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USSR Industrial Development

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This serial publication contains translations of selected articles on the chemical industry in the Soviet Union, on the specific subjects indicated in the table of contents below. Complete bibliographic information accompanies each article.

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TECHNICAL AND PERSONNEL PROBLEMS IN INDUSTRY

[Following is a translation of an article by I. Berezovskiy in the Russian-language publication Partiynaya Zhizn' (Party Life), Moscow, No 3, Feb 62, pp 27--33.]

When one casts a thoughtful look over the history of the development of the combine, his pride in our Party and our Soviet man -- the creator -- rises. It is the middle of 1948. Surveyors came to the southern steppes of Bashkiriya. After them came the first builders. In accordance with the plan by "Lengiprogaz" and the Leningrad Gosstroyproyekt, a new industrial center was being put up here. But serious miscalculations found their way into the well-conceived plan. Capital investments into the construction of a plant for the hydrogenation of sulfur-rich mazut turned out to be excessively large and the operating costs high. In accordance with the plan, the cost of a ton of gasoline was several times greater than at petroleum refineries. According to approximate calculations, the annual losses would amount to about 100 million rubles (here and below -- using the new scale of prices). And still they started the construction.

The construction base was prepared in a short period of time. By the end of 1951 the machine building plant started operations and a year and a half later saw the startup of the heat and electric power station. The adjacent areas received light and power. Stone houses, schools, children's playgrounds, nurseries, trade schools, schools of industrial training, and a technical school made their appearance. The housing settlement was given the name of Salavat -- remarkable son of the Bashkir people, legendary fellow champion of Yemel'yan Pugachev. The first young engineers, technologists, mechanics, and economists arrived -- those who were forever to bind their fate with the life of the future enterprise.

People began to think how to make the enterprise profitable and to correct the errors and miscalculations permitted by the plan. And wherever one searches, there he will find possibilities.

In 1954 the Ministry of the Petroleum Industry prepared proposals for the construction of a new petroleum refinery in the area of Ishimbay. The planning organizations determined its estimated cost at tens of millions of rubles, Ishimbay is several kilometers from Salavat. But the construction here was to be conducted by another main committee of the ministry. It, naturally, proposed to start with the development of its construction base, its own heat and electric power station, the establishment of its own economy, etc. Formally this is all legal: there is a decision, the plant is called Novyy Ishimbayev, the estimate has been approved, and the capacity has been established. When the commission which was to select the site travelled in the area, it stopped at the village of Allaguvat in a neutral zone, five kilometers from our combine.

Here is where the engineers -- party and Komsomol members -- spoke out: why not make use of the establishment which is already in existence at the Salavat construction project, locate the new plant along side, and, by connecting the petroleum refining with the processes of hydrogenation, turn the technological system upside down? There is free electric power: steam, water, sewage disposal. There is no need to build anew barracks and auxiliary construction enterprises. It will not be necessary to establish a special directorship. The suggestion was supported in the oblast and city Party committees and competing main administrations gave up. A year and a half later, the first shops of the new plant which was built within the shortest periods of time were being placed in operation. Today, this shop is the basis for the processing of the sulfur-rich petroleums of Bashkiriya. The capacity of the enterprise is almost two and a half times greater than was planned and the expenditures of funds and materials turned out to be half as much.

And here is another example of initiative. The combine built a catalyst shop. Its purpose is to prepare alumina silicate catalysts for the catalytic cracking at the combine. The raw material consists of silicate lumps shipped in from Dagestan and Kaluga. A ton of these lumps cost 80 rubles; shipment cost seven rubles. All this was charged

to the cost of the gasolines. And in the meantime, it turned out that it was possible to produce it locally: soda is alongside and there are gas and sands. Within a short period of time, the initiators-enthusiasts are building a unit for the production of silicate lumps, which was not projected by the plan.

"You should also make shoe polish for your workers," were the laughing remarks at that time on the part of the specialists from the Ministry of the Petroleum Industry. But life laughed at them. Our lumps do not cost 87 rubles, but 32 rubles per ton. The organizational expenditures were amortized in two years. The so-called specialized plants produce four to five times more lumps but their operating personnel exceed ours almost ten times.

