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CONSTRUCTION AND EQUIPMENT

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USSR REPORT CONSTRUCTION AND EQUIPMENT

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CONSTRUCTION

CAPITAL CONSTRUCTION IN INDUSTRIAL SECTOR DISCUSSED

Moscow PROMYSHLENNOYE STROITEL'STVO in Russian No 6, Jun 82 (signed to press 20 May 82) pp 2-5

[Article by Yu. V. Petrov, secretary, Sverdlovskaya Oblast CPSU Committee: "Modern Economical Designs for Construction Sites"]

[Text] From the Editors

The problems of improving project-design work received great attention at the 26th CPSU Congress. They were the subject of a special decree of the CC CPSU and the USSR Council of Ministers, No 312 of 30 March 1981, "On Measures to Further Improve Project-Design Work."

Extensive recommendations to improve project-design work in the light of the decisions of the 26th CPSU Congress, the November (1981) Plenum of the CC CPSU, and the Decree No 312 of the CC CPSU and the USSR Council of Ministers, were adopted by the All-Union Conference of Workers of the Ministries and Departments, Union Republic Gosstroys, and Research, Design, and Development Organizations, held in Moscow between 24 and 26 November 1981. This is quite natural considering that project designs are the foundation for applying to construction the latest scientific and technical accomplishments, progressive technology and organization of labor, and achieving the conservation of material resources and an increase in labor productivity. Hence, in Sverdlovskaya Oblast the problems of improving project-design work receive a great deal of attention.

In December 1981 the Sverdlovskaya Oblast CPSU Committee and the NTO [Scientific and Technical Society] of Construction Industry organized a conference of the workers of design, research, and construction and installation organizations on further improvements in the design and construction of housing and communal facilities as well as production facilities, in the light of the decisions of the 26th CPSU Congress and the decree of the CPSU and the USSR Council of Ministers "On Measures to Further Improve Project-Design Work."

At the conference interesting reports were presented and substantial speeches made. The editors regard it as their duty to present some of them to the reader's attention.

At the same time, the editors of this journal wish to express their thanks to the Sverdlovskaya Oblast party committee for its repeated assistance in organizing the thematic selection of the articles.

The 26th CPSU Congress, having determined the main socio-economic tasks for the 11th Five-Year Plan, put forth the strategic line toward the further intensification of the country's economy. In this connection, complex and responsible tasks face the capital construction branch, where special stress is placed on increasing effectiveness and recouping capital outlays concretely and rapidly.

Sverdlovskaya Oblast is a major economic region of this country. It accounts for 35 percent of the volume of industrial output in the Urals. It produces more than 60 percent of the all-Union output of asbestos and about 40 percent of all freightcars; the oblast's enterprises melt 11 million tons of steel, smelt 8 million tons of pig iron, and produce 8.5 million tons of rolled stock as well as other products. The Central Urals are a land of highly developed agricultural production as well as the nation's major science center.

Built under Soviet rule, this vast economic potential also requires large capital investments and a developed construction industry.

There now operate in the oblast more than 60 construction and installation trusts and 110 enterprises of the building materials industry and construction industry whose varied output exceeds 1 billion rubles.

During the 10th Five-Year Plan period some 400 large production facilities and capacities were put into operation. For constructing at a high technological level the wide-strip rolling mill at the Nizhniy Tagil Metallurgical Combine [NTMK] and turbine-boiler units at the Reftinskaya State Regional Electric Power Plant [GRES] and Beloyarskaya Atomic Electric Power Station [AES], as well as for modernizing the converter shop at the NTMK, the participants in construction received the distinction of greetings from the General Secretary of the CC CPSU comrade L. I. Brezhnev.

During the Five-Year Plan period 9.6 million sq m of dwelling area, schools and kindergartens for an enrollment of 150,000, and many cultural and communal facilities were built. During that period the fixed assets of industry grew by 25 percent, and of agriculture, by a factor of one and one-half times.

The 11th Five-Year Plan period also is characterized by the growth of the volume of capital construction, with an increasing part of outlays being channeled into the modernization and technological re-equipping of enterprises and an increasing number of facilities being scheduled for construction in medium and small towns that lack local construction and installation bases and capacities. Hence, the problems of increasing the effectiveness of capital investments and improving the organizational and technical level of construction sites receive unflagging at-

tention from the oblast party organization. Here, various forms and methods are employed. One of them is the systematic convening of oblast conferences of the workers of design, research, and construction and installation organizations, as well as of the customer enterprises, with the participation of party and Soviet agencies. The need for these measures is due to the fact that in the oblast there operate 24 design institutes and 53 project-design departments which during the 10th Five-Year Plan period alone carried out 300 million rubles of design work. Projects by Ural designers are used to build complexes, structures, and buildings in many of the nation's cities as well as abroad.

For their great contribution to the development of the national economy and high production indicators during the 10th Five-Year Plan period, the Ural Promstroy-niiprojekt [Ural Scientific Research Institute of the Construction Industry] was decorated with a Certificate of Commendation from the Presidium of the RSFSR Supreme Soviet, while the institutes Uralkmekhanobr [Ural Mechanical Treatment], Uralgiprotyazhmazh [Ural State Institute for the Design and Planning of the Heavy Machinery Industry], and Unipromed' [Ural Research and Design Institute of the Copper Industry] were decorated with orders.

Many projects of the collectives of the design and construction and installation operations were awarded State prizes and prizes of the USSR Council of Ministers.

In the last 10 years the construction sites in the Central Urals underwent major qualitative changes. The share of offsite prefabricated construction increased by a factor of 1.7 and the volume of large-panel house construction, by a factor of 1.6. Construction uses widely patterned flooring and lightweight metal structural elements for the floors of buildings in the II-04 and II-20 series, as well as effective heat insulating materials, prefabricated foundations, wall partitions, and floors, built-in premises, "stekloprofilit" [shaped glass], and many other products which 10 years previously were either not used at all or used in insignificant quantities.

Construction-industry facilities have become greatly consolidated. The output of precast reinforced concrete has increased to 80,000 cu m a year, of which the output of prestressed concrete alone has doubled and the output of lightweight concrete, increased by a factor of 26. Woodworking enterprises as well as enterprises for the fabrication of metal structural elements have been greatly developed. During that period, more than 1 billion rubles in capital outlays had been invested in the building materials industry and the construction industry.

During the 10th Five-Year Plan period alone the newly built and opened plants included the Pervoural'sk plant for the production of complete sets of metal structural elements, a shop for molding precast reinforced-concrete structural elements in long stands without board enclosures; the nation's first gypsum concrete products plant in Krasnoufimsk; and the Artemovskiy Rural Construction Combine. In addition, the modernization of most of the large-panel housing construction [KPD] plants was carried out to convert them to constructing modern series of residential buildings.

At the same time, the party cannot remain complacent in face of the fact that during the 10th Five-Year Plan period the plan of construction and installation

operations has not been entirely fulfilled, the growth rate of labor productivity has declined, and the volume of uncompleted construction has increased. Indicators of the effectiveness of capital investments in ferrous and nonferrous metallurgy as well as in the light, coal, lumber, and woodworking industries have declined.

Replacement of obsolete and depreciated equipment is taking place at the level of only 2 percent annually so that, as a consequence, nearly one-half of those employed in industry continue to operate obsolete equipment.

Hence, the regular oblast conference of design organizations focused its attention on problems of increasing the effectiveness of capital investments in the stage of the designing of production complexes and structures.

The 1981 Decree of the CC CPSU and the USSR Council of Ministers "On Measures to Further Improve Project-Estimate Work" faces designers directly with the task of assuring a high effectiveness of capital investments.

In the Sverdlovskaya Oblast this means chiefly selecting the path of technological re-equipping and modernization. We have gained considerable experience on this path in the past years. The high effectiveness of the renovation of fixed assets at existing enterprises has been demonstrated more than once. In 1980 the "30-102" rolling mill at the Pervoural'sk New Pipe Plant was modernized (prime designer: the Uralgiprommez [Ural State Institute for the Planning of Metallurgical Plants]). Originally opened in 1962, this rolling mill underwent four stages of modernization since then. As a result, its capacity has increased one and one-half times and today it is the world's largest mill of its kind, in terms of capacity. Its personnel was reduced by 200, its labor productivity increased by a factor of 1.7, and its unit fuel and energy consumption decreased 30 percent. Savings of 30 million rubles in capital outlays were achieved. This is a shining example of the creative collaboration of plant workers, the design institutes, and builders.

During the 10th Five-Year Plan period dozens of shops and sectors in the oblast were modernized, which accounted for nearly 50 percent of the overall increment in gross output as well as for savings of 500 million in capital outlays.

However, we cannot remain satisfied with the results achieved. Only one-third of capital outlays at present is allotted for technological re-equipping and modernization. This is clearly insufficient. It is worth noting here that the USSR Gosstroy and the USSR Gosplan even so cannot fundamentally resolve the principal problem impeding the further expansion of the scale of the modernization of enterprises in this country--the provision of incentives for construction and installation organizations as well as for other participants in construction. The introduction of correction coefficients, the changes in the bonus system, and other measures drafted have changed little in this field, with modernization continuing to be a "losing proposition" to the subcontractor organizations, which avoid doing it under various pretexts.

For the 11th Five-Year Plan period, the comprehensive targeted program approved by the oblast party committee envisages allotting 41 percent of all capital outlays for the technological re-equipping and modernization of existing enterprises. In ferrous metallurgy the share of modernization will be 43 percent; in machine build-

ing and metalworking, 56 percent; and in the lumber and woodworking industries, 62 percent.

On the whole, technological re-equipping and modernization are expected to account for 72 percent of the increment in output, relieve 21,500 persons for other work, and save more than 1 billion rubles in capital outlays to the national economy.

The principal factor in increasing the effectiveness of capital investments is the progressiveness of the adopted production technology. The task is to make the newly built or modernized enterprises technologically advanced by the time they are put into operation and manufacture products at the highest level of quality. The technological processes employed should assure maximal mechanization and automation of not only basic but auxiliary operations, and they should result in a marked reduction of the unit consumption of raw and other materials and energy resources, as well as in a maximally complete recovery of by-products and a sharp reduction of production wastes.

It should be noted that poor development of the mechanization of auxiliary and final operations is a feature of many designs that otherwise provide for high-level technologies of basic operations.

There is also another reason for the poor level of the designing of technological processes--the insufficiently demanding attitude of customers toward the quality of designs, their superficial study, and the absence of cooperation between institute experts and plants in the development of blueprints. A great role in the development of progressive production technologies belongs to the leading research and design institutes of the ministries. And at present, design organizations complain justifiably that the technical standards formulated for technological design often do not meet modern requirements and are based on ideas that often already are archaic.

The potential for increasing the effectiveness of capital investments is present in, among other things, the reduction and correct determination of the cost of the designed projects. According to the Stroybank [All-Union Bank for the Financing of Capital Investments], as shown in its statistics on the 10th Five-Year Plan period, revisions of discrete projects by the oblast's institutes resulted in increasing their cost estimates by 40 percent above the original. The reasons may be different in every individual case, but one common reason is worth mentioning. This concerns the scanty and often simply superficial revisions of design solutions based on the schedule and estimated cost of construction. The current practice of allocating for design work 1.5-2.5 percent of the cost of a future facility restricts markedly the ability of design organizations to elaborate the designs applied and virtually precludes the possibility of multiple-variant designing. All this is ultimately remedied in the course of construction itself at the cost of construction delays, tense moods, and unanticipated expenditures.

Consider a concrete instance. The 1980 plan of the Sverdlovskzapstroy Construction Trust provided for putting into operation an aluminum foil shop at the Mihaylovsk Plant of the OTsM [Association of Nonferrous Metals Plants]; this involved 5.5 million rubles of construction and installation operations (prime designer: the GiproTsMO [State Scientific Research and Design Institute of Alloys and the

Working of Nonferrous Metals], Moscow). The plan for building the shop was considerably overfulfilled, but its start-up in 1981 required additional outlays of 3.9 million rubles, upon again overfulfilling the plan 140 percent.

For the Glavsreduralstroy [Main Central Urals Construction Administration] as a whole, the 10 construction projects of special importance to the state that had been completed in 1981 required spending more than 3 million rubles in additional outlays, or overfulfilling the plan 114 percent.

I believe that the USSR Gosstroy and Gosplan should examine this highly important issue and take appropriate measures.

There unfortunately also exist other instances of insufficient preparation of design solutions. As shown by an analysis of the performance of the experimental bureau of the Glavsreduralstroy, established in the 10th Five-Year Plan period, the cost estimates of individual construction projects are unjustifiably raised by 10-15 and sometimes even by 30-40 percent by the institutes. For example, the project for the Sverdlovsk "Sel'khoztekhnika" [State Agricultural Kolkhoz Equipment Trust] marketing and warehousing facility in the town of Berezovskoye (designed by the Uralgiprotrans [Ural Institute for Transportation Design]) was such that, on the designated construction site, where the forest was to be cleared, a possible expansion of the warehousing areas was provided for although it was not envisaged in the design task. The warehousing area was enlarged by 10 percent. The adopted design solutions disregarded the requirements of the USSR Gosstroy regarding a reduction in heat loss: all warehousing premises are heated even though part of the materials can be stored in unheated premises, and the warehouse temperature was fixed at 18°C instead of the required 12°C. Furthermore, the window apertures are considerably greater than needed for natural lighting, which requires the consumption of an additional 1,200 tons of nominal fuel annually for heating and ventilation.

The administrative and communal premises and the canteen are housed in separate buildings instead of being rationally combined into a single whole and interlocked with the warehousing area. The built-in dwelling spaces in the warehousing area are based on series II-20 designs, suited for multi-story production buildings, instead of on the more suitable series II-04. As a result, the cost estimate was exceeded 30 percent; steel consumption, 17 percent; cement consumption, 15 percent; and labor expenditures, 30 percent.

One of the principal tasks formulated in the Decree No 312 of the CC CPSU and the USSR Council of Ministers is the maximum incorporation of achievements of science and technology in the designs, along with a broad introduction of industrialized construction techniques assuring higher labor productivity during every construction stage. Given the existing acute manpower shortages, this problem is particularly topical. We perceive its solution to lie primarily in the combining of the creative efforts of scientists, designers, builders, and customers.

The isolated instances of the signing of contracts for creative collaboration among the collectives of designers, customers, and construction contractors, have now evolved into a permanent system of mutual relations and the basis of operative contacts. For example, promising long-range agreements for creative collaboration

have been concluded with the institutes Uralgiproruda [Ural State Institute for the Design and Planning of Ore Mines], Uralgiprotyazhmash, Uralgiprometz, and the Ural Vodokanalproyekt [State Planning Institution for the Surveying and Planning of Outdoor Water Supply, Sewer Systems and Hydraulic Engineering Structures]. Most organizations adopted socialist pledges to work under the slogan "Excellent Quality From the Design Stage to the Completed-Facility Stage." They place chief emphasis on problems of increasing the effectiveness of capital investments and the quality of designs as well as on reducing the materials- and labor-intensiveness and labor expenditures on construction, and also on shortening the construction schedules.

Upon a decision by the obkom party bureau, during the 10th Five-Year Plan period there was established the oblast scientific and technical council for design and construction. For the current period, the council has examined a number of the most topical problems: industrialization and standardization of the construction of agricultural production facilities; the development of the production of progressive materials and structural elements during 1981-1985, the long-range comprehensive program for improving the spatial-layout and design solutions for production buildings, etc.

At the same time, the problem of reducing the labor-intensiveness of construction also remains topical. The share of manual labor among builders remains high and is declining extremely slowly. The expenditures of labor are particularly high when erecting small auxiliary facilities. According to statistics of the USSR State Committee for Labor [Goskomtrud], the labor-intensiveness of the construction of subsidiary and auxiliary facilities per cu m of a building is greater by a factor of 3-5 than that of the construction of the basic production facilities. Calculations show that this account for altogether 20-30 percent of all labor expenditures in construction.

During the 11th Five-Year Plan period the application of the following products will be broadened in the oblast: precast reinforced-concrete structural elements, asbestos-cement products, glass, tubular metal structural elements, wide H-beams, and lightweight partition elements. The products of the Pervoural'sk plant for complete sets of structural elements--doors, windows, gates, offsite-prefabricated room units, industrial partitions, and other offsite-prefabricated products will begin to appear on construction sites. For the 11th Five-Year Plan period a comprehensive targeted program for the oblast has been approved with regard to the production and development of new production capacities for up-to-date progressive structural elements, materials, and products. The fulfillment of these measures will serve to markedly improve the technological level and reduce unit labor expenditures on the construction of buildings and structures.

Considerable attention nowadays is paid to the conservation of material resources. "Raw and other materials should be thriftily expended, waste should be reduced, and losses should be eliminated," as pointed out in the Decree of the CC CPSU and the USSR Council of Ministers "On Strengthening the Work to Conserve and Rationally Utilize Raw-Material, Fuel, Energy, and Other Material Resources." "This means an economical labor of millions of people, savings of capital outlays, increases in output, and protection of natural environment."

In our oblast each year 350,000 tons of metal, 1.5 million tons of cement, 370,000 cu m of lumber, more than 1 million sq m of glass, and quantities of many other products are spent on construction.

Attaching special importance to problems of the rational utilization and conservation of ferrous metals, the party obkom approved a special comprehensive targeted program which provides for saving the national economy 93,000 tons of metal and many other materials in construction during the 11th Five-Year Plan period. The principal directions of the measures drafted are: the use of high-strength grades of steels; the supplanting of metal with other materials; meticulous savings of metal during the fabrication of metal structural elements; and the use of poured-on-the-spot and precast reinforced concrete elements. A major role here belongs to the design organizations. As analysis shows, the degree of overconsumption and underutilization of metal in designs ranges from 2.5 to 11 percent.

