & MATERIALS

AUTOMATION LAGS IN BELORUSSIAN CEMENT, CONSTRUCTION INDUSTRIES

Moscow, MEKHANIZATSIYA STROITELSTVA in Russian No 11, Nov 85 pp 9-11

[Article by S.S. Atayev[1], under the heading "Accelerate Scientific-Technical Progress"; Belorussia: On the Basis of Programmed-Special Purpose Methods of Managing STP": "Reserves for Intensification and the role of the STS"]

[Text] At the CPSU Central Committee meeting held 11-12 June 1985, the need was stressed for further increasing production effectiveness on the basis of accelerating scientific-technical progress and putting all existing reserves into operation. Guided by this strategic party policy, the construction workers of Belorussia are actively working on increasing the effectiveness of all links of the construction industry. The scientific-technical society [STS] for construction has a significant role to play in this great creative work.

The republic STS for the construction industry, which includes more than 60,000 specialists, is for all practical purposes in charge of scientific-technical progress [STP] in the branch.

Increasing construction effectiveness in the republic is being accomplished on the basis of programmed-special purpose methods of managing technical progress. It is namely for this reason that the STS consisiders its main task to be participation in a most active manner in the development and subsequent realization of scientific-technical programs.

Thus, our society is taking an active part in developing and implementing the comprehensive scientific-technical program, "Increasing the Organizational and Technical Level and the Growth of Labor Productivity in Construction for the 11th Five Year Plan." Mechanization and automation of construction processes are given a prominent position in the program.

In accordance with this program, during the four years of the current five-year plan, more than 3,800 units of efficient means of mechanization have been produced in the republic: 2,000 at the enterprises of the construction ministries and departments, and more than 1,800 at the republic's machine-building plants. Also manufactured were nearly 2,100 standard sets and over 60,000 tools, rigs and devices. In the 12th Five-Year Plan these tasks will be expanded.

[1] Prof. S.S. Atayev, a doctor of technical sciences, is an Honored Figure of Science and Technology in the BSSR, an Honored Builder of the Republic, and is board chairman of the Belorussian Construction Industry STS.

A steady course has been set in the republic for manufacturing the means of mechanization, including a number of construction machines built with our own resources. In our view it would be improper in principle to expect that these machines would at some time be supplied by the enterprises of the USSR Minstroydormash [Ministry of Construction, Road and Municipal Machine Building], although this ministry is in general supposed to supply machinery to the branch. After all it's no secret that the state of equipment and the total capacity of the metal-working capacities of the country's construction ministries is very nearly equal to that of the state of equipment and capacities of the enterprises of the construction, road and municipal machine building industry. And therefore it is no accident that for a long time almost all the country's construction ministries have been trying to bridge the gap in the problem of supplying modern construction machinery, by manufacturing at their own enterprises the installation cranes, automatic concrete mixers, automatic concrete pumps, load-handling equipment, heavy-load trailers, and other no less complex machinery.

Such a practice--orienting on one's own reserves and capabilities--has been successfully implemented in the republic. Here replacements to the pool of machinery are made basically by virtue of the production of the repair and mechanical shops of the construction ministries and departments, and by enlisting for this task the machine-building enterprises of other branches situated on the territory of the republic. This method has the active support of the Belorussian Communist Party Central Committee and the republic Council of Ministers.

As the result of implementing a complex of technical measures, including mechanization--an important factor of intensification of construction production--during the years 1981-1984 the republic ministries and departments have arranged to free 26,400 people for other tasks: 8,150 of these, or more than 30 percent, by virtue of the mechanization factor. And it is no coincidence that on the whole throughout the republic's construction complex, the 11th Five Year Plan task for growth of labor labor productivity has been fulfilled for four years.

In spite of these partial successes the situation with respect to reduction of manual labor in the republic's construction work is for the time being unfavorable. In recent decades a unique state of affairs has taken shape in the branch in which factors which had been effective in the past such as intensification of construction, mechanization (in its traditional form), and fabrication, which had achieved a certain level of development and had stabilized at that level, are no longer rendering such decisive influence as they had in preceding years on growth of labor productivity--which is the most important and perhaps the most realistic indicator of effectiveness. And is this not a paradox--that in spite of high accounting indicators for the level of mechanization, and almost peak levels of fabrication (with the extremely crude method of calculating them which currently obtains), labor expenditures in construction are still unjustifiably high.

It is currently becoming increasingly obvious that fundamental improvements in matters in this direction demand principally new, non-traditional approaches to improving the mechanization of construction processes--approaches which take into consideration the typological and technological development of construction and the new capabilities which would be brought to the branch by scientific-technical achievements in the realm of machine-building, electronics, chemistry and other fundamental sciences. Practical experience has shown that only such a comprehensive approach to perfecting the means and methods of mechanization can provide a real, tangible effect.

Take for example the problem of mechanization of concrete work, where the output in the majority of the country's construction organizations is one-half to one-third of the ordinary output of a number of foreign firms and progressive native builders. This unacceptable incongruence is explained to a significant degree by the fact that work on improving the mechanization of concrete work is carried on as a rule without accounting for the entire complex of factors which influence its effectiveness.