One small unit, but it is this that opened the way for an intensification of operations and made it possible to obtain new products. Silica gels being produced at the Voskresensk Chemical Combine did not satisfy even the limited demands of the national economy, while their cost is 900 to 2,400 rubles per ton. Our technologists have carefully studied the technology employed by the Voskresensk chemists. Then they installed additional apparatuses, intensified the cooking to a mesh, replaced the small-capacity pumps, and made use of the empty buildings of the second stage of the factory. And within a short period of time, the combine assured its own supply of catalysts and became the basic supplier of silica gels. The new production amounts to thousands of tons and its cost has been reduced to 300 to 400 rubles. Sometimes situations are strange. Previously the country was producing 500 to 700 tons of silica gel a year. The consumers experienced a great need for it. The development of industry was retarded. The supplier plant was honored: rare product! Pushers, telegrams... Pleas. Regular premiums... Now the output of basic brands of silica gel is eight times greater and the demands are being satisfied. A feeling of accomplished civic duty and conscience of the fact that the results of one's labor are pouring like a stream into our life gives one a deep moral satisfaction and an irreplaceable reward.

But here it is discovered that the existing order of planning with respect to the end results of the work during the preceding year, the systems of indices of Socialist competition and the payments of premiums are such that the more an enterprise makes today, the worse will be the status of the personnel tomorrow. It is particularly bad

for enterprises when the new production leaves at once in large amounts. The planning and corresponding marketing organizations frequently do not know the actual future demand and are not studying the fields of application.

After the first demand for silica gels was satisfied, difficulties were encountered in its marketing. The Glavkhimsnabsbyt frequently answered: "There are no addressees." They overstocked, and stopped fulfilling the plan -- the effects were not joyous. They themselves had to turn to the sovnarkhozes and enterprises, propagandize, recommend, and search for new fields of application, send pushers, and introduce. But there is punishment for sending pushers, without frequently even delving into the essence of the matter.

Finally, the demand increased several times. But how much time had to be recorded for the laggers and for those who were culpable!

The organization of the production of synthetic ammonia and nitrogen fertilizers in Bashkiriya was proposed only in the distant future. It was scheduled beyond the limits of the seven-year plan. But the Central Committee of the Party turned to the Soviet people to help agriculture increase to a maximum the yield from the fields and all enterprises started to search for reserves. The Salavat workers did not stand aside.

The Party committee of the combine and the Party organization of interested enterprises began to channel the creative thought of specialists and of the entire personnel in order to overturn the existing opinion about the impossibility of obtaining ammonia and carbamide (urea) within the limits of the seven-year plan. The engineers and workers tried carefully to study their unit, estimate the capacities of the apparatuses, machines, and pipe lines, and to compile material balances. They came to an understanding: not to try to equalize the bottlenecks, but, on the opposite, the widest areas, on the basis of the maximum possibilities, attempt to replace the low-output apparatuses and machines, take on a heavier burden, and to try.

The work was headed by the shop engineers L. M. Alekseyev, G. G. Kabat, L. I. Rozentsvet, M. F. Kirilov, A. S. Leont'yev, I. A. Krasyuk, V. F. Fialkovskiy, M. I. Smirnova, and others. The secretaries and many members of the shop

bureaus of the Party organizations took an active part. The resulting calculations were of interest. In the equalization of the bottlenecks, it was a matter of tens of thousands of tons of ammonia per year, with the minimum expenditures. And for the wide areas, it was about half a million, with expenditures considerably less than in the construction of new enterprises and the periods required were half as long.

There were heated disputes. Many proposed to stop at the minimum variant: this, they say, is more certain and placid. But victory was on the side of those who were more bold. The Salavat city committee and the Bashkirskaya Oblast Party committee enthusiastically supported the initiative. Upon instructions of the government, the planning organizations joined the case. The combine received great help from the State Institute of the Nitrogen Industry and its Kemerovo and Chirchik affiliates. They developed the technical documents in accordance with the maximum variant during short periods of time.

In one of the shops, the desired capacity was not obtained. The plants came with help. The Izhor workers for the first time and in a short period of time produced wholly forged, high-pressure apparatuses of large diameter. Four such units give more production than seven of earlier design. The "Uralgidromash" made the original machines, small in size, but with a capacity twice as great as those used previously.

Both organizations and people showed different attitudes toward the orders from the combine. Let us mention, first of all, the planners. It requires so much labor to come to an understanding with them! And the whole fact of the matter is that it is far more difficult to compile a plan of effective large reconstruction of an existing enterprise than to develop the technical documents for a new plant. Besides, in planning a new enterprise, the planning institute can utilize previously started drawings and the fulfillment of the plan moneywise is considerably greater than in developing the plan of reconstruction.