Designs often provide for poured-on-the-spot structures in situations in which it is impossible to employ planking, and they continue in many cases to incorporate plank floors, massive gates, fences, huge roof trussing systems, etc.

Designers have not learned how to use properly nonrecoverable concrete planking, including patterned flooring with allowance for its performance and design, although every 10th cu m of lumber in construction is spent on concrete planking and, as a rule, is used but once.

Many justified complaints about design organizations are being made with regard to their fascination with glass, their metal-intensive reinforcement of equipment, and their unjustified centralization of utility networks which necessitates installing kilometers of piping and cable ducts in the shops, as well as with regard to redundancy in design and architectural solutions.

As yet, the efforts of scientists and research and technology institutes are insufficiently attracted to the conservation of materials. All this results in large unjustified excess consumption of materials, and raises the construction cost of facilities while at the same time adversely affecting their performance.

The Decree No 312 of the CC CPSU and the USSR Council of Ministers is of great importance to improvements in the planning of design and development work. The chaotic and excessively complex situation in this respect should be resolved.

The plans for design and development work are not tied to the plans for capital construction. As a result, each year the number of newly initiated designs exceeds the number of new construction sites, which naturally results in the obsolescence of blueprints.

According to Stroybank statistics, design blueprints which are not used in construction cost in the neighborhood of 800 million rubles for the oblast. Every third project in practice is either abandoned or revised so that a great deal of work is wasted. At the same time, the plan of capital construction includes hundreds of facilities for which design blueprints have not been provided.

The planning procedure adopted in the decree should indisputably greatly improve the linkage of plans, but only provided that long-range branch and regional schemes are worked out.

One of the tasks formulated in the decree is the reduction in the labor-intensiveness of design work and the increase in the level of labor productivity. Primarily, automated design systems are to be widely introduced. The oblast's institutes at present operate with solid material and equipment facilities, and broadly utilize the SAPR [Automated Design System] in their work.

At the same time, the solution of the problem involves many difficulties. This applies chiefly to the dispersal of computer equipment among the departmental organizations. Even the institutes of the unified system of the Ministry of Ferrous Metallurgy operate as many as 10 discrete computer centers in the oblast. In our opinion, it is expedient to combine them into a single territorial center as a first stage, even if only administratively. Only a handful of automated graphic plotters is available for all of the oblast's institutes. It is thus difficult to believe that the level of automation will be raised to 15-20 percent in 1985 as specified in the decree. The USSR Gosstroy should take concrete steps to provide design organizations with equipment and SAPR software, and to set up large regional computer centers, because only then it is possible to speak justifiably and confidently of a change to the better in the quality of the forms and methods of design work based on the automation of design operations. Unfortunately, it must be also stated that the pertinent standards issued by the USSR Gosstroy have in practice, in many cases, even increased instead of reducing the volume of design documents.

The problem of work assignments for specialized design organizations has become extremely acute. The branch institutes continue to set up and expand their own design departments even though the economic and technical effectiveness of their performance is largely inferior to that of specialized design organizations. The designing of civil-engineering projects in the oblast is handled by 29 oblast and 50 outside design organizations, and at the same time the UralTISIZ [expansion unknown] does 38 percent of its program for customers outside the oblast. Most specialized design organizations at present essentially are looking for assignments throughout the country, although it would have been much more appropriate to entrust to them assignments pertaining to our own region. The USSR Gosstroy should draft a system for assigning tasks to specialized design institutes and work out an optimal scheme for combining the specialization and development of comprehensive branch institutes.

In fulfilling the adopted decree of the CC CPSU and the USSR Council of Ministers "On Measures to Further Improve Project-Design Work," we attach great importance to the activity of the party and public organizations at design institutes. The findings of the conference are the subject of party meetings at design organizations and prompt the adoption of new pledges and the conclusion of long-range agreements for creative collaboration. The initiative of the staff of the Gidroproyekt [All-Union Planning, Surveying, and Scientific Research Institute imeni S. Ya. Zhuk] in increasing the scientific and technical level of design work and correspondingly reducing the estimated cost of construction and conserving man-

power and material resources--an initiative that has been approved by the CC CPSU--is widely spreading through the oblast's institutes. Thus, for example, the collective of the Uralgiprotiyazhmash Institute plans to achieve the following savings during the 11th Five-Year Plan period, through the implementation of additional measures: 6 million rubles in capital outlays, 1,600 tons of metal, 3,000 tons of cement, and 5,000 tons of nominal fuel. The institute dispatched an appeal to customers, builders, subcontracting design organizations, design offices, and scientific organizations, asking them to support its proposals.

The Ural Vodokanalproyekt [State Planning Institution for the Surveying and Planning of Outdoor Water Supply, Sewer Systems, and Hydraulic Engineering Structures] pledged itself to save 3 million rubles in capital outlays in excess of its previously adopted pledges, during its design work. Specifically, it pledged itself to reduce the construction cost of filtration stations by 10-12 percent and cut the maintenance cost by 6-8 percent, while at the same time increasing labor productivity 20 percent.

The Uralgiprommez Institute, supporting the initiative of the Hidroproyekt, adopted additional pledges to draft designs that would save, in excess of the current level and standards, fuel-energy resources amounting to 18,000 tons of nominal fuel as well as 20,000 tons of metal and 27,000 tons of cement. Further, it pledged itself to reduce by 400 persons the numbers of maintenance personnel on the facilities it designs, as well as to reduce by 1 percent the capital outlays per ruble of production.

In response to the decisions of the November (1981) CC CPSU Plenum and the decree of the CC CPSU and the USSR Council of Ministers "On Measures to Further Improve Project-Design Work," the Ural designers launched a sweeping socialist labor competition under the slogan "Provide construction sites with modern and economical project designs" and they express their firm confidence in the fulfillment of the tasks posed by the decree of the CC CPSU and the USSR Council of Ministers to improve project-design work.

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CONSTRUCTION

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RSFSR GOSSTROY CHIEF DISCUSSES HOUSING CONSTRUCTION PROGRESS IN RSFSR

Moscow ZHILISHCHNOYE STROITEL'STVO in Russian No 5, May 82 (signed to press 28 Apr 82) pp 2-8

[Article by RSFSR Gosstroy Chairman S. N. Sabaneyev: "Housing Construction Development in the RSFSR"]

[Text] The 60th anniversary of the adoption by the 1st All-Union Congress of Soviets of its historic decisions to create the world's first unified multinationality state--the Union of Soviet Socialist Republics--will soon arrive. During this 60 years, which is short for many states, our country has accomplished, under the leadership of the Communist Party of the Soviet Union, the most profound social and economic transformations. A developed socialist society with high-capacity productive forces, a mighty economic potential, and advanced science and culture has been constructed. Social and political unity of the Soviet people has been born and become stronger. The Soviet state has become a state of the whole people.

In the onward development of the USSR's national economy, the Russian Federation has had and will have an important role.

CPSU Central Committee General Secretary and Chairman of the USSR Supreme Soviet Presidium Comrade L. I. Brezhnev, in addressing the voters of Moscow's Bauman electoral district, emphasized that the RSFSR occupies a leading place in the constellation of republics, which have equal rights--in regard to population, area, natural resources, and economic, scientific and technical potential.

The RSFSR's economy is the largest member of the country's single national economic complex. During socialist construction its industry has grown immeasurably and it has gone on to advanced frontiers. The republic's total industrial output volume has risen more than 160-fold over 1913's. Many new branches of industry have been created from scratch. Right now the republic's industry produces in 2.3 days the whole annual volume of industrial output of prerevolutionary Russia. The gross output of its agriculture has risen more than 3-fold.

The republic's achievements in housing, social and cultural construction and in raising the material level of the people's lives are great. The total urban housing inventory has been increased 12-fold over 1913's, while the growth in population has been 6.2-fold. The availability of housing per resident has risen during this period from 7 to 13.3 m² of total space, with an incomparably higher level of permanence of construction, of utilities and service equipment, and of housing comfort. In a historically brief period, the face of the Russian Federation's

cities and workers' and agricultural settlements has changed beyond recognition. Since 1917, 623 new cities and towns and 1,180 new urban-type settlements have been established in the republic. In the first five-year plans alone, based upon the largest construction projects, 217 cities and towns have risen up, including such large cities as Magnitogorsk, Novokuznetsk, Komsomol'sk-na-Amur, Noril'sk, Kirovsk, Magadan and many others.

The prewar years were marked by large-scale introduction into practice of new housing designs and high-speed assembly-line methods, based upon the rising level of mechanization and industrialization of construction. With the victorious conclusion of the Great Patriotic War, work that was vast in scale and complexity was done to restore the many thousands of cities, towns, settlements and rural communities that were destroyed by the German Fascist aggressors. More than 100 large cities, including Volgograd, Voronezh, Kalinin, Kursk, Murmansk, Novgorod, Novorossiysk, Orel, Pskov, Smolensk and others rose up from the ruins and were built practically from scratch.

The measures that the party and the government adopted in postwar years to improve living conditions and domestic amenities for the populace and the industrialization and standardization of housing construction enabled the pace and scale of restoration and construction of new apartment houses to be increased each year. In the last two five-year plans more than 250 million m² of housing were restored or newly built.

The industrialization of housing construction in accordance with standard designs of the 335 and 464 series, the so-called "first generation" series, with economical apartments, which enabled better solution of a socially important problem--granting separate apartments for settling families, was widely propagated on the borderline years of the 1950's and 1960's. While in old-type housing only 30 percent of the families received separate apartments, in the new apartment houses the percent of apartments settled by single families was substantially higher.

The successes that the country achieved in developing industry and in further strengthening the construction industry's base paved the way for further expansion in the 1960's of the scale of housing construction and improvement in providing the population with housing. On this basis, the norms for construction design were reviewed and, accordingly, the existing and newly developed standard designs for "second generation" apartment houses were revised, and construction and layout solutions improved. Instead of the practice of the uncoordinated construction of individual apartment houses and small city blocks, the principles of the integrated development of whole microrayons and of large housing tracts with municipal and cultural services and domestic amenities for the people were introduced.

However, the limited variety of standard designs reduced the potential for architectural expressiveness of the housing complexes, which, with an increased amount of fully prefabricated housing construction, led to monotony in the development of many cities.

The CPSU Central Committee and USSR Council of Ministers decree, "On Measures for Improving the Quality of Housing and Nonindustrial Construction," which was adopted in 1969, set important tasks for substantial growth in the amounts of construction of housing and cultural, domestic-amenity and municipal services and a rise in the level of industrialization and the quality of housing and nonindustrial

construction. In accordance with this decree, housing construction in the Russian Federation was promoted on an especially large scale during the 9th and 10th Five-Year Plans.

Based upon comprehensive plans for social and economic development, a master scheme for settling people was worked out and put into effect. A unified system of cities and rural settlements that provides a high level of cultural services and domestic amenities for the urban and rural population is being created. Today, practically all large and medium-size cities, rayon centers and central farmsteads of sovkhozes and kolkhozes have been provided with master plans, which are being improved continuously and will serve as the bases for the large urban development measures that are being conducted in the republic.

Development of the productive forces in the country's east has stimulated the forming and the intensive development of many new cities, among them Nizhnevartovsk, Nadym, Nefteyugansk, Novyy Urengoy, Strezhevoy, Sayanogorsk, Sosnovoborsk, Ust'-Ilimsk, Sayansk, Sharypovo, Neryungri, Amursk, Severobaykal'sk, Tynda, Ust'-Kut and so on. In the European portion of the USSR, the cities of Volgodonsk, Sosnovyy Bor and others have been created.

During the 9th and 10th Five-Year Plans, apartment houses totaling 600 million m² in area were built, enabling housing conditions to be improved for more than 60 million people. More than 13,000 general education schools, about 2,800 preschooler institutions and a large number of other buildings for cultural purposes and personal amenities were turned over for operation. The level of industrialization of housing and nonindustrial construction was raised. The proportion of fully prefabricated housing construction in the total volume of housing construction carried out by state contracting construction organizations was raised to 68.5 percent for the RSFSR, or by 13 percent in comparison with 1975. The practice of building frame-free large-panel high-rise buildings is being disseminated. Such buildings are now being erected to a height of 23 stories. New improved "third-generation" series standard designs for apartment houses have been widely disseminated. The proportion of buildings erected in accordance with these designs in total large-panel housing construction has risen to 62.3 percent vs 25.9 percent in 1975.

More than 240 large-panel housing-construction enterprises have now converted to the production of apartment houses built under new standard-series designs, and many of them have achieved good results in the assimilation of design capacity and the fulfillment of established plans for housing construction with high quality of the buildings erected. The Ul'yanovsk and Penza DSK's [housing construction combines] of USSR Minstroy [Ministry of Construction], the ZhBI-2 [Reinforced-Concrete Products Plant No 2] and ZhBI-6 of USSR Minpromstroy [Ministry of Industrial Construction] in Omsk, the Sverdlovsk DSK of USSR Mintyazhstroy [Ministry of Construction of Heavy Industry Enterprises], and others have completely assimilated their production capacity since converting to output of the new series.

This execution of large-scale plans for housing construction is unthinkable without new, progressive methods for managing and organizing construction operations being put into practice.

A positive example of the realization of purposeful measures is the work of the ispolkoms of the soviets of people's deputies in the cities of Orel, Yaroslavl', Izhevsk and Cheboksary, where the function of a single client for the construction of apartment houses and facilities for cultural, domestic-amenity and municipal

services facilities is executed by the city's capital-construction administration. Measures for concentrating capital investment for housing construction in a single client, the introduction of continuous two-year planning and flow-line construction methods, and good work by housing-construction enterprises have enabled apartment houses to be introduced into operation with regularity in these cities in recent years.

The DSK of USSR Minstroy's Chuvash Regional Construction Administration has been working persistently for many years. In 1981, 84 percent of the housing constructed by the combine were turned over for use with "good" and "excellent" evaluations. All the enterprise's brigades are operating under the start-to-finish brigade contract. The best erectors' brigade of Hero of Socialist Labor M. I. Ivanov has for a number of years been a "beacon" in the administration.

The Gatchinsk SDSK [Rural Housing Construction Combine] of USSR Minstroy's Glavzapstroy [Main Administration for Construction in the Western Economic Region], which is developing rural settlements and a number of cities in Leningrad Oblast, has, with conversion to the new 121-L0 apartment-house series, completely assimilated its production capacity, and, based upon the introduction of integrated flow-line construction methods, has systematically fulfilled the plans for turning over finished construction output. In 1981 the combine turned over apartment houses totaling 300,000 m² in area, of which 69 percent were turned over with "good" or "excellent" evaluations. Practically all the brigade's combines achieved good results.

Both indicated enterprises were awarded challenge Red Banners of the CPSU Central Committee, the USSR Council of Ministers, the AUCCTU and the Komsomol Central Committee, with recording thereof on the All-Union Honor Plaque at the VDNKh SSSR [Exhibition of Achievements of the National Economy of the USSR] for results of the All-Union socialist competition for 1981.

The Orekhovo-Zuyevo DSK of Glavmosoblstroy [Main Administration for Construction in Moscow Oblast], which in 1981 carried out the plan for introducing apartment houses into operation by 121 percent, achieved good results by using advanced work methods and introducing the integrated flow-line construction method. For its 1981 results the DSK was awarded the challenge Red Banner of the RSFSR Council of Ministers and the AUCCTU.

Introduction of the construction of new standard designs series into practice has enabled large-panel housing construction quality to be improved and the comfort level of large-scale housing to be raised.

Conversion to the interlocking-section method of design has paved the way for raising the esthetic qualities of large-scale housing construction, and it has also enabled a better ratio of apartments to be achieved as a function of the specific demographic situation during the development of housing rayons.

Progressive trends and the potential of the interlocking-section method was graphically demonstrated during the buildup of housing rayons in Naberezhnyy Chelny, Tol'yatti, Tynda, Sosnovyy Bor and a number of other cities. The use of differences in the number of stories, size and sculpturing, and the length and proportions of apartment houses, in combination with the social buildings, has enabled ensembles to be created that are diverse in composition. Positive experience in

the integrated development of residential microrayons in Zelenograd, Dzerzhinsk and some other cities has been gained, as a result of which not only urban development but also a social benefit was achieved.

However, examples of successful urban-development solutions and the integration of the developments themselves still are not numerous. In most cities that are new or are being developed, housing construction greatly outstrips the progress of the whole infrastructure of microrayons. Schools and children's institutions are still being introduced with a delay of 2-3 years, and the construction of shopping enterprises, public eating and domestic-amenity services for the population are being delayed for even longer periods.

The critical remarks on urban-development and architectural matters that were expressed in the Accountability Report of the CPSU Central Committee to the 26th Party Congress apply as a whole and completely also to the practice of building up cities and villages in the RSFSR.

With the modern scale of construction, architectural works that possess the virtues of really artistic forms still make up a small proportion. The architectural level of large-scale housing buildups still is not high. The task of the ensemble type of development of cities and rural settlements and of the creation of large architectural complexes with a completeness of systems for public services, which will enable social questions to be resolved, and which, as Comrade L. I. Brezhnev pointed out, will be marked by great artistic expressiveness and diversity, has been set as the most important task for Soviet architecture and urban development.

We see radical improvement of standard design and use of the growing creative potential of local design organizations as ways to solve the problem. Experience has shown that each building should be not "correlated" with but be designed on the basis of the overall architectural concept, taking the landscape and other peculiarities of the natural environment into consideration. It would seem that the new methodology of standard design that we are developing, jointly with Gosgrazhdanstroy [State Committee for Nonindustrial Construction and Architecture] will enable the development of cities and rural settlements to be improved and their esthetic level and expressiveness to be raised.