For example, in recent years, construction organizations have begun to acquire increasing numbers of automatic concrete pumps, and have been outfitted with hoisting booms--extremely promising and highly-productive machinery, which solves the problem of delivery and distribution of the concrete mixture on a new technical level.

Unfortunately, however, the pool of automatic concrete pumps--which is still rather small--is utilized in an extremely irrational manner: at no more than 10 or 20 percent capacity, and the basic technological advantages of the automatic concrete pumps such as mobility are practically unrealized. The fact of the matter is that automatic concrete pumps operate reliably only when the entire technological chain of events is normalized--starting with the concrete manufacturing plant, which is expected to prepare high-quality concrete mixes; the use of concrete-mixer trucks for delivery of the mix, or on-site transfer-mixing machinery; and preparing the necessary field of operations--and ending with the use of the proper concrete forms.

In this connection it is appropriate to note the fact that, beginning with the 11th Five Year Plan, a special-purpose scientific-technical program called "Monolit-11" has been functioning in the republic Minpromstroy [Ministry of Industrial Construction], Minselstroy [Ministry of Rural Construction] and Belmezhkolkhozstroy [Belorussian Inter-Kolkhoz Construction Organization]. Within this program, an entire complex of measures directed toward increasing the effectiveness of mechanization of concrete work is being implemented.

Among other tasks in the program, the task has been set for improving the utilization of concrete pumps. Specifically, it is planned to improve the ease of operation of pumping the concrete mixtures, to include the porousity of the aggregate; and, to completely mechanize all manufacturing steps, from preparing the mixture to pouring it, and creating a system of concrete forms which are easy to assemble and which are capable of supporting significant loads (10-12 tons of force per square meter and more) which arise as a result a result of adopting ductile concrete mixtures and high rates of pouring them into the forms.

In the 12th Five Year Plan it is planned to significantly increase the production of concrete pumps of native manufacture, to include automatic concrete pumps equipped with hoisting booms. One can confidently predict that such concrete pumps will in the very near future become a permanent technological link in the production of concrete work. Their significance lies not only in their high productivity and mobility, which is of itself very important, but in the fact that the use of these machines will require sharply-increased demands for technological discipline in the entire process of making concrete. Thus, the task for fundamentally improving the operation of these highly efficient machines is a technological task of primary importance which must undoubtedly find its place in the programs of the research, engineering and construction organizations which are taking part in solving the problem of increasing the effectiveness of concrete work.

An important task for the engineers is reducing the labor intensiveness of plastering work. In recent years significant steps have been taken in this direction. New types of plastering stations have appeared, methods of mechanizing the individual operations are being improved, and so on. At the same time the level of mechanization of plastering work has risen to 70-80 percent. Nevertheless, the plastering process remains one of the most labor-intensive of the construction processes.

The fact of the matter is that in the given situation the efforts of the developers are ordinarily directed toward mechanization of separate operations without serious attempts to make fundamental improvements in the very essense of the technological process.

A new mechanized technology for putting up thermal-insulating plaster coatings has been developed by specialists from BelNIIOUS [Belorussian Scientific Research Institute for the Organization of Management in Construction], BSSR Gosstroy, and the Minskstroy Combine of BSSR Promstroy, with the active cooperation of the mechanization section of the Belorussian board of the STS for the construction industry.

Unlike the traditional multi-operation technology for plaster work, a principally new method has been proposed, in which the plaster mix is forced into the space between the wall surface and stock panels. In this manner the number of operations is reduced from ten to three. The use of new technology ensures growth of labor productivity by a factor of 1.5 for finishing work on the wall surface, and by a factor of two for finishing the corners; in addition (in accordance with SNiP [Construction Norms and Rules] 11-3-79) the new method permits savings of 50 red bricks or 100 silicate bricks, and 13 kg of standard fuel per square meter of surface area.

It was possible to achieve this result only because of the fact that instead of attempts to mechanize certain of the traditional operations in the plastering process, the engineers relied on a principally-new, simplified mechanized technology.

If the problems of mechanization are examined in close association with other aspects of industrialization, one must then take note of the fact that the branch still clearly underestimates the significance of so-called "minor mechanization," or to put it another way, the industrialization of the

construction processes. It is not only a question of the need to expand the use of the means of minor mechanization and of better-quality mechanized and ordinary hand tools, but one of broad use of technology in assembly work in conjunction with construction and stock materials; of a variety of quick-release fastening devices, small jigs and other gadgets which permit significant reductions in manual labor at the building site, raising it to the qualitative level of operations which obtains in industry.

A careful analysis made in the republic of the peculiar features of construction at the Belorussian Metallurgical Plant showed that a comparatively low level of labor-intensiveness in construction and installation operations was achieved not only as the result of careful organization of operations, effective use of construction machinery and the use of designs with a high degree of prefabrication at the plant; to a significant degree it was due to the wide use of a variety of the simplest standard appliances, which permits sharply reducing expenditure of manual labor, raising its productivity, and guaranteeing high quality. This experience must be spread throughout the country as much as possible. And whereas gaps in the use of efficient means of mechanization can still somehow be explained by shortages, failure to make use of this easily-accessible reserve for intensification of construction production cannot be justified in any way.