And so we come to an agreement with the general planner -- "Lengiprogaz." It objects against the entire idea, agreeing only as an exception to plan the construction of a new plant. Only after repeated pleas and agitational efforts on our side did the members of the "Lengiprogaz" take up the matter and in truth during a short period of

time they accomplished much painstaking work of planning and embodied our thoughts in drawings.

And take the builders. Friendly joint work of the operators, builders, installers, and planners is extremely important. But it is difficult and disadvantageous for the builders and installers to work under the conditions existing at the enterprises. We had to turn to the leaders of No 1 Construction Administration, Comrade Gaynullin, and the secretary of the Party organization, Comrade Masonov, with fervent pleas and it was necessary during the difficult times to discuss jointly with the Party members and all the workers-builders what to do and how to do it and with greater usefulness for the state. And much was accomplished with the warm enthusiasm, even to the detriment of the "indices" of the fulfillment of the plans of the building organization. After all, the system of recording the output in construction and installation is such that the more critical and high-cost materials are consumed the better the indices are on paper. Sometimes the builders are reproached: "Low output!" But a verification will show that the consumption of building materials and metal was simply less and that there were no "legalized" misappropriations.

Skilled and specialized organizations of the Ministry of Construction RSFSR are working in Salavat. According to calculations, the installation required a work stoppage of two months. But they completed the installation in two weeks without a break in the process. Of course, the leaders of the builders, V. S. Malygin and V. V. Sen'ko, the secretary of the Party organization, I. M. Lashchevskiy, had to work a great deal together with the brigade leaders and the workers.

The results of the search by the personnel is as follows: new capacities are being created for the production of synthetic ammonia and carbamide. Three years have passed since the submission of the suggestions. The first ammonia was produced in one and a half years and the first synthetic carbamide in two years.

The Party and the Government are paying great attention to our enterprises. Funds, equipment, and materials are being allocated. But what has been planned and built? What is the present result? By the end of the seven-year plan the basic funds will double in comparison with the first plan and commodity production will increase 20 times.

The number of workers will, however, increase only one and a half times. They started with 10 simple products. And now we have production of about 50 most valuable, diverse products; by the end of the seven-year plan, there will be about 80. Almost all of these were not originally envisaged by any plans. Much has to be taken in battle and by storming, using as a base the initiative of the engineering-technical workers and the support of the Party organization. The green light for chemistry was given by the May 1958 Plenum of the Party Central Committee. With each day petrochemistry is winning a greater place in the system of the national economy.

It is known that the success of any matter is decided by people. The Party organization made a deep study of the cadres and made a daily selection, training, and advancement of people. Leading positions are given only to those who have finished the schedule of subordinate work.

Our country has all the conditions for the training of specialists. The broad network of higher and secondary technical schools. The numerous networks of courses and schools for the working youth. Excellent laboratories and many talented teachers. And the large amount of scientific and technical literature, newspapers, and journals! Select for yourself the specialty of vocation, study, work, and broaden the horizons of your own vision, and create.

Unfortunately, for a certain section of those who finish the higher educational institutions and technical schools a trip to the plant is a waste of time and of state funds, a useless diversion of efforts and attention of the personnel from the matter at hand. This is known by many but they are shamefully keeping quiet.

The distribution of young specialists without the knowledge of the plant and without selection leads to serious outlays. Sometimes this is forced on us. Where, so to say, is he to be placed! After the arrival at the enterprise, someone at once starts to prepare for a flight to warmer climes. There is always a reason; you cannot stop such. We frequently had unpleasant situations -- reproaches from the cadres division of the sovnarkhoz for "distributing" the young specialists. And still those who wanted to leave were not constrained, but we did not take them back.

We look upon a worker not only from the viewpoint of what he represents today, but also from the viewpoint of

what can be obtained in the future, if experienced mentors are assigned over him. The leaders of any unit, shop, and manufacture are assigned only after a discussion of the candidacies in the Party organization, after we learn the personnel's opinion about the man.

And how do we proceed with violators of discipline? Without a decision of the comrades court or a general meeting of the shop, no one is discharged. For this reason, there are no cases of the leaders being called to court and of being compelled to rescind discharge orders. If, however, the leadership feels that a worker must be discharged, but the comrades on the job feel that we should wait and be patient with the man, then the deciding word is that of the personnel. The essence is not to insist on one's own and defend the "authority" of the administration. It is good when one can save a man, correct him. But when a postponement is in vain this serves as a lesson for the entire personnel. The important thing is that not a single violation is to be ignored without a discussion of some kind or other.