A still more complicated problem of creativity is the search for an architectural style for industrialized housing construction. The Muscovites, who have achieved a stylish unity of architecture for large-scale housing, have made a good start. It is not by chance that the work on introduction of a standard catalog for the capital's housing-construction enterprises has received such a high evaluation.

One of the main problems during the 11th Five-Year Plan remains that of raising the quality of large-scale housing construction in the broad sense. This all-encompassing concept includes not only a high technical level in carrying out construction and finishing operations and convenience of layout and comfort of apartments, but also a good esthetic perception of the buildings and of the development as a whole, its integration, and the whole soundness of the environment. We are talking about all the components of a microrayon--the basic structural unit of the residential buildup. This includes schools, nurseries and kindergartens, stores, and other servicing institutions.

Beginning with 1983, the layout, construction and acceptance for operation of apartment houses and of social buildings in new housing microrayons should be accomplished primarily in the form of completed urban-development complexes, at which, when the housing is turned over for operation, the construction of institutions and of enterprises that service the populace and the fulfillment of all work on utilities and service lines, civic amenities, and landscaping of the area should also be completed, in accordance with the plans for developing the microrayon. It is the job of all planning and construction organizations in the republic and local organs for construction and architectural affairs to see to it that these plans are fulfilled without fail.

The major responsibility for supporting the integrated buildup of housing microrayons with good-quality technical documentation that meets modern requirements will be placed on local design organizations and on republic gosstroyes.

A restraining factor in raising housing quality is the slow conversion of housing-construction enterprises to the output of structure for apartment houses in accordance with the new series of improved standard designs. Until now 95 enterprises with a capacity of 15 million m² of total apartment-house space per year still have not been converted to the output of new-series apartment houses. As a result, the cities of Arkhangel'sk, Bryansk, Ivanovo, Kemerovo, Irkutsk, Chita, Ufa and some other large cities are still being built up in accordance with old designs.

One can no longer be reconciled with the spread of the practice under which combines specialize in constructing impressive housing without mastering the production of the whole range of articles called for by the standard series. This restricts greatly the potential for the integrated development of residential rayons and makes for monotony. The negative effect is strengthened by the limited spectrum of facing materials and the low quality of the finish of facade members. Housing construction enterprises should expand the output of the different variants of outer-wall panels, loggia members, balconies, building entrances and small architectural shapes.

A promising area in increasing the capacity of existing housing-construction combines and also in improving the use thereof is the interseries unification of the articles and structure they make. Computations and studies made by the Design Bureau for Reinforced Concrete imeni A. A. Yakushev indicated that with the conversion to the unified 90-75 series designs in Ul'yanovsk and the 125-90 series in Penza, the number of types of articles is halved. Cooperation in the work of enterprises that exist in these cities will enable the additional output of 54,000 and 40,000 m² of total housing space in the existing production area, with a reduction of about 4 rubles in prime operating costs per cubic meter of reinforced-concrete articles. Implementing unification will reduce capital investment requirements for rebuilding enterprises 6-fold for the indicated increases in capacity. Measures are now planned for introducing this progressive measure at KPD [large-panel housing-construction] plants at RSFSR kray and oblast centers for two or more housing-construction enterprises each.

During the 11th Five-Year Plan, housing and nonindustrial construction in the RSFSR will be further developed by raising the level of its industrialization, improving standard design work, improving the quality of the architectural, layout and constructional solutions for buildings, with a reduction in their labor and materials intensiveness, improvement in the production-capacity utilization of housing construction enterprises, and the reequipment thereof with machinery.

Along with improvement in the design and development of housing rayons, experimental work in the area of urban development is to be expanded. Most important here is a check on the practice of new, progressive types of large-scale housing and on development. An experiment in the construction of a large housing complex that has been started in Gor'kiy will serve these purposes in particular. The complex is being designed in collaboration with organizations of the German Democratic Republic. The main thing in this experiment is the study of methods for increasing the effectiveness and quality of construction in terms of the final result--an improved housing complex.

It is also planned to organize similar experimental construction in other natural and climatic zones. Experimental design and construction of apartment houses under "fourth generation" designs, of housing with "flexible layouts," and of social buildings of widely used types, based upon functional modules, will be expanded. Various measures for civic amenities and for utilities and services equipment for rayons of large-scale development are being checked in practice.

Moscow is our chief experimental site, where many progressive areas of domestic urban development are being checked and are receiving the go-ahead for implementation. These areas include the development of large housing rayons, new forms for organizing services for the populace, modern systems of utilities and services equipment and civic amenities, the Unified Catalog of Unified Industrially Produced Articles for the Construction of Housing and Social Buildings, and other areas.

A most important task in the modern era is to save and make rational use everywhere of all types of material resources. There are major reserves for reducing the consumption of fuel and power resources, metals and building materials in housing and nonindustrial construction.

With a view to using these reserves, the republic's design organizations are revising standard designs for housing and nonindustrial buildings that are encountered in large-scale construction. The revision is to be completed in 1982. The revised designs call for improvement in the thermal protection of the buildings' specifications by the use of three-layer wall panels with an effective insulator, the inclusion of thermal attics instead of attic-free roofs, double air-lock entrances, window modules with triple glazing in the northern regions, and other thermal protection measures. A reduction in materials intensiveness is achieved thanks to the improvement of constructional solutions, more thorough analysis of structure, the use of effective materials, and so on.

The revised designs reduce fuel consumption in housing and nonindustrial buildings by 8-15 percent, enabling a saving of fuel and power resources of 400,000 to 700,000 tons of standard fuel equivalent per year by use of the indicated designs in construction.

Much attention is being devoted to developing new, effective structure for constructing special buildings that will enable steel consumption to be reduced by 15-25 percent, or by 4-6 kg per 1 m² of useful space, and to reduce labor expenditure by 8-10 percent in comparison with structure of the **ММ**-04 series by excluding a number of existing structural items. Effective structure includes structure of the 1-020-1 series for frame-and-panel social buildings, the 1-220-1-2 series for panel buildings, and structure of the integrated 25, 125 and 135 series. A number of

standard designs that use them have already been developed. Introduction of the new structure will enable a saving of at least 100,000 tons of steel.

I would like to dwell especially on questions of housing construction in rural communities. One of the prerequisites for successful fulfillment of the foodstuffs program that is being worked out in accordance with 26th CPSU Congress decisions is improvement of the rural populace's housing, cultural conditions and domestic amenities. Today, the solution of such important problems as personnel retention, the creation of stable working collectives and, consequently, the development of agricultural production and a rise in its effectiveness, depends greatly upon the level of housing construction in the village.

The July 1978 CPSU Central Committee Plenum accurately determined the direction for restructuring the village and set tasks for putting order into the structure of housing construction and for increasing the buildup of farmstead houses with production premises for cattle and poultry.

In our republic's specific environment, with its large scale of rural construction, problems of the buildup and architecture of the village are quite severe. Right now such complicated tasks as the creation of a model of a modern rural house, taking into consideration natural and climatic conditions and nationality and household traditions and choice of rational and esthetically expressed layout compositions during the development of rural settlements, which are situated in the almost boundless expanses between the Baltic and the Pacific Ocean, are being resolved.

In recent years the amount of housing construction in rural localities of the Russian Federation has grown remarkably. During the 10th Five-Year Plan, housing totaling 67 million m² in area was built, about 15 m² of it through the populace's resources. Construction in accordance with modern standard designs of one- and two-story houses of the farmstead type, and also of interlocked houses for several families, each allocated a ground section for personal subsidiary economic activity, is finding increasingly wide application.

The experimental buildup of rural settlements, the amount of which rises annually, will help to solve problems that are connected with restructuring of the village. Regional seminar conferences on questions of the integrated buildup of and of amenities for villages that have been held in Gor'kiy for the RSFSR's Nonchernozem Zone and in Krasnoyarsk for Siberia and the Far East have brought great benefit.

There are now many examples of the integrated buildup of rural settlements that have been carried out on a modern level. Work on the development of settlements of Verkhnyaya Troitsa in Kalininskaya Oblast and Shapsha in Tatarskaya ASSR, whose participants were awarded USSR Council of Ministers prizes, have received wide public recognition. More than 500 Russian Federation settlements have been recognized with diplomas of the VDNKh SSSR for the results of the All-Union inspection contest for the best development and civic amenities for rural communities.

Reconstruction of the Serkovo settlement of Gorodetskiy Rayon, in Gor'kovskaya Oblast, where the central farmstead of the Order of Labor Red Banner Kolkhoz Krasnyy Mayak is located, testifies to a high social benefit. Here, based upon the plan for social and economic development of the farm, the settlement was built up in a short time in integrated fashion with two-apartment and four-apartment houses

that have private plots and economic structures, schools for 370 pupils, a Palace of Culture, a children's combine, and shopping and other services enterprises.

Today the domestic life of Krasnyy Mayak Kolkhoz farmers is practically indistinguishable from that of urban life. The problem of personnel has been completely solved, and a stable working collective has been established that achieves great production successes.

Experience in the integrated development of many other villages also has shown convincingly steady progress in agricultural production and organization of the cultural affairs for the village's workers.

The development of individual construction has an important place in solving problems of the integrated restructuring of the village. Experience in creating rural housing-construction cooperatives in Moscow Oblast indicates what prospects are being opened up for rebuilding the village with the skillful use of the initiative and resources of the populace. Here, beginning in 1967, 68 rural ZhSK's [housing construction cooperatives] that built individual houses with a total area of more than 100,000 m² were created. The Druzhba rural housing construction cooperative, which was organized in 1978, has provided 65 families of blue-collar and white-collar workers of the Nara Sovkhoz with modern houses that have convenient apartment layouts. The domestic conditions and cultural services of the populace in this settlement cede nothing to city housing. Undoubtedly, the creation of such settlements will enlarge considerably the potential for the integrated restructuring of the village.

Nevertheless we still have not achieved the necessary scale of integrated development, and the solution of this task is today most urgent among the many problems of rebuilding the village.

Concrete measures have now been taken to improve the planning of housing and nonindustrial construction in the village, to concentrate capital investment, and to raise the level of integrated development of rural settlements.

The amount of state capital investment and kolkhoz resources that goes into nonproduction construction in the village has grown 1.6-fold for the RSFSR during the 11th Five-Year Plan in comparison with the preceding five-year plan. It is planned to build housing with a total area of about 85 million m². All this will open up good prospects for raising the level of integrated development of the village and for creating in rural communities a sound living environment that will satisfy the rural populace's rising requirements.

With a view to raising the level of industrialization of housing construction in the village, the republic is intensively developing standard designs for low-rise rural farmstead housing within existing series that have been mastered by housing construction enterprises. In so doing, constructional components and parts are being improved and unified, and the materials intensiveness and weight of buildings are being reduced, as is the labor intensiveness of the construction work. Simultaneously, three-dimensional layout and architectural solutions for rural housing are being improved. One can easily be convinced of this by the example of the buildups of the Il'ichevo and Sineborsk settlements in Krasnoyarskiy Kray, where new designs were used that took structure from various industrialized series, structure that was made of local building materials.

The realization of measures for developing completely prefabricated wooden-housing construction is opening up great possibilities for accelerating reconstruction of the village. This promising type of construction in the countryside will become increasingly large in scale as large capacity is introduced at Minlesbumprom [Ministry of Timber, Pulp and Paper, and Wood Processing Industry] enterprises.

In the Russian Federation the industrial base for rural housing construction is being developed at a rapid pace. Its base is comprised of housing construction enterprises that are specialized in the output of sets of 25 and 135 series large-panel houses and also of large-block housing of the 17 series.

Successful assimilation of the design capacity of rural DSK's, the introduction of new enterprises, and the assimilation by them of the whole range of rural-housing designs that they have developed will greatly increase the potential for an integrated buildup of rural settlements. At the same time, the RSFSR has great capacity for large-panel housing construction at urban DSK's. A portion of this capacity can and should be used for the countryside's needs. An important step has been taken in this direction--Gosgrazhdanstroy and RSFSR Gosstroy have developed and approved 38 standard designs for farmstead housing in the more widely disseminated 90, 121, 97 and 83 urban series and other series. The task now consists in urban housing construction enterprises mastering the output of sets of the indicated fully prefabricated rural housing.

Our country has today achieved such economic might that it can simultaneously construct industrial giants such as KamAZ [Kama Motor-Vehicle Plant], Atommasb and the Sayano-Shushenskaya GES, create the largest regional industrial complexes, build the BAM [Baykal-Amur Mainline], do large-scale work in Russia's Nonchernozem zone, and, at the same time, expand the program for a further rise in the people's standard of living. The enormous scale of housing construction previously achieved is being maintained for the near term.

New evidence of the party's and government's constant concern for matters of architecture and large-scale housing construction is organization of the Union of Architects of Russia. It must be considered that the existence of such a creative organization will help to promote more rapid urban development and a rise in the level of architectural expressiveness of development of Russian Federation cities and villages.

The RSFSR's five-year plan for the 11th Five-Year Plan period calls for the introduction into operation of housing with a total area of 300 million m² and the construction of a large number of schools, preschooler institutions and other facilities for social and domestic-amenity purposes.

The Russian Federation's workers and the republic's builders and designers, having undertaken socialist commitments for fulfilling and overfulfilling plan tasks for 1982 and for the 11th Five-Year Plan period as a whole, for purposes of a worthy greeting to the 60th anniversary of the forming of the USSR, are persistently and selflessly toiling on their fulfillment.

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CONSTRUCTION

S. SABANEYEV, CHMN RSFSR GOSSTROY ON RECONSTRUCTION OF THE VILLAGE

Moscow SEL'SKOYE STROITEL'STVO in Russian No 6, Jun 82 (signed to press 10 May 82) pp 1-2

[Article by S. Sabaneyev, Chairman of the RSFSR Gosstroy: "Reconstruct the Village Energetically and Fundamentally" under the rubric "A Worthy Welcome for the 60th Anniversary of the USSR"]

[Text] The Russian Soviet Federative Socialist Republic is one grandiose construction site. Within the united family of the fraternal peoples of the USSR, the RSFSR participates in the nationwide socialist labor competition in honor of the 60th anniversary of establishment of the USSR.

The 26th CPSU Congress, which outlined the branch's strategy for the 11th Five-Year Plan, focused attention on the prompt activation of fixed assets and demanded that means and resources be concentrated on the modernization of existing enterprises while at the same time reducing the number of projects simultaneously under construction. Such a course makes it possible to bring about normalcy in uncompleted construction and increase the effectiveness of capital investments.

As comrade L. I. Brezhnev stressed, the new Five-Year Plan period will provide a major test to builders. The activation of fixed assets must be markedly increased while reducing to a minimum the growth of capital investments.

The increase in labor productivity is inseparably tied to a most rigorous observance of labor, production, and technological discipline, a sharp reduction in losses of work time, and conservation of material resources.

Attaching special importance to this problem, the RSFSR Council of Ministers adopted in July 1981 a special decree, "On Increasing the Volume of Housing and Cultural-Communal Construction in the Kolkhozes, Sovkhozes, and Other Agricultural Enterprises of the RSFSR."

The task posed is to build, already during the 11th Five-Year Plan period, as much housing and children's preschool institutions in the countryside as is needed by each farm to attract sufficient skilled personnel. Plans exist to increase to 22 billion rubles, or by a factor of 1.6 compared with the previous 10th Five-Year Plan period, the capital outlays of the state and kolkhozes on non-production construction.

These outlays are to be spent on erecting housing with an aggregate dwelling area of 69 million sq m. Furthermore, an additional 15.6 million sq m of housing will be built with the cash resources of the population within the system of private and cooperative housing construction, upon appropriately channeling these funds. Thus, 55 well-built dwelling units will be built per farm in this republic.

Along with housing construction, communal, cultural, and shopping construction is being done at an accelerated pace. For example, plans exist to build children's preschool institutions for an enrollment of 515,000 and clubrooms and houses of culture with accommodations for 759,000 persons. During the Five-Year Plan period the construction of water-supply, gas, heating, and sewage systems will have increased by a factor of 2-2.5, which will bring the level of these amenities in the countryside close to that in urban areas.

To provide design blueprints meeting modern requirements for the rapidly growing volume of housing and civic construction in the countryside, the analysis and selection of the best designs for the build-up of rural settlements were carried out and completed in 1981. The most economical and progressive designs of single-story houses of the farmstead type were included in the illustrated zonal "Vash dom" [Your House] catalogs available for every rayon of the RSFSR as well as at most agricultural enterprises. At the same time, the album "Elementy blagoustroystva" [Elements of Housing Amenities] for rural settlements has been published.

An important measure to improve rural build-up was the development of standard designs of one- and two-story houses of the farmstead type by republic and local institutes. During 1980-1981 the RSFSR Gosstroy approved 73 standard designs of rural houses, including 38 designs for private construction. Twenty-five standard designs of rural houses based on structural elements of the 25, 135, and other series fabricated by urban house-building combines have been developed and approved, thus serving to utilize the capacities of these enterprises for the needs of rural construction.

Considerable attention has been paid to the development, revisions, and improvements in the quality of project designs for the layout and build-up of rural settlements, which represent the basis for planning such build-up. Definite progress has been made in the architectural-layout solutions for the build-up of rural settlements. As a rule, the designs provide for a compact build-up with more explicit zoning of areas. The architectural nucleus is becoming more clear-cut, interlocked buildings for cultural and shopping purposes are being used more widely, and the scale of the build-up of civic centers is growing.

But much work is yet to be done to improve rural architecture. Extensive work on blending that architecture with the natural environment is needed.