On the way to intensification of construction, the problem of automation of construction processes inevitably arises; that is, the gradual transition from human control to machine control. Significant steps have already been undertaken in this direction at construction industry enterprises, where the manufacturing processes are relatively stable and standardized and consequently more adaptable for automation.

Far less has been done on automation of construction processes at the building site. For the time being one can speak seriously only of partial automation of the preparation of concrete and plaster mixes, and the very insignificant use of various kinds of automatic limiters on construction machinery, automatically-positioned operating assemblies on leveling and certain earth-moving machinery, and additionally, of certain automatic devices which have not yet been introduced in any numbers. Thus, there is a wide field of activities here.

In consideration of the above, a special construction automation section was established this year at the Belorussian board of the STS for the construction industry; it was given the assignment of supporting useful initiatives in this sphere in every way.

Among the projects accomplished in the republic for automating construction processes, one can single out the creation of an original automated control complex for preparing concrete and mortar mixes (KAUPS-2), which operates on serial microprocessor technology. This complex was developed by specialists at the BelNIIOUS of BSSR Gosstroy, Minpromstroy, and Minselstroy.

This complex provides the capability to prepare up to 100 mixture formulae under automated conditions, and permits adjusting the formula for moisture content, registering material expenditures, and diagnosing equipment failures. Use of this complex permits savings of cement of up to 3 percent.

Also under the purview of the automation section will be the work begun in the republic on robotization of construction processes. Whereas there are already serious demands for robotization of certain stages in the industrial processes at construction industry enterprises, merely posing the question of creating robots for building processes sometimes raises certain doubts among specialists. However, doubts or no doubts, it is necessary to begin active consideration of the robotization of building processes right away, or time will be wasted.

Obviously, today one can already set about the practical task of robotization of such relatively stable building processes as putting up plaster or painting, controlling cement-mixing, laying floors, and others.

In our view, at the initial stage of robotization of construction, the developers should concentrate their efforts not on creating robots, but on working out and introducing simple and reliable manipulators, with manual or if necessary with microprocessor control. Complicating in any way this already complicated task, which at times results from the boldness of ignorance, leads to nothing more than needless expense of time and money.

In conclusion it should be stressed that mechanization and automation of construction production cannot be developed in isolation from such aspects of industrialization as improvements in designs, of buildings and structures; improving their technological state; standardization of construction processes and operations; and of course, without searching for principally new approaches to the technology of construction processes itself, a quest which makes use of all the capabilities furnished to us by the achievements of the basic sciences and technical means already implemented in other branches of the national economy.

The solution of these tasks goes hand in hand with the single primary goal--increasing the effectiveness of construction production, which is possible only through the combined efforts of the scientific-research, planning, and planning-engineering organizations serving the branch.

In this connection it is very significant that at this time, when the tasks for the state plan for the 12th Five Year Plan are being formulated, these tasks find their place in the appropriate comprehensive scientific-technical programs. Here the leading role in coordination will obviously go to the TsNIIOMTP [Central Scientific Research and Experimental Planning Institute for the Organization, Mechanization and Technical Assistance of Construction] of USSR Gosstroy--the leading institute in the branch on problems of mechanization and automation of construction production.

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CONSTRUCTION METHODS AND MATERIALS

BRIEFS

MOBILE ANTENNA--A mobile antenna mast, which will permit the attachment of UKV [ultrashort-wave] and KV [short-wave] band antennas, has been developed in the Mariy Territorial Constructional Administration for the organization of radio communications for facilities that are under construction some distance away. It consists of coupling flanges of pipes of various diameters, four FS-type footing blocks, and three rows of galvanized guy wires,4 mm in diameter, which are fastened to the flanges. It is assembled as follows. The footing blocks are laid on a sandy preparation 0.1 meter deep. The mast is assembled in the horizontal position. The lower end of it is mounted in a hinged joint. It is connected with two rows of the guy wires and the third row is attached to the auxiliary mast, by means of which the main mast is lifted into the initial position. It is fixed in the vertical position by tightening the turnbuckles that are located on the guy wires. The auxiliary mast is removed after raising, and the antenna mast is then ready for operation. Its height can be 6.5, 11.5, 15.5 or 18.5 meters. These are chosen on the basis of members 6.5, 4.3 and 2.5 meters long, which are convenient for transporting. The weight of the kit, including the guy wires, is 140 kg. The force necessary for raising the mast into the vertical position, which is applied to the auxiliary mast, is 250 kGs [kilograms-force]. Use of the mobile antenna mast greatly improves the communications service for centralized control. Requests for information should be sent to: 424013, Yoshkar-Ola, Leninskiy pr., 40, Orgtekhstroy [State Trust for Industrialized Construction] of the Mariy TUS [Territorial Construction Administration]. [Engineer A. Kharlampyev] [Text] [Moscow NA STROYKAKH ROSSII in Russian No 10, Oct 85] [COPYRIGHT: Izdatelstvo "Sovetskaya Rossiya", "Na stroykakh Rossii", 1985] 11409

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