Of inestimable value is the organization in Salavat of an evening faculty of the Moscow Institute of the Petrochemical and Gas Industry imeni Gubkin. This is a whole event which has left an imprint on the entire life of the combine and the city. The technical progress and the rise in general know-how at the enterprise owe much to this. The evening faculty offers instruction to abat a thousand people, most of them workers from the combine. Four hundred workers are combining labor with study in the evening technical school. The training of engineers without a break from production is expanding with every year.

The basis of educating the personnel is confidence in people. To raise everyone higher and higher and to inspire with confidence. To take note of capabilities, believe in the person, and help him grow. Daily contact of the leaders with the personnel creates a deep mutual understanding and a feeling of mutual responsibility for the success of the business.

Ideological and moral factors are acquiring greater significance. This was well, truthfully, and heartily stated by N. G. Zaglada in her letter. Special attention is being paid at the combine to the selection of propagandists and agitators. This honor is reserved for the foremost and well trained engineers, technicians, and workers.

Among these are the leaders of shops, units, sections, and shifts. This makes it possible in practice to assure unity of organizational and ideological work.

The development of the chemical industry depends on the status of metallurgy and machine building. But technical progress in metallurgy itself, in all types of machine building and progress and transport, in instrument building, communication, electrical industry and in the production of products of wide consumption is wholly determined by the progress of petrochemistry. In order to create a Communist abundance, it is necessary to have not only large, but also reserve capacities for rubber, polyethylene, polypropylene, phenol, detergents, soda, fertilizers, insectofungicides, dyes, lacquers, solvents, plastics, vitamins and at least the basic types of synthetic fiber. Without plastics, linoleum, pretty and strong lacquers, thick and reinforced window glass, the further expansion of the construction of housing and the production of pretty furniture are impossible.

Within the next few years the national economy will require a large amount of polyethylene alone. Is it possible within a short period of time to create the necessary capacities? All this depends on what plants are to be planned and built. Those who built and placed on stream chemical enterprises agree that, in order to create plants of great capacities with large units, practically the same length of time is required as for a plant of small capacity with low-output apparatuses and machines. By doubling the capacity of a unit, the capital expenditures for additional production drop almost by 50 percent. The new technology is persistently knocking at the door; it is the child of the great revolution in all branches of human knowledge.

The solution of great, complex problems facing us requires complex work on the part of the research institutes, planning organizations, builders, installers, machine builders, and operating personnel. For this purpose, the leaders of the enterprises should take the time to create and master the new technology and the rational organization of production and not to sway from side to side and to worry less about how "to link, coordinate, settle."

We still have too many coordinating levels. They frequently detract people from an immediate, concrete matter. The leader of an enterprise must answer all telephone calls and letters. Rarely is one interested in the work scope of

the director, but try not to telephone, not to inform! For decades two railroads -- Ufimskaya and Kuybyshevskaya -- were operating side by side. How much paper they have consumed! Conferences and gatherings, but the production was not being shipped out. But finally only the Kuybyshevskaya railroad remained. This is to the good of everyone. The work is proceeding much better! The misunderstandings have been removed as if by hand.

It is difficult to give a correct technical idea. And how much rough work it is necessary to accomplish in order to develop the thought in all details, introduce it, and carry the matter to the desired end! How many unpleasant situations await one on the path of mastery! And in the meantime, the neighboring plant which for years did not trouble itself with searches and which kept strictly within the given indices kept on getting all the time easier tasks. It is never in debt. For any holiday it demonstrates three to five planned "achievements" known to everyone. It is used as an example for years.

The plans of production and the systems of encouragement should compel the leaders of the enterprises and the personnel to think, labor, and search. It is necessary to create an atmosphere of interest in obtaining a maximum possible volume of work and fulfilling it with the smallest expenditures of labor. To design and produce technically the most perfect machines, apparatuses, and instruments, and consumer goods, and to see how to produce additionally an extra score of shapes and products.