Production facilities are of increasing importance to the spatial layout of the build-up. In the smaller settlements the silhouette is nearly everywhere perceived to be the principal architectural motif. A skillful vertical design of such pro-

duction facilities as water tanks, silos, boiler-plant chimneys, etc. contributes to enhancing the architectural distinction of a settlement.

A special place in rural architectural design is occupied by the creative utilization of the special features of industrialized house-construction. The diversity of spatial-layout solutions for buildings, their interlocking, and the introduction of decorative wood and concrete elements as well as of textural and color solutions blending with the natural environment warrant expecting creative accomplishments in designing distinguished architecture for modern rural settlements.

The role of socialist labor competition among the collectives of builders in implementing the large-scale program for the reconstruction of the countryside is invaluable.

From the first days of the 11th Five-Year Plan, the subdivisions of the Saratovskaya Oblast Kolkhoz Construction Association became engaged in a sweeping competition under the slogan "Complete the brigade five-year plans ahead of schedule, in four or four and one-half years." It was initiated by the combined-skills brigade of Aleksandr Konstantinovich Danchenko, Cavalier of the Orders of Lenin and Labor Red Banner. His collective each year completes facilities on schedule as well as ahead of schedule, with guarantee certifications. His brigade was the first in the Association to convert to the "podryad" [cost-effective] system.

Experience shows that on farms which devote close attention to housing construction the problem of retaining a stable staff of mechanizers and workers in the other mass trades is successfully solved. Hence, they attain higher indicators in the production of crop and livestock products.

For example, the experience of the Bashkirskaya ASSR deserves emulation. That autonomous republic has fulfilled ahead of schedule its Five-Year Plan with respect to the volume of capital investments and the activation of fixed production assets, schools, hospitals, and other facilities.

In the current Five-Year Plan period extensive work continues to be done on implementing a complex whole of measures to improve the administration of capital construction and fulfill the Decree of the CC CPSU and the USSR Council of Ministers "On Improving Planning and Intensifying the Effect of the Economic Mechanism on the Increase in the Effectiveness of Production and Quality of Performance."

Emulating the pace-setting collectives, it is necessary to provide every condition for increasing the labor productivity of builders. For labor is the sole source for multiplying national wealth. Society can distribute only what has been produced. Hence, the higher the results of labor are, the more the might of the socialist Homeland is growing and the more fully the personal and social needs of the Soviet people are met.

Of major importance to the unfolding of socialist labor competition are the zonal conferences of rural builders.

Last year a seminar-conference on the problems of rural construction in Siberia and the Far East was held in Krasnoyarsk and Sushenskoye. This year an analogous

seminar, on the topic "On Measures to Improve the Comprehensive Build-Up and Amenities of Rural Settlements in the Volga and Central-Chernozem regions of the RSFSR" has been convened in Saratov.

The convening of a RSFSR seminar-conference in that city is fully justified. Saratovskaya Oblast has rightly deserved this honor. In that oblast the level of technical readiness of the enterprises built is so high that the volume of uncompleted construction has been reduced by nearly 300 million rubles and adjusted to the norm. The number of construction sites has been reduced by a factor of one and one-half, and the share of outlays allotted for projects in the final stage of completion has increased.

It is important to note that the construction and modernization of enterprises there are based on a comprehensive approach. The example of the Saratovskaya Oblast builders shows that rural construction and its structure reach qualitatively new levels each year. In particular, the share of housing, cultural, and commercial construction has risen markedly. It is becoming increasingly prefabricated: the volume of offsite-assembled construction is growing, and the network of rural house-building combines is expanding. At these combines, construction is streamlined and integrated, starting with the offsite fabrication of complete sets of components and elements, their shipment to the construction site, and their installation in a condition ready for immediate occupancy.

The participants in the seminar-conference were invited to tour the Saratov Rural House-Building Combine of the Roskolkhozstroyob'yedineniye [RSFSR Kolkhoz Construction Association]. That enterprise has greatly overfulfilled its tasks under the 10th Five-Year Plan in every indicator. The combine built for kolkhozes and shareholding sovkhozes quite a few quality houses of the farmstead type with all conveniences. Their aggregate dwelling area was 234,000 sq m. At that combine, 76 man-days is expended on building a two-family house together with the foundation--this is only one-third of the previous expenditure of man-days.

It is noteworthy that the very pattern of the build-up of central farmsteads has changed in the oblasts of the Volga, Central-Chernozem, and other regions of the RSFSR. Their design is now integrated, with all the utilities and conveniences.

It is important to focus the attention of the seminar-conference participants on the most important things--increasing the effectiveness and quality of construction and completing the transition to a predominantly intensive path of development. The builders should feel deeply responsible for a caring and efficient utilization of the vast potential created by the Soviet people.

Comrade L. I. Brezhnev pointed out at the 26th CPSU Congress: "The intensification of the economy and increasing its effectiveness mean, when translated into the language of practical deeds, primarily a faster increase in the effects of production, such that the outlays of production entail consuming comparatively fewer resources and produce greater results."

The experience of rural builders in the Volga, Central Chernozem, and other regions of the RSFSR demonstrates that equipment and technologies should be, as before, universally and persistently perfected. In this connection, it is not

at all mandatory to erect expensive buildings for new types of production. It is much more rapid and cheaper to renovate equipment and refine technology at existing enterprises so as to enhance the yield of fixed assets.

It is necessary to reliably promote a rise in labor productivity and skillfully combine socialist resourcefulness with a thrifty attitude.

It must be bluntly stated that the tasks posed at our seminar-conference are complex, and that the volume of planned housing construction is unprecedented--but wholly realistic. Every autonomous republic, kray, and oblast disposes of large construction organizations. Considerable potential is present in urban house-building combines, whose capacities are far from fully utilized. Much also can be accomplished by patron organizations. Instructive in this respect is the experience of Moscow, Leningrad, and other cities.

Tours of new housing projects and showings of films dealing with the experience in comprehensive build-up of settlements in the Saratovskaya and Gor'kovskaya oblasts and Krasnoyarskiy Kray are being organized for the seminar-conference participants.

The experience of the RSFSR Ministry of Rural Construction and the Roskolkhozstroy-ob'yedineniye shows that the most promising direction in construction is that of the all-out development of rural construction combines and house-building combines, which should install, finish, and release houses for immediate occupancy. The construction of houses by the "podryad" method is growing markedly, along with an increase in the output of prefabricated wooden houses and sets of components for houses built from local building materials.

However, the construction done by the farms themselves with their own resources should not be disregarded either. It is necessary to improve the supply of building materials and equipment for farms.

The practice of the formation by kolkhozes and sovkhoses of their own permanent construction brigades has also fully justified itself, as has the practice of promoting the interest of the rural population in building its own homes and beautifying their communities.

It is necessary to consider the experience, and draw lessons from the results, of the All-Union Contest for the Sovkhoz and Kolkhoz Settlements With the Best Build-Up and Amenities in 1981.

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CONSTRUCTION

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CONSTRUCTION OF GANTRY CRANES AT 'ATOMMASH' PLANT

Moscow MONTAZHNYYE I SPETSIAL'NYE RABOTY V STROITEL'STVE in Russian No 5, May 82
(signed to press 26 Apr 82) pp 13-14

[Article by Engineers V. D. Vorob'yev and D. B. Shevchik (Rostov Section of Giprotekhnmontazh): "The Erection of Traveling Gantry Cranes at the Dock of the 'Atommash' Plant"]

[Text] A dock equipped with two traveling gantry cranes with a load-lifting capability of 630/50 tons each has been built for shipping completed reactors that have been manufactured at the Atommash plant. The cranes were designed and manufactured at the Zhdanovtyazhmash plant and have the following specifications:

Load-lifting capacity, tons.....	630/50
Span, meters.....	25
Base, meters.....	9.4
Full height, meters.....	31.9
Weight, tons.....	704.6
Maximum height of load lift, meters.....	30

The basic members of the crane's metal structure--crossbar and supports--were made of box section. Under the plant's plans the structure should have been delivered in seven shipping sections. The crossbar members were designed to be

joined on the basis of high-strength bolts, the other members on the basis of welding. One of the main prerequisites for reliability of joints based on high-strength bolts is a minimal time interval between treatment of the surface and placement of the bolts. As experience in the assembly of cranes of similar design has shown, making joints based on high-strength bolts involves a number of difficulties. The crossbar should be fastened to the supports with 1,624 high-strength bolts at a height of 23 meters, under conditions of increased dampness.

After acquainting themselves with the gantry crane's design and examining the options for its erection, the Rostov Section of Giprotekhnmontazh proposed to change the crane's design and the prerequisites for its shipment, calling for a consolidation of its components, to be assembled by means of KS-8161 crawler cranes with a load-lifting capacity of 100 tons. In this case the gantry should be shipped in 5 pieces, including the entire crossbar, which rests on top of the supports (figure 1). Zhdanovtyazhmash, after a close examination of the institute's proposal, considered it rational and suspended fabrication of the gantry crane, pending reworking of the drawings. Later work on fabrication and shipment of the crane was performed in accordance with Giprotekhnmontazh Institute recommendations. While developing the PPR [work plan] with Zhdanovtyazhmash, places were agreed on for the

attachment of devices for slings on the crane's supports, crossbar and loading dolly. The plant took on itself the job of strengthening the attachment points.

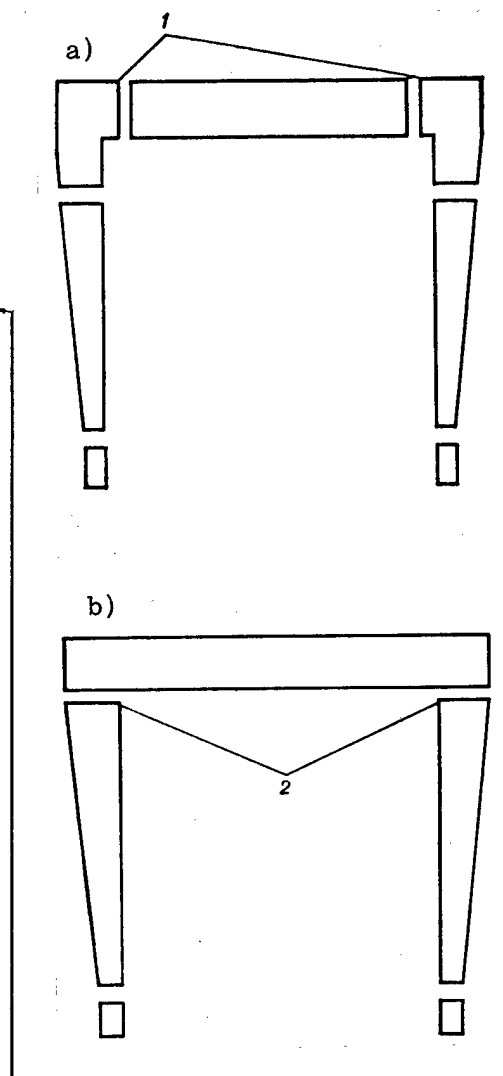
Figure 1. Diagram of Breakdown of a Gantry of a Crane into Shipping Members.

- a. In accordance with the Zhdanovtyazhmash plant design.
 - b. In accordance with the Giprotekhnmontazh proposal.
1. Joints based on high-strength bolts.
 2. Joints based on welding.

The consolidating erection of the crane's supports, the manipulation of the crossbar, which came by rail in an upside-down position, the installation of electrical equipment inside the crossbar, and the assembly of the loading dolly, which was 11.5x9.3 meters in plan layout, weighed 160 tons and was shipped disassembled, were performed in building No 1 of the Atomash plant with the help of an operating bridge crane. The assembled components were transported to the dock over a distance of 10 km on transporters (figure 2 [not reproduced]). They were unloaded by KS-8161 cranes.

The cranes were assembled in large-module fashion in the summer of 1981 by an installers' brigade from RMU-2 of Yuzhtekhnmontazh Trust, which was under USSR State Prize winner V. I. Krymov. The crane was assembled in this sequence. Components of the crane-moving mechanism were installed on the crane tracks. The weight of the heaviest component--the drive balancer--was 27 tons. The balancers were checked along the vertical and then strengthened with a number of props. Next the supports were erected, in turn. The supports were put into the vertical position by the hinge-turning method by the two KS-8161 cranes, and then, lifting each support above the ground, the cranes set them on the locomotion mechanism. The supports were guyed by ropes with a diameter of 28 meters [as published] to ground anchors that were ballasted with steel stock weights. The tension members were packed by electric winches through tackle blocks.

The two KS-8161 cranes, equipped with 30-meter booms (figure 3 [not reproduced]), lifted the 100-ton crossbar and placed it on the supports. The tackle blocks were made fast with clamps that the Zhdanovtyazhmash plant had welded on in accordance with the Giprotekhnmontazh task. After a geodesic check on the gantry had been made, the joints of the crossbar were welded to the supports. The gantry of the second crane was erected in the same sequence as the first. After finishing erection of both gantries, the KS-8161 crawler cranes were reequipped with 40-meter booms and installed between the two assembled gantries, and the booms were braced.



The 160-ton loading dolly of the traveling gantry crane was raised up as a unit with the wall enclosures of the machinery compartment, which enabled an outside joint, which unites the wall with the floor of the machinery compartment, to be welded underneath. The dolly also was slung without the help of cables, with the transmission of forces by two cranes through a specially designed and fabricated strut-frame type crosspiece 12.5 meters long, with a load capacity of 160 tons. The crosspiece was made from welded and seamless pipe 530x10 mm, 325x8 mm and 219x8 mm. After lifting the dolly to a height above that of the gantry, the gantry was moved under the raised dolly, which was then lowered onto the dolly rails. The gantry, with the dolly installed, was moved forward, the booms of the KS-8161 cranes were lowered, and then the second gantry was moved to the designed site, and the cranes' booms were raised and a dolly was installed. The measures taken, in comparison with the original variant for delivering the crane, yielded a saving of 46,000 rubles during assembly of the two traveling gantry cranes and reduced their installation time by almost a month.

The work done to erect the traveling gantry cranes with a lifting capacity of 630/50 tons enables the following recommendations to be made. In preparing such structures for erection, when the PPR is being developed the prerequisites for delivery should be coordinated with the design bureaus and the plants, with a view to simplifying and facilitating assembly. Structures should be erected from modules that have been consolidated to the maximum on the ground, using heavy-duty self-propelled cranes.

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CONSTRUCTION

MODEL-DEMONSTRATION CONSTRUCTION SITES

Moscow PROMYSHLENNOYE STROITEL'STVO in Russian No 5, May 82 (signed to press 22 Apr 82) pp 5-6

[Article by USSR Gosstroy subdepartment chief I. I. Koss and USSR Gosstroy senior engineer V. A. Dubinin: "Initial Work Results for the Country's Model-Demonstration Construction Sites"]

[Text] With a view towards the broad practical introduction of the most effective forms and methods of organizing construction production, the achievements of science and engineering, and leading domestic and foreign construction experience and, on that basis, ensuring successful fulfillment of assignments on putting capacities and projects into operation, mastering construction-installation work limits, labor productivity growth and other technical-economic indicators, the USSR Gosstroy adopted a resolution in 1981 on organizing 11 model-demonstration construction sites, including three in the USSR Ministry of Construction of Heavy Industry Enterprises, four in the USSR Ministry of Industrial Construction, three in the USSR Ministry of Construction and one in the Ministry of Construction in the Far East and Transbaykal Regions.

PROMYSHLENNOYE STROITEL'STVO (No 8, 1981) has already published the first materials on the model-demonstration construction projects in editorials and informational articles under the heading "In the USSR Gosstroy," presenting the main provisions on their organization and a list of the construction sites.

Very important construction projects of the USSR Ministry of Ferrous Metallurgy are among the model-demonstration projects: Oskol'skiy Electrometallurgical Combine, the metallurgical plant imeni Il'ich in Zhdanov and a small facility at Komsomol'sk-on-Amur; Ministry of Construction of Heavy Industry Enterprises: Krasnoyarsk Heavy-Duty Excavator Plant; Ministry of Power Machinebuilding: Izhor'skiy Plant imeni A. A. Zhdanov; Ministry of Machine Building for Animal Husbandry and Fodder Production: "Gomsel'mash" plant; Ministry of Chemical Industry: "Orgsintez" production association in Kazan'; USSR Ministry of Installation and Special Construction Work: the Baku Stationary Deep-Sea Foundations Plant.

About a year has passed since the model-demonstration construction projects were organized. What has been done along this line by the USSR Gosstroy, the construction ministries, client ministries and other concerned organizations and

participants in the model-demonstration construction? How are the goals and tasks set being met at the construction sites?

The USSR Gosstroy developed, approved and, as of 1 September 1981, disseminated to the ministries and departments and the model-demonstration construction sites a "Temporary Regulation on the Model-Demonstration Construction Site" for guidance.

A brief description of the main criteria and requirements of model-demonstration construction sites:

- high level of organization, technology, mechanization and standards of construction production;

- top-priority provision of the projects being built with skilled worker personnel, experienced leaders and engineering-technical workers, as well as material-technical resources;

- complete and prompt provision of complete sets of high-quality estimate-planning and organizational-technological documentation -- construction organization plans, work plans, flow charts and labor-process charts -- under the established procedure;

- extensive introduction of progressive forms of labor organization, including the integral-process flow-line brigade contract;

- efficient use of construction vehicles and machinery, equipment and means of transport;

- smooth delivery of complete sets of building components, items and materials, technological equipment, cable, wire and assembly components;

- a high level of cultural- and personal-services and housing conditions for those working at model-demonstration construction sites;

- efficient and economical expenditure of building materials and fuel-energy resources;

- extensive development of socialist competition among the collectives of model-demonstration construction sites for improved work efficiency and quality.