The November Plenum of the Central Committee of the Party decided very properly to concentrate the leadership of technical policy in the state committees of the Council of Ministers USSR for the branches of industry. In connection with this, we wish to express the desire that the individual planning organizations and research institutes be transferred to the jurisdiction of the leading enterprises, that the practice of creating large design divisions at large plants be expanded, and that the workers of the research laboratories and experimental shops have their wages equalized with those of the coworkers of scientific research institutes and the leaders of production shops. Conditions should be created under which the most trained engineers of the shops and capable of creative research could freely, without losing any of their wages, change over to research work or to a design division. So much has been written and said about this, but nothing has been done.

Recently the central newspapers have been featuring a discussion on problems of planning and raising the interest of enterprises in perfecting the production. A change in the system of work indices of enterprises is an urgent problem. In the chemical and petroleum refining industry the use of the term "gross" as a main index interferes with the combined, more full utilization of intermediates and wastes. It comes about that the less perfect and complete the processing and the greater the output of intermediates, the greater advantage for the personnel. Enterprises with production on a large scale, with a deep utilization of the raw materials, and with a wide assortment of end products remain, so far, in the worst conditions.

We think that we should not allow universal indices, handed down from above for all branches of industry, without consideration of the concrete conditions. Many misfortunes are the result of attempts to utilize a single standard key for the solution of all problems. There is still one more index for which we are fighting -- this is confidence in the initiative and creativity of the personnel of enterprises and their leaders.

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# WAYS TO INCREASE LABOR PRODUCTIVITY IN THE CHEMICAL INDUSTRY

[Following is a translation of an article by N. Fedorenko, S. Pogostin, and Yu. Fialkov in the Russian-language publication Voprosy Ekonomiki (Problems of Economics), Moscow, No. 1, Jan 63, pp 10--16.]

In order to solve the main economic task of the Party and the Soviet people -- the creation in the course of two decades of the material-technical base of Communism -- the study of the ways and rates of raising labor productivity in individual branches of industry, including one of the most rapidly growing -- the chemical industry -- is assuming great significance. The decisions of the 22nd Party Congress assign to this branch of industry an important role in the building of the material-technical base of Communism in our country. In the report at the November (1962) Plenum of the Central Committee of the Party, Comrade N. S. Khrushchev said, "We have taken the right direction for the development of the chemical industry and increasing the production of plastics, synthetic fibers and resins, mineral fertilizers, herbicides, and other chemical agents to combat pests and diseases of agricultural plants." In the course of 20 years the production by this branch of industry will increase approximately 17 times.

The progress of the national economy, technical progress, and, consequently, the growth of productivity of public labor depend to a great extent on the rates and level of development of the chemical industry.

Soviet chemical industry has a number of serious achievements. With respect to volume of production, it occupies first place in Europe and second place in the world. However, as a result of the increasing economic

role of the chemization of the national economy, the requirement of many branches for the production by the chemical industry is being still insufficiently satisfied. For this reason, the problem of raising the labor productivity in this given branch of industry is assuming great significance.

The increase in the output of chemical production by 1980, projected by the 22nd Party Congress through the introduction of new types of raw materials, advanced technology, overall automation and mechanization of production, presupposes the need of high rates of growth of labor productivity in the chemical industry. Among the ways for raising labor productivity in this branch of the national economy, the most important ones are the perfection of the raw-material base, automation of production processes, mechanization of labor-consuming operations and elimination of manual labor, and perfection of the organization of the repair establishment. In this paper we shall dwell on their analysis.

The greatest increase in labor productivity will be achieved as a result of the utilization of the petroleum and gas raw materials, on the basis of which the new branch of the chemical industry -- petrochemical -- is rapidly developing. It is becoming the main supplier of intermediates for the production of nitrogen fertilizers and synthetic materials. The utilization of petroleum and gas raw materials will make it possible to accomplish continuous technological processes at high speeds that will permit achievement of high output by the equipment.

The resources and scale of production of petroleum and concurrent petroleum and natural gases in the USSR are sufficient to supply the necessary production capacities of the industrial enterprises. The fraction of petroleum and gas raw materials in the production of plastics will increase from 15 percent in 1958 to 75 percent in 1965, that of chemical fibers, respectively, from seven to 25 to 28 percent, that of synthetic rubber from 0.6 to 55 percent. The total consumption of petroleum and gas raw materials in the chemical industry will increase during this period 5.6 times. The labor consumption required for the output of chemical production from such raw materials is much less than from other types of raw materials. For example, according to the calculations of the State Institute of the Nitrogen Industry, the labor consumption required for the production of one ton of ammonia at the Novo-Moskovsk

Nitrogen Fertilizer Combine employing gasification of coke (prior to the changeover of the enterprise to natural gas) amounted to 22.4 man-hours in 1958 and with catalytic conversion of methane (natural gas) it is equal to 6.5 to 10.5 man-hours (calculated on the basis of the respective capacities). Also, there is a considerable improvement in the working conditions.

The maximum utilization of hydrocarbons of petroleum origin and of natural gas constitutes an important reserve of the growth of labor productivity in the chemical industry. Preliminary calculations show that, as a result of the use of petroleum and gas raw materials alone, at the modern level of development of technology, labor productivity at enterprises for the production of synthetic ammonia, plastics, synthetic resins, synthetic rubber, and chemical fibers will increase two to three times.

The growth in consumption of petroleum and gas raw materials in the chemical industry will result in a large economy of public labor in different branches of the national economy. Labor expenditures for the production of chemical fibers are much less than for natural ones: labor expenditures for the production of one ton of cotton fiber, calculated for all stages of production, amount to 1,660 man-hours, that for wool (washed) -- 7,000, and that for natural silk -- 35,000 man-hours, whereas the production of one ton of viscose silk requires 800 man-hours, lavsan fiber -- 340, and viscose staple fiber -- 150 man-hours. The production of one ton of ethyl alcohol from food-grade raw materials, with consideration of labor expenditures for growing the grain and potatoes, as well as power expenditures requires 1,300 man-hours, while from petrochemical raw materials, including labor expenditures for producing and processing the petroleum and the power -- 78.4 man-hours, i.e., almost 17 times less. As a result of the production in 1965 of 700,000 tons of synthetic ethyl alcohol, the national economy will save approximately 860 million man-hours.

In the United States the production of most products of organic synthesis is almost completely based on hydrocarbons of petroleum and gas origin. Thus, according to data for 1960, the output of ethylene, propylene, butylene, polyethylene, polypropylene, isopropyl alcohol, and acrylonitrile was based entirely on petroleum and gas raw materials, while that of acetic acid, acetic anhydride, and methanol -- 98 percent, ammonia and formaldehyde -- 96 percent,

synthetic rubber -- 80 percent, etc. In 1960 the production of petrochemical products in the United States amounted to 25.5 million tons or 30 percent by weight of the total chemical production. During 1941--1960 it increased 25 times.

The development of the petrochemical industry was one of the important factors which determined the high level of labor productivity in the chemical industry in the United States. The greatest disparity in the levels of labor productivity in the chemical industry of the USSR and the United States resulted precisely in those branches which in the United States are based essentially on the utilization of petroleum-gas raw materials -- in the production of plastics, chemical fibers, and synthetic rubber. This is indicated also by the labor consumption required for the production of the indicated types of products. The labor consumption required for the production of one ton of plastics and synthetic resins is approximately 6.4 times greater in the USSR than in the United States, chemical fibers -- five times, and synthetic rubber -- seven times.

Another important direction in raising the labor productivity in the chemical industry is the automation of the production processes. With the development of direct inorganic and organic synthesis from petroleum and gas raw materials, overall automation of the production processes becomes not only economically advantageous, but in many cases unavoidable.

At the present time the chemical industry is conducting work on the overall automation of the basic shops of the plants that produce synthetic rubber and alcohol as well as at the nitrogen, soda, sulfuric acid, and tire enterprises. It is planned to automate during the seven-year plan over 150 shops and manufactures of different branches of the chemical industry. The production of synthetic rubber and alcohol is being automated completely; the production of plastics should be 95 percent automated by the end of the seven-year plan and that of chemical fibers -- 90 percent.

In order to introduce overall automation on a wide basis, it is necessary to have clear coordination in the work of scientific research organizations, the development of automation in accordance with a single plan, the substantiated selection of the most important standard variants of chemical manufactures which should be automated in the first place, and the concentration in this direction of

the basic forces in the corresponding fields of science in order to further generalize and widely introduce into practice the results. At the present, plans are under development for the standard overall automation of four nitrogen fertilizer plants, a tire plant, plants which produce contact sulfuric acid, benzidine, double superphosphate, polyethylene, etc.