With a view towards generalizing the leading experience accumulated at the model-demonstration construction sites and extensively introducing leading forms and methods of construction production organization and progressive technological processes at them, the USSR Gosstroy, with the participation of the USSR Ministry of Construction of Heavy Industry Enterprises and the Krasnoyarskiy Kray party committee, held an All-Union Scientific-Technical Seminar on "Experiences of Leading Construction-Installation Organizations at Model-Demonstration Construction Sites" in Krasnoyarsk on 3-5 September 1981. The recommendations adopted at the seminar were aimed at further improving model-demonstration construction.

The construction ministries have taken appropriate steps to organize model-demonstration construction: orders have been issued for organizing model-demonstration construction sites, organizational-technical measures on introducing leading forms and methods of construction production organization, the achievements of science and engineering, leading domestic and foreign experience, into construction practice, and measures on the top-priority provision of construction sites with full complements of labor and material-technical resources.

The USSR Ministry of Industrial Construction used the model-demonstration construction projects of "Orgsintez" production association in Kazan' to conduct a school of leading experience on the topic "Improving the Organization of and Analyzing Experience in Model-Demonstration Construction in the USSR Ministry of Industrial Construction" in August 1981.

As checks made in 1981 and in January-February 1982 on-site by leaders and specialists of the USSR Gosstroy, jointly with representatives of the construction ministries and client ministries, showed, construction of facilities at "Gom-sel'mash" plant (USSR Ministry of Industrial Construction), the plant imeni A. A. Zhdanov in Izhorskiy (USSR Ministry of Construction), the "3000" mill at the Zhdanovskiy Metallurgical Plant imeni Il'ich (USSR Ministry of Construction of Heavy Industry Enterprises) and a number of others is being done at the proper organizational-technical level, with the use of leading and effective forms and methods of organizing construction production and worker labor. Thus, construction of "Gom-sel'mash" plant (USSR Ministry of Industrial Construction) is using the "junction" [uzlovoy] method; technology has been introduced for installing mosaic-tile floors using surface-active substances; fiberglass-reinforced cement and polymer-fiberglass waterproofing and a bitumen-free chemically-stable waterproofing mastic are being introduced; the technology has been mastered for installing mosaic and concrete floors using vibration-vacuum; the most labor-intensive plastering and painting work is being mechanized with highly-productive machinery. Buried facilities are being installed by putting caissons into thixotropic sleeves. All brigades are working under brigade contract and have been fully supplied with standard sets of machinery, tools, attachments and fittings.

The facilities being built at the Izhorskiy Plant imeni A. A. Zhdanov (USSR Ministry of Construction) have been supplied with complete work plans; the construction site is introducing progressive work methods such as the use of panel-board sheathing made of bakelite veneer, metal forms (block forms) to install foundations under building frames, driven piles, conveyor-line assembly and installation of 24 x 24 meter roof sections, use of consolidated reinforced modules for foundations for technological equipment, prefabricated reinforced concrete sealed box-type blocks for cable and pedestrian tunnels and prefabricated I-shaped uptake duct units; it is experimentally building foundations in compacted pits.

Construction of the "Gom-sel'mash" (USSR Ministry of Industrial Construction), Izhorskiy imeni A. A. Zhdanov (USSR Ministry of Construction) and Zhdanovskiy Metallurgical imeni Il'ich (USSR Ministry of Construction of Heavy Industry Enterprises) plants most fully meet the demands made on model-demonstration construction projects in terms of organizational-technical level, equipment and indicators achieved in 1981.

As a result of implementation of measures to organize model-demonstration construction, the above-indicated construction sites put capacities and projects into operation on schedule and met construction-installation work volume assignments in 1981. The rates of labor productivity growth at the model-demonstration construction sites has generally been above average.

The assignments set in 1981 were met in terms of construction-installation work volume at facilities at the Baku Stationary Deep-Sea Foundations Plant (USSR

Ministry of Industrial Construction), the small metallurgical plant in Komso-mol'sk-on-Amur (Ministry of Construction in the Far East and Transbaykal Regions) and the experimental housing region in Gor'kiy (USSR Ministry of Construction).

We should note the positive experience in creative cooperation between the Glavkrasnoyarskstroy and Promstroyeniiprojekt of the USSR Ministry of Construction of Heavy Industry Enterprises, the directorate of the enterprise under construction and the Ural'sk Giprotiyazhmash of the Ministry of Heavy and Transport Machinebuilding, and the USSR Gosstroy's Promstroyproyekt in coordinating procedures for preparing, beginning with the initial planning stage, model-demonstration construction of the Krasnoyarsk Heavy-Duty Excavators Plant on the basis of three main principles:

- a target-program approach to the construction which anticipates unified coordinated actions by all participants in creating the industrial complex in the planning and set-provision stages, of all levels of management and all stages of construction;

- a high degree of construction industrialization, transforming construction production into an uninterrupted, mechanized process of assembling and installing buildings and facilities using fully factory-finished elements;

- maximum coincidence of planning and construction schedules.

At the same time, checks have shown that the construction ministries and the leaders of a number of construction sites had still not taken the necessary steps in 1981 to promptly carry out measures concerning the organization of model-demonstration construction which were aimed at further perfecting construction production organization, providing projects under construction with skilled worker cadres and engineering-technical personnel, and prompt deliveries of metal and prefabricated reinforced concrete components and building materials.

Construction ministry enterprises underfulfilled reinforced concrete components delivery assignments for projects at the Krasnoyarsk Heavy-Duty Excavators Plant, Vladimirskiy Tractor Plant and the Baku Stationary Deep-Sea Foundations Plant.

Assembly-component organizations of the USSR Gosstab and enterprises of the USSR Ministry of Ferrous Metallurgy permitted a significant underdelivery, in terms of the funds allocated, of rolled metal products to model-demonstration construction sites and USSR Ministry of Installation and Special Construction Work plants manufacturing metal components for these construction sites in 1981.

Housing construction plans are being carried out extremely unsatisfactorily at a number of model-demonstration construction sites, which is the main reason for the shortage of worker personnel at these sites. Thus, for example, given a 1981 housing starts plan of 135,000 square meters for the Krasnoyarsk Heavy-Duty Excavators Plant, only 29,000 square meters, or 21.5 percent, was actually put into operation.

An extremely difficult housing situation has developed for construction and installation workers at the Oskol'skiy Electrometallurgical Combine construction site due to systematically inadequate allocation of capital investments for housing construction in comparison with the amounts anticipated in the agreed-to measures.

Neither have the client ministries taken the steps necessary to organize model-demonstration construction. Thus, the USSR Ministry of Ferrous Metallurgy has not provided complete technical documentation for the construction of facilities at the metallurgical plant in Komsomol'sk-on-Amur and is late in demolishing existing housing structures on the construction site; the composition of the start-up complex of the Oskol'skiy Electrometallurgical Combine pelletizing shop was not adjusted and brought into line with the capital investments allocated for 1982.

The Ministry of Heavy and Tractor Machinebuilding has not ensured the prompt provision of start-up projects of the Krasnoyarsk Heavy-Duty Excavators Plant with complete sets of technological and power equipment.

Not all model-demonstration construction sites were changed over in 1981 to comprehensive materials supply through territorial material-technical supply agencies on the basis of construction organization orders in accordance with their requirements as determined by the estimates and plans, as was anticipated by the measures.

Due to these and other shortcomings in organizing model-demonstration construction in 1981, capacities at the Novokuybyshevskiy Petrochemical Combine, "Orgsintez" production association in Kazan' (USSR Ministry of Industrial Construction), Krasnoyarsk Heavy-Duty Excavators Plant (USSR Ministry of Construction of Heavy Industry Enterprises), and a number of construction sites did not fully utilize the annual construction-installation work limits.

This situation in organizing model-demonstration construction sites resulted from insufficient work by ministries and departments, the construction organizations of client enterprises and assembly-component agencies on ensuring fulfillment of the measures anticipated concerning the organization of model-demonstration construction. It should also be noted that the fact that the organization of model-demonstration construction sites in 1981 was done in mid-year, when the material-technical resources had already been distributed among the ministries, enterprises and construction sites was also reflected in the negative work results of the construction sites.

With the participation of the leaders and responsible representatives of the construction ministries and client ministries, the USSR Gosplan and USSR Gosstrib, the USSR Gosstroy reviewed the state of affairs at each model-demonstration construction site in February 1982 in terms of 1981 work results and outlined specific measures to eliminate existing shortcomings and further perfect model-demonstration construction in 1982.

The organization of model-demonstration construction sites is a multifaceted task whose resolution requires a comprehensive approach and high organization in the actions of all construction participants.

The work experience of the leading construction sites proves that good results are obtained when economic leaders, party and trade-union organizations do their organizational work on perfecting construction production, introducing leading experience and the achievements of science and engineering daily and purposefully, when the scientific-technical and trade-union community and all laborers are involved in it.

It is a matter of honor for construction workers, clients and all participants in organizing model-demonstration construction to succeed in transforming each model-demonstration construction site into a model (benchmark) for extensive repetition, into a school of leading experience in construction production organization and high standards which meet all the demands and criteria being placed on them in 1982.

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BUILDING MATERIALS

CONSTRUCTION INDUSTRY PROBLEMS

Minister USSR Construction Materials Industry on Materials

Moscow EKONOMICHESKAYA GAZETA in Russian No 25, Jun 82 (signed to press 14 Jun 82) p 2

[Interview with Minister USSR Building Materials Industry A. I. Yashin by EKONOMICHESKAYA GAZETA: "Construction Sites Need Highly Effective Materials"]

[Text1 [Question] Aleksey Ivanovich, please tell us about the branch's participation in the implementation of the USSR Food Program.

[Answer] That implementation is inseparably tied to the fulfillment of a huge volume of the construction of production premises and social and communal facilities in the countryside. This requires extensive material resources. For example, last year agriculture was supplied with 25 million tons of cement and, in addition, the organizations of the Tsentrosoyuz [USSR Central Union of Consumers Societies] received 1.6 million tons for sale to the population. The overall volume of glass supplies to the countryside was nearly 69 million sq m--26 percent of the country's entire output of glass; slate, 4.3 million conditional tiles, or 58 percent of entire output; soft roofing materials, 547 million sq m, or 32 percent of entire output. In the immediate future, these deliveries will still further increase.

Our branch also manufactures a number of special products designed for agricultural production. These primarily include ground limestone (dolomite) whose use is a major factor in increasing crop yields on vast tracts of land. After all, more than 50 million hectares of acidic soils require liming.

It should be emphasized that the industrial production of ground limestone has in the last 12-15 years been almost completely reorganized. The output of lime materials at enterprises of the system of the USSR Ministry of Building Materials has risen from 10 million tons in 1970 to 22 million in 1981, and in 1985 it is scheduled to reach 33 million tons.

The production of ceramic pipe for closed drains in bogged and overhumidified soils has also been reorganized. New large plants have been put into operation in many oblasts of the RSFSR and the Baltic Region. The total output of such drain pipe has increased from 316,000 conditional km in 1970 to 538,000 in 1981, and for 1985 it is scheduled to reach 736,400 conditional km. We hope that the

Ministry of Railroads [MPS] will take into account the rapid rise in the output of important products at our enterprises and provide more rolling stock for ground limestone and drain pipe.

In addition, asbestos-cement pipe and fiberglass also are being supplied in large quantities for land-reclamation work. Moreover, building materials enterprises provide glass canning jars for food-industry enterprises as well as window glass for agricultural equipment.

[Question] What is the situation with the development of subsidiary farms at the branch's enterprises?

[Answer] The collectives of our enterprises display signal initiative in setting up and developing their subsidiary farms. There already are about 400 such farms within the branch. Subsidiary farms provide large quantities of foodstuffs--meat, milk, vegetables, and potatoes--for plant canteens, kindergartens, and nurseries, as well as for sales to the inhabitants of workers' settlements.

Measures are now scheduled to expand the existing subsidiary farms and establish new ones. Preliminary estimates show that these farms will, toward the end of the Five-Year Plan period, produce annually about 6,000 tons of meat, 5,200 tons of milk, 5 million eggs, and 18.5 million tons of potatoes and vegetables. In response to the decisions of the May (1982) Plenum of the CC CPSU, many enterprises already are drafting additional measures to expand output on subsidiary farms.

[Question] What is the USSR Ministry of Building Materials Industry doing to better satisfy the needs of construction sites for new more effective products?

[Answer] In the past Five-Year Plan period the output of effective products has been rising at a fairly rapid rate, having on the whole doubled while the output of the branch increased by 12.9 percent. In absolute figures, however, the volume of output of a number of progressive materials is definitely inadequate. The production of certain new gypsum and mineral-wool products is growing slowly. The output of quality aggregates, especially for lightweight concrete, is insufficient. For this we were justly criticized at the All-Union Conference on the Conservation of Material Resources in Construction. We regard it as our duty to rectify the situation already in the immediate future. Let me cite but a few examples.

The organization of the production of asbestos-cement panels by the extrusion method will serve to manufacture multiple-hollow lightweight partition panels for walls, floors, and floor partitions. Their use in construction reduces to one-third or one-fourth the weight of structures compared with the traditional weight and drastically reduces the consumption of metal. The variety of glass and ceramic finishing materials is being significantly broadened. During the Five-Year Plan period the output of double windowglass sets will increase by a factor of 4.4.

A complex whole of measures is being planned to develop broadly the fabrication of gypsum products. Thus, the output of improved-quality gypsum-cardboard sheeting is to be increased to 22.5 million sq m (or by a factor of nearly 9). Moreover,

this increase in output is being accomplished chiefly by means of a radical modernization of the existing enterprises.

[Question] In your opinion, how can the mass production of new building materials be accelerated?

[Answer] For the branch as a whole, during the Five-Year Plan period the output of new effective materials and products is scheduled to increase by a factor of 2.2 whereas the overall increase in all output is to reach 15.7 percent. The output plans for some of these products can be exceeded. But this requires support from the planning and supply agencies and co-producing branches. We have, for example, underutilized capacities for the fabrication of linear polymeric materials, washable wallpapers and coatings, plumbing fixtures and fittings, and nonwoven carpeting, owing to shortages of raw materials. The Ministry of Chemical Industry is slow in expanding its production of synthetic resins and dyestuffs. Moreover, the available stocks are distributed by agencies of the USSR Gosstob without taking into account the priority needs of specialized enterprises and types of production.

Attention should also be drawn to the circumstance that the economic effects of the increase in the output of new materials are attained chiefly through their use in mass construction. But to this end the standard designs of residential and civic buildings should provide for the use of these materials. In practice, however, this is often done only after considerable delays.

Thus, owing to the absence of mandatory project-design documentation, various new building materials have long been not adequately used; for example, certain improved types of plumbing fixtures and new glass and ceramic materials. Naturally, in a number of cases this deprives enterprises of the incentive for updating the variety of their output, and sometimes they operate at a loss. The USSR Gosstroy should attend to providing conditions that would stimulate the interest of both industry and builders in using effective materials and products.

[Question] Surely a considerable potential for conservation is latent in the technology itself of the production of building materials....

[Answer] A major trend toward the conservation of fuel in the--most energy-intensive--cement industry is the further development of the dry process of production. Plans also exist to introduce the semi-dry process of producing cement upon the installation of filter presses for extensive dehydration of slurry, which will produce savings of as much as 20 percent of fuel.

Of basic importance is improving the utilization of mineral raw materials and establishing comprehensive and combined types of production with maximum utilization of industrial wastes. Each year our branch consumes about 45 million tons of the secondary resources and wastes of other types of production--granulated blast-furnace slag, the ash-and-slag wastes of thermoelectric power stations, phosphogypsum, pyrite cinder, broken glass, waste paper.

Recently we made definite progress in utilizing the wastes of coal concentration, especially in brick production, which markedly reduces fuel consumption while at the same time improving production quality. However, the scale of the work in this direction is as yet insignificant.

This raises a large number of problems which should be solved by the USSR Gosstroy and the GKNT [expansion unknown]--and by the former in cooperation with all concerned ministries and departments. This concerns the development of facilities for the primary processing of industrial wastes (dehydration, granulation, etc.), the provision of appropriate equipment and means of transportation, and the drafting of technological recommendations and requirements, as well as the provision of material incentives.

[Question] How do you assess the work to improve the economic mechanism in the branch's enterprises?

[Answer] Since the beginning of the year the building materials industry--with all its sub-sectors and enterprises--has been completely converted to the planning and evaluation of production performance according to the indicator of normative net output. Research, design, project-design, and other organizations, as well as production associations and enterprises have been converted to the cost-effective system of work to design, develop, and introduce new equipment on the basis of orders placed (contracts). A unified fund for the development of science and technology has been set up. The principal targeted comprehensive programs for the 1981-1985 period have been approved.

Bonuses for workers of production associations and enterprises have been made dependent on qualitative indicators of performance: increase in labor productivity; share of output in the higher quality category; conservation of fuel-energy, material, manpower, and financial resources; and reduction of production cost. The enterprises were assigned stable criteria for the establishment of incentive funds for the Five-Year Plan period.

The measures taken contributed to some improvement in the performance of the branch's enterprises.

But the work to improve the economic mechanism still has not adequately affected an increase in the effectiveness of production and attainment of high end-results. This is principally due to--as pointed out by Leonid Il'ich Brezhnev at the November (1981) Plenum of the CC CPSU--the slow half-way implementation of the measures intended in this field.

[Question] How is this reflected in your branch, by way of an example?

[Answer] There is the alarming steady lag of a number of plants in fulfilling the targets as regards NChP [Expansion unknown] and the output of certain types of products. New capacities are still being put into operation too slowly, and labor productivity within the branch is rising at an inadequate rate. Justified complaints are being received about the quality of materials, especially local ones--bricks and concrete aggregates. All this is chiefly traceable to omissions in the organization and control of production.

The demand that the role of the Five-Year Plan in the entire planning system be enhanced has not been completely fulfilled. In our industry, in particular, many tasks remain not linked to material, equipment, and financial resources.

The existing procedure for granting incentive funds is too complex, which largely reduces their effectiveness. In our opinion, the fund for the development of industry has lost some of its stimulating effects.

It should also be pointed out that the continuing broadening of the variety and quantity of indicators considered and approved by the USSR Gosplan fetters the initiative of ministries and enterprises and obstructs an adequate solution of many problems of the branch's development. The volume of calculations accompanying the plan drafts submitted to the USSR Gosplan is rising. This burdens too much the enterprise workers and distracts many experts from direct production control.

The brigade forms of the organization and remuneration of labor at present encompass about 500,000 workers at our enterprises or nearly 60 percent of the total work force. Within such collectives as the Akmyanskoye Cement-Slate Production Association, the Dnepronerudprom, the Osipovichskiy Cardboard and Ruberoid Plant, the Sayanmarmor [Marble] Combine, and the Kovrovskoye Quarry Administration, the path of establishing comprehensive combined-skills brigades was chosen--these brigades comprise workers in various skill categories over two or three work-shifts. Experience shows that this method reduces the losses of work time in between the work-shifts and increases the utilization of equipment. The Ministry is taking various measures to further propagate this experience, to increase labor productivity 10-15 percent, and to improve other technical and economic indicators.

In the course of the socialist labor competition in honor of the 60th anniversary of establishment of the USSR, the branch's labor collectives exert every effort to fulfill their counter plans and pledges adopted for 1982.

Bricks Broken in Port, Unusable

Moscow EKONOMICHESKAYA GAZETA in Russian NO 25, Jun 82 (signed to press 14 Jun 82) p 17

[News item by L. Arikh, with photograph (not enclosed)]

Bricks lie in chaotic piles although empty hand-truck platforms stand idle nearby....This picture can be seen in the area of the Tobol'sk River Port (Tyumenskaya Oblast).

The wasteland of brick rubble belongs to SU-36 [Construction Administration No 36] of the Tyumen'gazpromstroy [Tyumen' Gas Industry Construction Trust]. It cannot be said that people's controllers and Komsomol inspectors are blind to this mismanagement. It is the administration that does not respond to their reports.

The engineer-technologist G. Kupryanova from the Sukholozhsk Cement Combine said: "Unfortunately, this is not the sole example by which to judge the attitude toward

building materials. Entire stacks of cement are lying under the open sky in the port area. Is not it time to bring order into these things?

Inferior Materials Hamper the Construction of Balakovo AES

Moscow SOVETSKAYA ROSSIYA in Russian 30 May 82 p 1

[Article by A. Chernenko, SOVETSKAYA ROSSIYA correspondent, Balakovo: "How to Answer the Brigade Leader?" under the rubric "A Report from Our Correspondent at Balakovo AES"]

[Text] The chief engineer at the Saratovgesstroy [Saratow State Electric Power Plant Construction Trust] A. I. Savkin, carrying a lump of metal in his pocket, haunted the offices of the USSR Ministry of Ferrous Metallurgy. Finally, he was received by Deputy Minister A. A. Kogadeyev.

Savkin placed the lump of flaky pastry pie-like steel on the desk and asked "What are we to do?"

The deputy minister asked, "Is all output like that?"

"All."

Then A. Kogadeyev immediately called his subordinates.

Having received his instructions, the chief engineer at the Soyuztrubostal' [All-Union Steel Pipe Trust] just as rapidly informed Savkin:

"We're dispatching a competent expert to you. Wait for him."

But the persistent customer decided to meet personally those responsible for the defective metal. However important it was to determine what happened, it was still more important to obtain quality metal for the construction project. The chief of the production department at the plant responsible for the defective metal, B. I. Spivakovskiy, swore an oath:

"You'll get the metal. And we shall reprocess the defective metal."

Thus, three authoritative promises were given: the deputy minister, the chief engineer at the Soyuztrubostal', and, lastly, a manager at the supplier plant--they all gave firm guarantees that they would rectify the situation as soon as possible.

Encouraged by his initial success, the chief engineer at the Saratovgesstroy hurried to the USSR Ministry of Special Construction and Installation Operations, whose Belgorod plant supplied unsuitable pipe to the builders of the Balakovo AES [Atomic Electric Power Station]. He could not carry along that pipe to the office of the chief engineer of the Soyuzstal'konstruktsiya [All-Union Trust for Steel Structural Elements], V. M. Vorob'yev, because it was just too big. But he did bring documentary proofs.

"Vladimir Mikhaylovich, we inspected your pipe ultrasonically and it turned out to be completely defective. It also has flaws that can be seen with the naked eye. Moreover it is not made of the modification of metal envisaged in the design. After all, this concerns the building of an atomic power station!"

The chief engineer of the Soyuzstal'konstruktsiya hastily declared: "We shall send competent representatives to investigate the matter on the spot."

The encouraged petitioner returned home fully confident in the success of his mission. But... the USSR Ministry of Ferrous Metallurgy sent neither competent experts nor metal. Representatives from the USSR Ministry of Special Construction and Installation Operations came and fidgeted around their defective pipe and then quietly departed. Rusting pipe lies in the depots of the Saratovgesstroy--tons of defective pipe costing thousands upon thousands of rubles. These unfit supplies officially figure as regular supplies in the reports, but the construction of the AES is already lagging considerably behind schedule. In the absence of metal, the lag is growing.

A. I. Savkin said: "Last February the heads of the USSR Ministry of Special Construction and Installation Operations promised that the Balakovo AES will receive more than 800 tons of metal during the first half of the year. But it is now May and nothing at all has been received. And as for the shipments from the Belgorod Plant, which incidentally made up for the lag in their shipments last year, they are completely unsuitable."

Hortatory telegrams are being sent from the top to the bottom, and oaths and assurances are being sent from the bottom to the top, but no one yet has done anything about the defective supplies. These days more than 10 suppliers of the Balakovo AES construction project are providing defective supplies.

The well-known brigade leader N. P. Derkach told me: "Do you know yet another adverse effect of these defective supplies?" He was tossing on his palm the unfortunate lump of metal. "It is ruining the mood for work. Guys come to me and tell me: 'You're a Hero of Socialist Labor. The ministers will talk with you. How about asking them why does it happen that such supplies are being delivered to the atomic power station project?' What can I answer them?"

We are addressing the brigade leader's question to the heads of the USSR Ministry of Ferrous Metallurgy and the USSR Ministry of Special Construction and Installation Operations.

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METALWORKING EQUIPMENT

LABOR PRODUCTIVITY CONTRASTS

Moscow SOTSIALISTICHESKAYA INDUSTRIYA in Russian 1 Apr 82 p 2

[Article by B. Markov (Saratov): "Stimuli...Brakes"]

[Text] M. Bushuyev, head of the administration for labor organization, wages and personnel of the Ministry of Construction, Road and Municipal Machinebuilding, speaks with alarm about the shortage of machine tool operators in the branch. "It must be remembered, after all, that we are poor relations among machinebuilders," explains Mikhail Mikhaylovich. "It is hard for us to compete in terms of wages and social services, and so, given the current demand for workers, a lathe operator working for us yesterday is often sent today to another plant gate."

The machining sectors at the Saratov Construction Machinery Plant have lost half their people over the last 10 years. There are now not enough machine tool operators to work the equipment at full load for even one shift. Machine shop chief V. Sel'skovyy and I racked our brains over this problem, with its three "knowns." According to the plan for this year, the work volume is to be increased by eight percent; the shop has assumed an obligation to increase labor productivity by only four percent; and rather than getting more people, there will be even fewer. The question is, how much output will the shop, and consequently the plant, be short by the end of the year?

The shop chief even seems to be hurt by this turn of events. "But last year, when we got help, the shop almost coped with the plan."

What is the reference to? The plant lacks workers, so its leaders posed its customers these terms: if you want assembly components, send us machine tool operators. Metalworkers were sent here several times last year from Moscow and Priluk, Rzhev and Nyazepetrovsk. This "cooperation" in machinebuilding has managed to acquire a rigid code: so long as the norm-hours assignment is not met, output is not shipped out.

Achieving norm-hours has become a first-order task for the enterprise. Director V. Korzhov imparts the news: if they "open up" another few people from the customers they will work to the end of the year. They have even managed to set aside a portion of the machining.

"What else can we do?" he says. "Year after year, we put this question to the ministry: in order to solve the personnel problem, we need a well-equipped new shop, we need more housing funds, we need to build a vocational-technical school and, finally, we need more young specialists. It would seem they understand all this, so the ball is in their court."

Probably much of what Vitaliy Denisovich says should be done. But wouldn't it then be true that the shop would be built and the machines would still be operated by lathe operators and milling machine operators ordered to go there? It is by no means a frivolous question, in view of the fact that the plant gates do not even have the customary "Help Wanted" sign....

"What would be the use of putting one up?" says labor and wage department head O. Rogozhina, shrugging her shoulders in response to my puzzlement. "No one would come here anyway."

The entrance to the Dmitrovskiy Excavator Plant does not have a sign inviting applications either, but for a different reason. It does not need machine tool operators, although five years ago one in every four machine tool operator positions was not filled. Then the collective was seemingly reborn.

It is said the best answers are the simplest. If there are not enough machine tool operators, the Dmitrov workers concluded, then the practical implication is simply that each minute of working time for those we have must be valued as if it were gold. And a program of action was born of this premise: the contribution of each plant leader and each service was also evaluated on the basis of the increased return on each working minute of the machine tool operators.

Yu. Sukhotin, the current Dmitrovskiy plant director, first became familiar with his new job in the machine shop, where he stopped at the first work area, where a boring and turning lathe operator was servicing two machines. After observing for a few minutes, Yuriy Aleksandrovich asked, "If we add another drill here, can you handle it?" And suggested he could.

OTiZ [labor and wage department] senior engineer V. Koroteyev, then a sector foreman, remembers this incident well. "At that time, I was confronted with a psychological riddle," he recalls. "When a person operated two machines, he was pestering the janitor to clear away the borings and fetch another drill bit as he had lost the old one. This although, when the set-up machines were turning, he had time both to smoke and to clown around with his neighbors. Then he began operating three, and what a change: everything around the machine was in order, and there was no need for the janitor, as he picked up the borings himself. A paradox!"

A paradox which was unraveled later, when the machine-tool operators were no longer in a fever about equipment breakdowns, when the designers and technologists had revised every part and operation for labor-expenditure efficiency, when the shop had been rearranged with the aim of multiple machine-tool operation and collective forms of labor, when a two-week stockpile of machinery sets had -- through desparate efforts -- been accumulated. Then, amazingly, it was as if the plant was flooded with metal and assembly components and there was no longer any need for overtime and "black" [unpaid] Saturdays.

But there is nothing surprising in this: the primary element of production, the person, had revealed his own "miraculous" reserve. And the essence of the paradox noticed by the foreman was also revealed: the first stimulus to good work is confidence that your readiness to work better will always find support and concrete assistance.

In the 10th Five-Year Plan, production volume at the plant grew by 41 percent, output was significantly updated, and one excavator received the Badge of Quality. But the number of machine-tool operators was reduced by 10 percent. Whence this explosion of productivity? Approximately half was provided by engineering-technical measures, and the other half is credited to the machine-tool operators themselves. An overwhelming majority of them mastered related occupations and broadened their zones of service, and defects essentially disappeared.

But one would naturally have been impossible without the other, increasing engineering initiative without the support of the workers and vice versa.

"There is no shortage of machine-tool operators," is Yu. Sukhotin's credo. It is an objective fact that there are fewer machine-tool operators, but that is how it must be given the current worker and equipment opportunities. The semiautomatic machine tool does not free time for another cigarette. Today's ratio of one machine to one person is an impermissible luxury, technological barbarism. Multiple machine-tool operation is not an end in itself, of course. But it sets a goal! Each new operator of several machine tools in the shop should be considered another step forward in the struggle against routine in the workplace.

True, modern production is not arithmetic, but algebra, the daily solving of increasingly complex equations. But are the Saratov workers forbidden this path?

All my attempts to turn the discussion towards expanding service zones were blocked in concert by Saratov plant leaders and specialists, citing the specifics of their production. The astonishment with which the workers heard at a plant committee meeting that it turns out that the enterprise fund for training in related occupations is not used, year after year, lifted the veil over that.

"M. Moiseyev, head of the labor and wages department of our all-union association, visited the plant apropos of multiple machine-tool operation. He admitted that we do not have the right conditions for it," says OTiZ chief O. Rogozhina. She considers this argument incontrovertible and stresses that this year the plant is entirely free of this "burden," of introducing multiple machine-tool servicing. The uneasiness of branch leaders would be completely understandable to us from that viewpoint. Where, for example, is one to get the funds for the program put forward by leaders of the Saratov plant if the collective they head has failed to provide upwards of a million rubles in planned profit over the past six years?

The Dmitrovskiy experience, however, shows where the sources are. And its value lies not only in that this capital is in the form of concrete, tested forms and methods of highly productive work, but also in that it is a very sharp weapon

against inertia and the dependency inclinations of some managers. How much more output could have been obtained by the national economy and how much in additional funds could the branch have obtained for its own development had the Dmitrovskiy experience been disseminated to all ministry enterprises?

"Every enterprise has its own conditions," M. Bushuyev objects firmly, "and we must deal with them when planning the introduction of multiple machine-tool servicing."

For a while, it seemed to me I was still in Saratov. The arguments are from the same arsenal. But behind them lay precisely the same position, the essentially total ignoring of a progressive movement. What differences in production conditions could explain, for example, the fact that the Riga Crane-Building Plant has one multiple machine-tool operator and the Tyumen' two, while the Novosibirsk plant in that same "Soyuzstroy Mash" VPO [probably all-union production association] has one in every three workers servicing several machine tools.

Another specific, the "planning" of leading work methods, explains the secret of these contrasts. The quotation marks are for a reason: it is blasphemous to call a plan assignments which are met without even going out of the offices in which they are worked out -- many enterprises and entire VPO's more than met them this past five-year plan, doubling and even tripling them. What is the sense of such "planning"? Is it in fact to serve as a kind of reins to pull down "enthusiasts"?

Today, only 12 of every 100 branch workers are multiple machine-tool operators. However, this indicator is provided primarily by a few leading enterprises. But what counts in the branch is not they, but those, like the Saratov plant, who have been overtaken by the boomerang of an irresponsible attitude towards progressive experience.

The ministry did not even achieve the control labor productivity growth figures in the 10th Five-Year Plan. However, even this defeat did not open its eyes to the reserves and levers of the social factor of production development. The practice of carefree planning of the actualization of these reserves has been preserved. It is hard to foresee precisely what it will lead to by the end of the current five-year plan, but the trend is already clear: the labor productivity plan for the first year has once again not been carried out and the rates of labor productivity growth have slowed even more. Nonetheless, all is quiet in the labor organization administrations, VPO's and enterprises of the branch: assignments for introducing multiple machine-tool servicing are being overfulfilled.

11052

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METALWORKING EQUIPMENT

VITEBSK MACHINE TOOL PLANT IMENI S. M. KIROV

Moscow SOTSIALISTICHESKAYA INDUSTRIYA in Russian 2 Apr 82 p 1

[Article by V. Maslennikov (Vitebsk): "The Slogan -- Precision"]

[Text] One of the assembly shops at the Vitebsk Machine Tool Plant imeni S. M. Kirov has the unusual and eloquent name "temperature-constant." This means air temperature fluctuations are impermissible here, as they might affect product quality, the product being very high-precision numerical preset control machine tools.

One such machine tool is rumbling softly in a corner. It doesn't leave the shop. It is, as they say, a permanent resident and is now machining parts for its own younger brothers. The machine itself easily twists a blank and changes the tool.

"This is a very reliable processing center," says B. Dison, the enterprise's chief designer, pointed to the machine. "It has been operating for many years now and has yet to let us down. True, it is already a thing of the past for us. We are now producing the second generation of drill-mill-finish machine tools with a multipurpose NPC [numerical preset control] system. And we have begun working on third-generation machines. So we here in the shop can now anticipate having representatives of all three generations of this family."

...Assembly is the culmination of the efforts of all the many thousands of people in the collective. Assembly shop chief V. Mastikov is convinced that the best-qualified specialists are working right here.

"Who works better than A. Sayenko's brigade in assembling very complex mechanisms like drive wheel adjustment assemblies?" he asks, and then answers, "No one, of course! This brigade includes such craftsmen as Dmitriy Bocheko, Fedor Antonkin and Aleksey Shumov."

"But you should go to the sector in which V. Skitovich's fitters brigade works. He is the shop chief, and the compliment applies equally to him. But in his opinion, it goes without saying that there is no one better than the deliverers [sdatchiki] in G. Frantsev's brigade!

The assembly shop chief is not alone: the chiefs of other shops would praise their own workers just as highly. It is for good reason that the plant is

considered one of the best in the Ministry of Machine Tool and Tool Building Industry system, taking prizes for many quarters in a row in competitions and winning the challenge red banner of the CPSU Central Committee, USSR Council of Ministers, AUCCTU and Komsomol Central Committee and having its name inscribed on the All-Union Board of Honor at the USSR Exhibit of National Economic Achievements for last year's results.

More than half the enterprise's output bears the honored pentangle. Vitebsk machine tools operate in over 30 countries. But still, the bulk are for the domestic market. If you study the geography of the address labels, you find almost 1,500 names. There is not a single bearing or automotive plant in the country now that does not use Vitebsk machine tools. One, the KamAZ, has at least 200 and the GPZ-23 [state bearing plant] in Vologod has nearly 400. And just today, we shipped the Minsk GPZ-11 a large lot of PSh-666's, a new unit, never produced before in this country, for working barrel-shaped rollers.