In order to accomplish thorough preparation and mass introduction of overall automation and mechanization of the production processes, the chemical industry is establishing four experimental exemplary enterprises with a model level of automation and mechanization: the Novo-Moskovsk and Lisichansk Combines, the Voronezh Synthetic Rubber Plant, and the Barnaul Synthetic Fiber Plant. These enterprises should introduce the latest technology and overall mechanization and automation of production, including the transport, loading-unloading, and warehouse operations, as well as operations for packaging the finished production, which would assure a growth in labor productivity of 1.5 to 2 times even by 1965.

Overall automation and mechanization of the chemical production will make it possible to obtain a greater economy in material expenditures. As a result of the overall automation of the shop for acetic acid regeneration at the Vladimir Chemical Plant, the output of production increased 3.5 times and there was a considerable drop in the consumption norms of ethylacetate (by 40 percent), electric power (by 37 percent), steam (by 35 percent), and water (by 56 percent). Labor productivity of the shop workers increased more than four times, while the cost of production dropped by 27 percent. At the Groznyy Chemical Plant, thanks to automation of the production of phenol and acetone, the output of production increased 1.5 times, the consumption of benzene per ton of production dropped by 20 percent, etc.

In the automation of chemical manufacture, more frequent use is being made of centralized and local systems of automatic control and control by means of calculating information and control machines. These machines can not only fulfill technical-economic calculations with respect to optimization of the control of the technological processes, operative planning, and cost accounting of the activity of the enterprise and its individual manufactures, but also assure the automatic control of the work at the enterprise as a whole at an optimum technical-economic level. At the

present time, at the plants that make technical rubber shapes and plastics, the "Mars-200" machine is being introduced more widely; it can control up to 200 objects, measure the temperature, pressure, vacuum, etc.

A considerable economic effect and a decrease in expenditures of public labor per unit production at the enterprises of the chemical industry is assured by the utilization of radioactive isotopes and nuclear radiations. Thus, at the Voronezh Tire Plant, radioactive weight gauges with an output of 90 meters per minute have been installed on the high-speed calenders and have facilitated an increase in labor productivity. The annual economy from a decrease in tolerance during the utilization of the mix alone amounted to 300,000 rubles.

One of the criteria for the evaluation of the level of automation of the production processes can be the ratio of the expenditures for automation to the total sum of capital investments. In the United States, at existing plants of the chemical industry these expenditures amount to 10 to 15 percent, at those under construction -- 20 to 25 percent, while in the USSR, on the average -- six to seven percent.

According to the data of an analysis of 12 cases of automation in the United States, which was performed by the Czech economist Yan Auerkhan (Yan Auerkhan. Automation and Society. Sotsekgiz, 1960, p. 52.), labor productivity in American industry increased, on the average, 320 percent, through automation of enterprises alone. At the automated ammonia plant of the "Spencer Chemical Company" in Vicksburg, which produced every 24 hours 210 tons of liquid ammonia, 110 tons of nitric acid, 140 tons of ammonium nitrate, and 350 tons of ammoniated solutions of ammonium nitrate, a shift employs a servicing staff of only 10 people (including the foreman and his assistant). The entire process of producing sulfuric acid from natural sulfur by the "Stauffer Chemical Company" in Richmond is serviced by one person per shift.

The large scale of automation in the United States is determined by the existence of a powerful instrument building industry. The output of instruments to control and regulate the technological processes has increased 10 times during recent years. Analyzers and density gauges of liquids and gases are being produced by more than 30 firms. Naturally the high level of automation and mechanization of the production processes makes it possible to increase

production with a smaller number of people.

Automation of the production processes in the chemical industry of the USSR will, in the general perspective, be based, in the first place, on the advancing development of chemical machine building, instrument building, and the production of means of automation and of raising their operational reliability, the intensification of scientific work in the field of overall automation of mastered and newly mastered chemical processes as well as the raising of the level of economic modeling of technological processes of production and the introduction of their results into practice, and the perfection of the raw-material base of the most important branches of the chemical industry, accompanied by an expansion of the list of production, particularly production from petrochemical synthesis.

The mechanization of labor-consuming processes and the elimination of manual labor in production and auxiliary shops, including the warehousing, intra-plant transport, and others are of great significance for the growth of labor productivity in the chemical industry of the USSR. Overall automation is unthinkable without the overall mechanization of labor-consuming processes. The latter is a mandatory preparatory stage of the first.