We need to talk in a little more detail, probably, about the machine tools addressed to the Rybinsk Eyeglass Optics Plant and the Izyumskiy Opticomechanics Plant. These are, so to speak, nonspecialty items mastered by the enterprise in record time. Many already are aware that we have not solved the eyeglasses problem in this country, especially with regard to large-diameter lenses. So Vitebsk machine tool builders received an assignment to manufacture special semiautomatic machine tools for polishing eyeglass optics to new All-Union State Standards. The assignment has been carried out. A hundred such machine tools are already in operation in Rybinsk, and Izyum has 66. This year more than a hundred more such units will be made. And so many of us have already become familiar or are becoming familiar with the output of the plant imeni Kirov literally with our own eyes.

"Our machine-tool building plant is one of the oldest enterprises in Vitebsk," says the plant director, T. Zakharenko. "We will mark our 70th anniversary in two years. The plant has gone from producing simple agricultural machinery to producing highly productive, precision equipment and NPC processing centers. The enterprise is operating stably. Probably only one indicator is constantly changing here, but that is, I think, not only permissible, but entirely necessary under present conditions. Whereas 54.6 percent of the items produced last year bore the state Badge of Quality, we plan to produce at least 60 percent of our output with the honored pentangle by the end of the five-year plan.

Competition for a worthy greeting to the 60th anniversary of the formation of the USSR is now developing widely at the enterprise. Some 1,300 leading workers have obligated themselves to meet the five-year assignment in three and a half years.

Vitebsk machine-tool builders have proven over and over again that they do not boast idly.

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METALWORKING EQUIPMENT

UDC 658.5:658.516[621+681.2]

PLANS FOR PARTS STANDARDIZATION IN MACHINE BUILDING OUTLINED

Moscow STANDARTY I KACHESTVO in Russian No 5, May 82 (signed to press 21 Apr 82) pp 7-9

[Article by V.K. Andrikanis, candidate of technical sciences, and P.V. Mudretsov, All-Union Scientific Research Institute of Standardization in Machinery Manufacture: "Planning the Level of Standardization of Parts in Machine and Instrument Building During the 11th Five-Year Plan"]

[Text] The present stage of scientific and technical progress is characterized by the rapid development of new branches of the national economy, the re-equipping of existing production facilities, considerable complication of the designs of machinery, equipment and instruments, the introduction of new materials, specialization and extensive interbranch cooperation. Simultaneously with this, the requirements for the quality, reliability and durability of parts are being raised sharply.

The expansion of specialization and joint production work, as well as the complication of interbranch relationships, causes the nature of the scientific and technical decisions made about production planning and execution to be quite complex; in connection with this many problems have appeared, among which the problem of standardization occupies a special place.

In the "Basic Directions for the Economic and Social Development of the USSR From 1981 to 1985 and During the Period Until 1990," which was adopted by the 26th CPSU Congress, it is written: "Increase the effectiveness of machine building production by improving its technology and organization and insure extensive intra- and interbranch standardization of parts, assemblies and production processes."

As an analysis has shown, the basic direction of parts standardization work in this branch comes down to the use in newly developed or modernized parts of previously planned, series-produced and approved or newly developed standardized component parts.

The planned indicator for the level of standardization in the state standardization plans in the 9th and 10th Five-Year Plans was the group of parts standardization factor K_g , which characterizes the average arithmetic value of the utility factors of the parts in the group, whereas in the annual plans it was the utility factor K_{ut} , which characterizes the degree of saturation of a given, specific article with standardized component parts.

The planning of the utility factor in the state standardization plans contributed to the further development of plant and (partially) branch standardization.

However, the planned indicator K_g of the level of standardization in the five-year plans did not always give an objective evaluation of the level of standardization within a type and between types of monotypical production and did not always characterize the true situation is a group of parts under discussion from the viewpoint of standardization.

In order to further improve planning with respect to standardization, USSR Gosplan decided to establish the interplan standardization factor as the planned indicator of the level of standardization during the 11th Five-Year Plan.

At the same time, Gosplan determined that the planning of the interplan standardization factor in five-year plans should, as a rule, be realized by subgroups or groups, whereas in the annual plans it should (again, as a rule) be done by types or subgroups of industrial output in accordance with the OKP [expansion unknown].

The use of interplan standardization factor K_{is} as the planned indicator of the level of standardization will make it possible to establish the level of mutual standardization of type sizes of component parts in monotypical articles, such as tractors in the same traction class, engines with the same power, potato-harvesting combines, vertical turning lathes, medium-class motor vehicles and so forth.

Interplan standardization makes it possible to insure the mutual replaceability of component parts in monotypical articles, which--in turn--makes it possible to use a standard process to manufacture them and insures the proper loading of the production equipment, which--again, in turn--insures production mobility and improves its efficiency.

In order to sum up the results of the work done in the area of standardization and unitization for the purpose of executing the assignments made for the Ninth Five-Year Plan, as well as for the further activization of work on standardization, by Gosstandart [probably State Committee for Standards] and the Central Board of NTO Mashprom [Scientific and Technical Society of the Machinery Industry] in conjunction with the machine building ministries, USSR Goskomsel'khoztekhnika [expansion unknown] and USSR VDNKh [Exhibition of Achievements of the National Economy], the Fourth All-Union Competition for the Best Work in Standardization and Unitization in Machine Building was organized*.

The purpose of the competition was to discover and popularize practical projects and scientific developments in the field of standardization and unitization that are of the greatest value in saving labor resources and improving parts quality, including the reduction of material-intensiveness and fuel and energy consumption during operation.

The Diploma of the First Degree was awarded to the Minsk Automobile Plant's project: "Using the Unitization Method, Based on Standardized Motor Vehicle Assemblies, to Build the Standardized Series of MAZ-5335 Motor Vehicles."

*See STANDARTY I KACHESTVO, No 3, 1982, pp 63-64.

The series of modifications of MAZ-5335 motor vehicles developed by the plant satisfies the most diversified requirements of the national economy, while the configuration of the chassis makes it suitable for the installation on it of various special machines: excavators, cranes, drilling rigs, cement carriers, refuelling trucks and so on.

As a result of the extensive use of the unitization method during the development of the designs of transportation machines on the basis of standardized motor vehicle assemblies, a new family of standardized motor vehicles, trailers and semitrailers has been created.

The basic technical and economic parameters of the new family of MAZ-5335 motor vehicles correspond to their present level and their indicators are at the level of foreign analogs.

The MAZ-5335 motor vehicle series consists of the following basic models:

Main line trucks and trailer trains with a large cargo capacity (of the 4 x 2 type). The motor vehicles of this class include trucks suitable for operation with truck trailers, as well as truck tractors that operate with truck semitrailers. For example, the MAZ-5335 platform truck, which has a cargo capacity of 17 t, together with the MAZ-8926 motor vehicle trailer forms a trailer train with a cargo capacity of 17 t. The cargo capacity of the general-purpose trailer train formed by the MAZ-5429 truck tractor and the MAZ-5245 and MAZ-93801 semitrailers is 15 t. These prime movers are also used to tow cement-carrying semitrailers, liquid gas tanks, refuelling trailers, and refrigerating and other units with a total weight of 18-22 t.

Dump trucks and trailer trains with a large cargo capacity (of the 4 x 2 type). The motor vehicles in this class include the MAZ-5549 dump truck, with rear dumping and a general-purpose platform with a cargo capacity of 8-9 t, as well as the dumping tractor trailer train with rear dumping that consists of the MAZ-5430 prime mover and the MAZ-5232V dumping semitrailer, which has a cargo capacity of 14 t.

Cross-country vehicles (of the 4 x 4 type). These motor vehicles include the MAZ-509A cross-country timber truck, which carries logs up to 30 m long that, together with the pole trailer, can weigh 21 t.

In addition to the models described above, the series of MAZ-5335 motor vehicles that has been developed includes vehicles suitable for operation under different climatic and operating conditions. The chassis of the MAZ-5335 family of motor vehicles are used by various enterprises throughout the country for the installation of 35 special bodies and rigs.

It should be mentioned that the series of main line motor vehicles that has been created features a high level of standardization.

For these six motor vehicle models, the interplan standardization factor was more than 50 percent.

For the successful development of state standardization plans for an increase in the level of parts standardization during the 11th Five-Year Plan, in 1979 Gosstandart and the leading and basic organizations for standardization developed and approved

a complex of normative and technical documents establishing a unified methodological approach to parts standardization questions. The complex includes four State Standards and three methodological instructions:

GOST [All-Union State Standard] 23945.0-80--"Parts Standardization: Basic Rules";
GOST 23945.1-80--"Parts Standardization: Basic Requirements for Developing (Selecting) the Basic Part";

GOST 23945.2-80--"Parts Standardization: Order of Assignment of Requirements for Standardization and Unification in Specifications";

GOST 23945.3-80--"Parts Standardization: Appraisal of Plans on a Given Level of Standardization";

RD [expansion unknown] 50-170-79--"Parts Standardization: Registers of Type Parts Designs; Basic Rules";

RD 50-176-80--"Parts Standardization: Order of Development of Limiting Lists";

RD 50-33-80--"Determination of Parts Standardization and Unification Level."

In order to establish a unified order for the conduct of standardization work and an industrial branch reporting order for reports on the fulfillment of planned assignments concerning the level of standardization, as well as to monitor the fulfillment of assignments concerning the parts standardization level, VNIINMASH [All-Union Scientific Research Institute of Standardization in Machinery Manufacture] developed the methodological instructions RD 50-173-80: "Order for Planning and Monitoring the Level of Parts Standardization," which establish the order of establishment of assignments for the standardization level at different working levels: state, branch and enterprise.

The order of the establishment of assignments for the level of parts standardization in machine building and other branches of industry is determined by USSR Gosplan and Gosstandart at the state level, whereas at the branch level it is done by the ministry in charge of the branch.

Assignments for the level of parts standardization in production associations (enterprises) and organizations are established in the specifications for the part or group of parts, in accordance with GOST 23945.2-80.

In order to insure standardization of parts, assemblies and instruments, quantitative and qualitative requirements for standardization according to GOST 23945.2-80 are included in standards of the type of specifications (general specifications), general technical requirements (technical requirements), types, basic parameters and/or dimensions (parameters and/or dimensions).

When establishing assignments for the level of standardization of industrial output at the state level, the following sequence for the conduct of the work is specified: establishment of the nomenclature of the industrial output included in the five-year plan;

determination, according to the classification groupings of the industrial output, of the control numbers of the level of standardization at the beginning and end of the planned period.

When calculating the control numbers at the beginning of the planned period, parts in production are taken into consideration, whereas when determining the control numbers at the end of the planned period, parts for which production will be realized at the end of the planned period are taken into consideration, including new and modernized parts.

In accordance with RD 50-173-80, the ministries responsible for the production of parts for which a raising of the level of standardization is being planned work out specific measures providing for the conduct of scientific research, planning and design, experimental and other types of work to be carried out for the purpose of increasing the level of parts standardization and also develop NTD's [expansion unknown] (GOST's, OST's [expansion unknown], STP's [Technical Aids and Information], registers of type designs of parts, limiting lists and so on).

Subsequently, these measures will be the basis for the formulation of the annual plans for raising the level of standardization of industrial output; it is necessary to say here that these measures have not yet been worked out by all the leading and basic standardization organizations.

For the purpose of realizing the execution of assignments for the level of parts standardization, in the methodological instructions it is specified that the leading ministries in the production of those parts for which standardization level assignments have been established are to present the necessary data on the fulfillment of planned assignments upon request from Gosstandart.

The methodological instructions also specify the reporting order, in the branches, for the fulfillment of parts standardization level assignments.

On the basis of data on the implementation of the measures that have been worked out, the basic standardization organizations compile annual reports, to which are attached explanatory notes containing data for the calculation of the level of standardization for planned classification grouping of industrial output, using the form stipulated by RD 50-33-80, as well as data on the actually achieved levels of parts standardization and a list of the completed work thanks to which they have been achieved.

It should be said here that the methodological instructions are aimed at the further improvement/planning of the level of parts standardization in machine building and other branches of industry for the purposes of:

raising the level of standardization of systems and complexes of machines;
the extensive use during development work of parts with standardized designs and series-produced assemblies and parts that have been tested in practice;
fuller utilization of basic parts, modular block designs and standard parts and assemblies from general machine building practice.

Having provided for the intensive development of standardization at the branch and--most importantly--the interbranch level, the establishment of the interplan standardization factor as the planned indicator will facilitate the acceleration of scientific and technical progress and an increase in the productivity of labor.

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PREPARING PARTS FOR MACHINING BY MACHINE TOOLS WITH NUMERICAL PROGRAM CONTROL

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[Article by A.I. Uss, Khar'kov Institute of Engineering Economics: "Technique for the Technological Preparation of Parts for Machining by Machine Tools With ChPU"]

[Text] The experience gained in the use of machine tools with numerical program control (ChPU) in both Soviet and foreign plants has demonstrated that the introduction of these machine tools requires significant outlays of time and facilities for the technological preparation for production, formulation of the control program and debugging. As a result, from the moment such a machine tool arrives at a plant until it is operating under a full load, several months can pass. During all this time the automated, highly productive, expensive equipment is either standing idle or not being used at its full capacity. Consequently, this affects the efficient utilization of the enterprise's fixed capital.

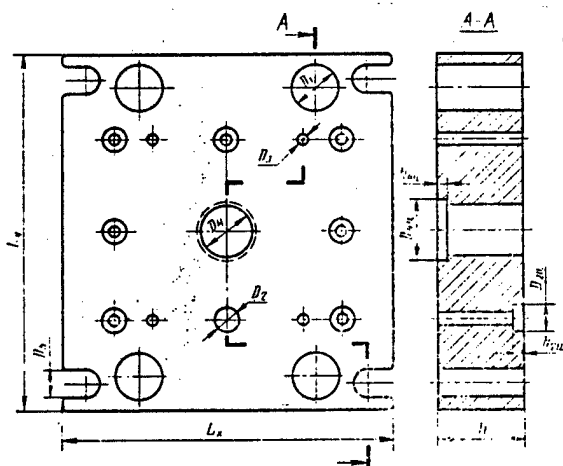


Figure 1. Representative part of the "die plate" type.

The introduction of standard technology and group machining shortens the period of technological preparation for production; however, this has its own specific features for machine tools with ChPU.

The traditional technique for standardizing technological processes is based on their classification, which in turn is based on the classification of the parts involved. With due consideration for the special features of the technological preparation for production for machine tools with ChPU, in the method proposed in this article the standard technology is based not on the part, but on an individual structural element--the so-called standard surface (opening, groove, shoulder

and others), the machining of which is carried out by a single cutting tool operating with a closed cycle. By investigating standard surfaces according to a certain system, it is possible to see structural similarity or diversity among parts and their structural elements in order to determine the methods and directions for reducing the number of type surface dimensions.

Table 1. Fragment of Classification Table of Type Surface (Opening) Dimensions for Die Plates

№№ шп. (1)	Номер чертежа штампа (2)	l_1	l_2	D_1	h	D_2	h	D_3	h	D_4	h	D_5	h	D_6	h	D_7	h	D_8	h	D_9	h	D_{10}	h	D_{11}	h	D_{12}	h	D_{13}	h	D_{14}	h	D_{15}	h	D_{16}	h	D_{17}	h	D_{18}	h	D_{19}	h	D_{20}	h	D_{21}	h	D_{22}	h	D_{23}	h	D_{24}	h	D_{25}	h	D_{26}	h	D_{27}	h	D_{28}	h	D_{29}	h	D_{30}	h	D_{31}	h	D_{32}	h	D_{33}	h	D_{34}	h	D_{35}	h	D_{36}	h	D_{37}	h	D_{38}	h	D_{39}	h	D_{40}	h	D_{41}	h	D_{42}	h	D_{43}	h	D_{44}	h	D_{45}	h	D_{46}	h	D_{47}	h	D_{48}	h	D_{49}	h	D_{50}	h	D_{51}	h	D_{52}	h	D_{53}	h	D_{54}	h	D_{55}	h	D_{56}	h	D_{57}	h	D_{58}	h	D_{59}	h	D_{60}	h	D_{61}	h	D_{62}	h	D_{63}	h	D_{64}	h	D_{65}	h	D_{66}	h	D_{67}	h	D_{68}	h	D_{69}	h	D_{70}	h	D_{71}	h	D_{72}	h	D_{73}	h	D_{74}	h	D_{75}	h	D_{76}	h	D_{77}	h	D_{78}	h	D_{79}	h	D_{80}	h	D_{81}	h	D_{82}	h	D_{83}	h	D_{84}	h	D_{85}	h	D_{86}	h	D_{87}	h	D_{88}	h	D_{89}	h	D_{90}	h	D_{91}	h	D_{92}	h	D_{93}	h	D_{94}	h	D_{95}	h	D_{96}	h	D_{97}	h	D_{98}	h	D_{99}	h	D_{100}	h	D_{101}	h	D_{102}	h	D_{103}	h	D_{104}	h	D_{105}	h	D_{106}	h	D_{107}	h	D_{108}	h	D_{109}	h	D_{110}	h	D_{111}	h	D_{112}	h	D_{113}	h	D_{114}	h	D_{115}	h	D_{116}	h	D_{117}	h	D_{118}	h	D_{119}	h	D_{120}	h	D_{121}	h	D_{122}	h	D_{123}	h	D_{124}	h	D_{125}	h	D_{126}	h	D_{127}	h	D_{128}	h	D_{129}	h	D_{130}	h	D_{131}	h	D_{132}	h	D_{133}	h	D_{134}	h	D_{135}	h	D_{136}	h	D_{137}	h	D_{138}	h	D_{139}	h	D_{140}	h	D_{141}	h	D_{142}	h	D_{143}	h	D_{144}	h	D_{145}	h	D_{146}	h	D_{147}	h	D_{148}	h	D_{149}	h	D_{150}	h	D_{151}	h	D_{152}	h	D_{153}	h	D_{154}	h	D_{155}	h	D_{156}	h	D_{157}	h	D_{158}	h	D_{159}	h	D_{160}	h	D_{161}	h	D_{162}	h	D_{163}	h	D_{164}	h	D_{165}	h	D_{166}	h	D_{167}	h	D_{168}	h	D_{169}	h	D_{170}	h	D_{171}	h	D_{172}	h	D_{173}	h	D_{174}	h	D_{175}	h	D_{176}	h	D_{177}	h	D_{178}	h	D_{179}	h	D_{180}	h	D_{181}	h	D_{182}	h	D_{183}	h	D_{184}	h	D_{185}	h	D_{186}	h	D_{187}	h	D_{188}	h	D_{189}	h	D_{190}	h	D_{191}	h	D_{192}	h	D_{193}	h	D_{194}	h	D_{195}	h	D_{196}	h	D_{197}	h	D_{198}	h	D_{199}	h	D_{200}	h	D_{201}	h	D_{202}	h	D_{203}	h	D_{204}	h	D_{205}	h	D_{206}	h	D_{207}	h	D_{208}	h	D_{209}	h	D_{210}	h	D_{211}	h	D_{212}	h	D_{213}	h	D_{214}	h	D_{215}	h	D_{216}	h	D_{217}	h	D_{218}	h	D_{219}	h	D_{220}	h	D_{221}	h	D_{222}	h	D_{223}	h	D_{224}	h	D_{225}	h	D_{226}	h	D_{227}	h	D_{228}	h	D_{229}	h	D_{230}	h	D_{231}	h	D_{232}	h	D_{233}	h	D_{234}	h	D_{235}	h	D_{236}	h	D_{237}	h	D_{238}	h	D_{239}	h	D_{240}	h	D_{241}	h	D_{242}	h	D_{243}	h	D_{244}	h	D_{245}	h	D_{246}	h	D_{247}	h	D_{248}	h	D_{249}	h	D_{250}	h	D_{251}	h	D_{252}	h	D_{253}	h	D_{254}	h	D_{255}	h	D_{256}	h	D_{257}	h	D_{258}	h	D_{259}	h	D_{260}	h	D_{261}	h	D_{262}	h	D_{263}	h	D_{264}	h	D_{265}	h	D_{266}	h	D_{267}	h	D_{268}	h	D_{269}	h	D_{270}	h	D_{271}	h	D_{272}	h	D_{273}	h	D_{274}	h	D_{275}	h	D_{276}	h	D_{277}	h	D_{278}	h	D_{279}	h	D_{280}	h	D_{281}	h	D_{282}	h	D_{283}	h	D_{284}	h	D_{285}	h	D_{286}	h	D_{287}	h	D_{288}	h	D_{289}	h	D_{290}	h	D_{291}	h	D_{292}	h	D_{293}	h	D_{294}	h	D_{295}	h	D_{296}	h	D_{297}	h	D_{298}	h	D_{299}	h	D_{300}	h	D_{301}	h	D_{302}	h	D_{303}	h	D_{304}	h	D_{305}	h	D_{306}	h	D_{307}	h	D_{308}	h	D_{309}	h	D_{310}	h	D_{311}	h	D_{312}	h	D_{313}	h	D_{314}	h	D_{315}	h	D_{316}	h	D_{317}	h	D_{318}	h	D_{319}	h	D_{320}	h	D_{321}	h	D_{322}	h	D_{323}	h	D_{324}	h	D_{325}	h	D_{326}	h	D_{327}	h	D_{328}	h	D_{329}	h	D_{330}	h	D_{331}	h	D_{332}	h	D_{333}	h	D_{334}	h	D_{335}	h	D_{336}	h	D_{337}	h	D_{338}	h	D_{339}	h	D_{340}	h	D_{341}	h	D_{342}	h	D_{343}	h	D_{344}	h	D_{345}	h	D_{346}	h	D_{347}	h	D_{348}	h	D_{349}	h	D_{350}	h	D_{351}	h	D_{352}	h	D_{353}	h	D_{354}	h	D_{355}	h	D_{356}	h	D_{357}	h	D_{358}	h	D_{359}	h	D_{360}	h	D_{361}	h	D_{362}	h	D_{363}	h	D_{364}	h	D_{365}	h	D_{366}	h	D_{367}	h	D_{368}	h	D_{369}	h	D_{370}	h	D_{371}	h	D_{372}	h	D_{373}	h	D_{374}	h	D_{375}	h	D_{376}	h	D_{377}	h	D_{378}	h	D_{379}	h	D_{380}	h	D_{381}	h	D_{382}	h	D_{383}	h	D_{384}	h	D_{385}	h	D_{386}	h	D_{387}	h	D_{388}	h	D_{389}	h	D_{390}	h	D_{391}	h	D_{392}	h	D_{393}	h	D_{394}	h	D_{395}	h	D_{396}	h	D_{397}	h	D_{398}	h	D_{399}	h	D_{400}	h	D_{401}	h	D_{402}	h	D_{403}	h	D_{404}	h	D_{405}	h	D_{406}	h	D_{407}	h	D_{408}	h	D_{409}	h	D_{410}	h	D_{411}	h	D_{412}	h	D_{413}	h	D_{414}	h	D_{415}	h	D_{416}	h	D_{417}	h	D_{418}	h	D_{419}	h	D_{420}	h	D_{421}	h	D_{422}	h	D_{423}	h	D_{424}	h	D_{425}	h	D_{426}	h	D_{427}	h	D_{428}	h	D_{429}	h	D_{430}	h	D_{431}	h	D_{432}	h	D_{433}	h	D_{434}	h	D_{435}	h	D_{436}	h	D_{437}	h	D_{438}	h	D_{439}	h	D_{440}	h	D_{441}	h	D_{442}	h	D_{443}	h	D_{444}	h	D_{445}	h	D_{446}	h	D_{447}	h	D_{448}	h	D_{449}	h	D_{450}	h	D_{451}	h	D_{452}	h	D_{453}	h	D_{454}	h	D_{455}	h	D_{456}	h	D_{457}	h	D_{458}	h	D_{459}	h	D_{460}	h	D_{461}	h	D_{462}	h	D_{463}	h	D_{464}	h	D_{465}	h	D_{466}	h	D_{467}	h	D_{468}	h	D_{469}	h	D_{470}	h	D_{471}	h	D_{472}	h	D_{473}	h	D_{474}	h	D_{475}	h	D_{476}	h	D_{477}	h	D_{478}	h	D_{479}	h	D_{480}	h	D_{481}	h	D_{482}	h	D_{483}	h	D_{484}	h	D_{485}	h	D_{486}	h	D_{487}	h	D_{488}	h	D_{489}	h	D_{490}	h	D_{491}	h	D_{492}	h	D_{493}	h	D_{494}	h	D_{495}	h	D_{496}	h	D_{497}	h	D_{498}	h	D_{499}	h	D_{500}	h	D_{501}	h	D_{502}	h	D_{503}	h	D_{504}	h	D_{505}	h	D_{506}	h	D_{507}	h	D_{508}	h	D_{509}	h	D_{510}	h	D_{511}	h	D_{512}	h	D_{513}	h	D_{514}	h	D_{515}	h	D_{516}	h	D_{517}	h	D_{518}	h	D_{519}	h	D_{520}	h	D_{521}	h	D_{522}	h	D_{523}	h	D_{524}	h	D_{525}	h	D_{526}	h	D_{527}	h	D_{528}	h	D_{529}	h	D_{530}	h	D_{531}	h	D_{532}	h	D_{533}	h	D_{534}	h	D_{535}	h	D_{536}	h	D_{537}	h
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When solving programming problems, this makes it possible to encompass an entire set of parts, treat each separate part as an element of a single system, and--consequently--design the technological processes on the basis of general regularities inherent in the given set of parts. In turn, this makes it possible to reduce the diversity of the cutting tool's products list and its type sizes, and then to assign permanent numbers to the cutting tools and use them in several control programs and group adjustments on machine tools with ChPU.

In order to solve the problems listed above, we now propose a technique for raising the level of producibility of parts machined on machine tools with ChPU. The sequence in which this is done according to this technique is as follows:
 a representative part is selected from a group of parts having the same functional purpose;
 a sketch is made of the representative part, on which the dimensions of the standard surfaces are designated by letters, as is shown in Figure 1;
 a classification table of the standard surfaces' dimensions is compiled, as shown in Table 1;
 a graph of the standard surfaces' dimensions is plotted (Figure 2a);
 the dimensions of the standard surfaces of the parts, as represented in Table 1, are studied for the purpose of finding similarities in order to reduce their variety;
 the data obtained on the existing and proposed dimensions are entered in a table (Table 2);
 a new graph of the standard surfaces' dimensions is plotted (Figure 2b).

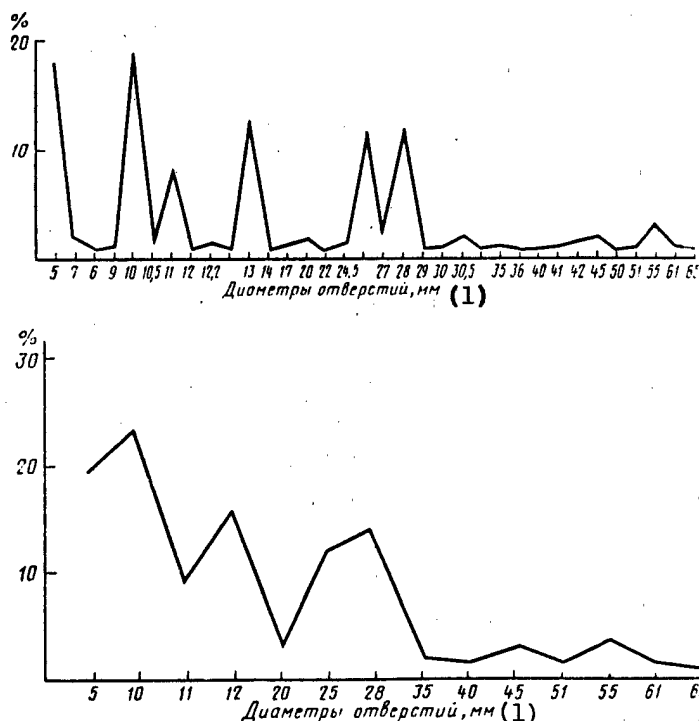
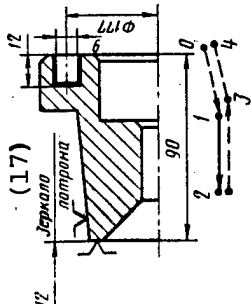


Figure 2. Graph of dimensions of standard surfaces before (a) and after (b) standardization.

Key: 1. Opening diameters, mm

From the graph in Figure 2a it is obvious that it is necessary to use 34 cutting tools (bits, counterbores, reamers and others) to machine the openings. As a result

Table 3. Integrated Engineering Calculation and Code Blank

Эскиз обрабатываемой поверхности (1)														
(2) № п.п.	(3) Содержание переходов	(4) Инструмент		(7) Режимы			(12) Охлаждающие пути, мм	(13) Время		x	y		Код (15)	Знак (16)
		(5) Блок	(6) Разец	(8) n, об./мин	(9) s, мм/мин	(10) f, мм/зуб		(11) T _к	(14) мм		(14) мм			
														
1	Понск блока (18)	67	Ир — У 1128 ст	0	0	0	0	0	0,2	271	0	150	0	0
2	Подход с «О» (19)			70	2000	1000	137	0,07	134	13700	84,5	13100	15	75
3	Точить канавку (20)			—	0,1	7,0	14	2,0		120	1400	—	0	12
4	Отход (21)			—	23	2000	30	0,01	150	3000	—	0	—	75
5	Отход в «О» (22)			—	уск.	2000	121	0,06	271	12148	150	13148	—	75
					23	1000	65,5	Σ 2,0	Σ 0,46					—
Модуль (24)	№ кадра (25)	Перемещение по x (26)		Перемещение по y (26)		Подача (27)	Обороты (28)	Смена инструмента (29)	Охлаждение (11)	Конеч (30)	Примечание (31)			
9	К 0 4 5	Е 0 0 0 0 0 0		Д 0 0 0 0 0 0		П 0 0		С 6 7		Н				
0	К 0 4 6	Е 6 1 3 7 0 0		Д 2 1 3 1 0 0		П 7 5	Ш 1			Н				
3	К 0 4 7	Е 6 0 1 4 0 0		Д 0 0 0 0 0 0		П 1 2				Н				
8	К 0 4 8	Е 5 0 3 0 0 0				П 7 5				Н				
5	К 0 4 9	Е 1 1 2 1 4 8		Д 5 1 3 1 4 8			Ш 0 0			Н				

Key:

1. Drawing of piece being machine
2. Serial number
3. Substance of transition
4. Tool
5. Block
6. Cutter
7. Operating conditions
8. n, r/min
9. s, mm/rev
10. s, mm/min
11. Cooling
12. Length of path, mm
13. Time
14. Pulse
15. Code
16. Sign
17. Chuck face
18. Search for block
19. Approach from "0"
20. Cut groove
21. Withdrawal
22. Withdrawal to "0"
23. Accelerating
24. Module
25. Frame number
26. Displacement with respect to .
27. Feed
28. Revolutions
29. Tool replacement
30. End
31. Notes

Table 4. Comparative Time Outlays for Technological Preparation for Production for Machine Tools With ChPU

Наименование работ (1)	Затраты времени, ч (2)	
	Сущест- вующая техно- логия (3)	Типовая техноло- гия (4)
Разработка схемы наладки и циклограмм (5)	6	2
Выбор режущего инструмента (6)	4	---
Определение вылета режущего инструмента по осям X и Y (7)	5	---
Выбор режимов резания (8)	5	---
Заполнение расчетно-технологической карты (9)	8	2
Заполнение кодовой карты (10)	2	1
Запись программы на перфокарту (11)	3	3
(12) Контроль и корректировка программы	2	1
Отладка программы на станке (13)	8	4

Key:

- | | |
|---|--|
| 1. Description of work | 8. Selection of cutting modes |
| 2. Time outlays, h | 9. Filling out of engineering calculation card |
| 3. Existing technology | 10. Filling out of code card |
| 4. Standard technology | 11. Program entry onto punched tape |
| 5. Development of debugging plan and cyclograms | 12. Program monitoring and correction |
| 6. Selection of cutting tool | 13. Debugging of program on machine tool |
| 7. Determination of cutting tool sweep along X and Y axes | |

of the reduction in the number of dimensions of standard surfaces, only 14 tools are needed (see Figure 2b).

A reduction in the number of standard surface dimensions and cutting tool products list makes it possible to shorten the time required for programming considerably, since standard cutting tools are mounted accurately in certain positions and the programmer regards them as an invariable machine tool fitting with permanent sweeps and cutting modes. During the programming of the machining of a new part, his attention need be concentrated only on which of the 14 tools at his disposal should be used in the machining and which should be eliminated.

Constancy of the cutting tool and standard surface dimensions creates the conditions for the development of a standard technology for an individual elementary surface and the recording in it of a control program.

As an example, Table 3 depicts the technological and programming information for the cutting of a circular groove, as recorded on a specially developed integrated engineering calculation and code blank. It contains the information on the optimum variant for a set of cutting tools, the optimum cutting modes, the trajectory of the tool's working and auxiliary movements and so on.

A set of 14 types of cutting tools in the magazine of a Model 243F4 OTs [expansion unknown] machine tool will make it possible not only to machine all the surfaces of a rather complex part, but is also sufficient for the machining of a whole series of parts without replacement of the set when changing from one part to another. In this case the machine tool's settings will be changed only when the punched tape and the attachments are replaced. This is very important for economical utilization of machine tools with ChPU in small-series production, where time lost in adjusting a machine tool are particularly tangible.

Thus, the reduction in the variety of standard surface dimensions and the determination of their similarities, the reduction in the cutting tool products list and the development of an integrated engineering calculation and code blank for the recording of programming information about a standard surface made it possible--because of the complete or partial utilization of standard control programs--to simplify the work of the manufacturing engineers, programmers and adjusters, as well as improve considerably the quality of the work being done.

In order to determine the effectiveness of the new technique, technological preparation for production was carried out according to the existing technology, with the time outlays being determined by time studies. The same work was then done according to standard technology, using standard programs; that is, prepared pieces of programs and group adjustments. As it turned out, the time spent on technological preparation for production by the latter method was considerably shorter (Table 4).

This creates real possibilities for operating machine tools with ChPU at full capacity in a shorter period of time and to use them more efficiently in the production process.

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METALWORKING EQUIPMENT

BRIEFS

NEW AUTOMATIC LATHE--Kramatorsk (Donetskaya Oblast). The Kramatorsk Plant imeni Chubar' has shipped Ul'yanovsk machinebuilders a unique heavy-duty automatic lathe. The unit can machine 8-m parts weighing up to 40 tons without the constant presence of a worker. All operations -- turning, thread cutting, drilling, grinding and others -- are done automatically. The machine readjusts itself and changes tools when changing operations without human assistance. This five-year plan, the country's machinebuilders will receive more than 30 such machines. [Text] [Moscow KRASNAYA ZVEZDA in Russian 31 Mar 82 p 1] 11052

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END