At the present time the level of mechanization of labor-consuming operations in the chemical industry of the USSR is very low. The fraction of manual labor amounts to 40 percent. Over 15 percent of the workers are engaged in loading-unloading and warehousing operations. Problems of supplying chemical production with containers, improving the technique of loading-unloading operations, introducing efficient transport means, as well as reducing excessive trans-shipments, improving the storage of freight in transit and by the consumer should be solved even during the next few years. The shipment and storage of mass chemical products and, chiefly, mineral fertilizers, the losses of which during shipment amount, on the average, to about 17 percent, assume special significance. This is equivalent to the loss of the manpower of 5,000 people in the production of these fertilizers, not taking into account the losses of last year.

The most important means of the overall mechanization of loading and unloading of container-unit and bulk freight is the use of special containers and skids. Data published in a number of countries shows that the use of skids in

shipments makes it possible to raise labor productivity in loading-unloading operations, on the average, 10 times, reduce threefold the demurrage of freight cars and motor vehicles during these operations, increase to the same extent the utilization of warehouse space, and reduce transport expenditures by 25 to 30 percent and the losses from damage to freight during loading and unloading -- 30 to 40 times. The capital investments of the chemical enterprises for the acquisition of skids, means of mechanization, and the reconstruction of warehousing are amortized, as a rule, in the course of several months.

The transport of mass flowing freight, such as apatite, phosphorite meal, mineral fertilizers, calcined soda, different resins, carbon black, and others in containers and specialized freight cars facilitates the solution of the problem of the overall mechanization of loading-unloading operations and makes it possible to avoid intermediate storage of production in warehouses. The planning organs and the sovnarkhozes should take special measures to create the necessary fleet of containers, freight cars, and other means of transport.

Large reserves for the growth of labor productivity in the chemical industry are imbedded in the organization and perfection of the repair establishment of the enterprises. Technical advances in this branch of industry in the USSR predetermine the qualitative changes in the organization of the repair servicing of the basic manufactures on the scale of an enterprise as well as of an economic region. At the present time, the enterprises of the chemical industry use over 30 percent of the workers of the branch of industry in the repair of equipment. The fraction of the repair workers of those fulfilling auxiliary functions amounts to 52 percent. Their excessive number leads to a drop in the level of labor productivity at individual enterprises as well as in the branch as a whole.

In order to determine ways for perfecting the repair service, its organization at chemical enterprises in the United States is of interest. According to data of the survey conducted by the editor of "Factory Management and Maintenance," at the enterprises of the chemical, rubber, and petroleum producing industry in the United States, the repair men amount to 15.1 percent of the workers. Also, almost all of them are concentrated in the repair shops. The repair service at American chemical enterprises is

centralized on the scale of the enterprise. It is necessary to point out that non-plant specialization of repair work in the United States is not predominant. Two types of operations are characterized by the greatest degree of non-plant specialization: repair and adjustment of control-measurement, control, and regulating instruments (56 percent) and repair-construction operations (44 percent). In the first case, such a level of non-plant specialization is determined by the technical complexity of the work, the need to utilize special stands and control instruments, which compels the owners of the enterprises to use the services of specialized firms. Non-plant specialization of repair-construction operations is determined by their mass extent and the independence of the nature of the technological process. This makes it possible for the proper firms to conduct work simultaneously at different-type enterprises with fuller engagement of the personnel.

In the chemical industry of the USSR the fraction of non-plant specialization of repair work is much less than in the United States, while the level of specialization of repair-construction operations is approximately three times less. Non-plant specialization of the repair and adjustment of control-measurement instruments in the USSR is not yet organized.

The much higher level of non-plant specialization of individual types of repair operations in the United States, although it affects the drop in the number of people at the enterprises, still does not explain the reasons for the considerably smaller number of repair people in the chemical industry of the United States in comparison with the USSR. Our lag in this field, along with the insufficiently high level of specialization of the repair operations, has been caused by the dispersion of the repair personnel and the large decentralization of repair at the enterprises, low level of specialization of repair in the repair service of the enterprise, weakly developed technical base of the repair establishment, lack of the necessary reserve of equipment, assemblies, and components, insufficient use of new, effective types of materials for the production of equipment, fittings, and pipe lines intended for operation in aggressive media.

What are the ways for perfecting the repair establishment and assuring, by means of this factor, an increase in labor productivity? In the first place, it is necessary to solve problems of centralization and specialization of the

repair service within as well as outside the enterprise. The effectiveness of centralization and specialization of the repair establishment on the enterprise scale hardly causes a doubt on the part of the workers of the enterprises and sovnarkhozes. However, during recent years one of the factors retarding the development of this important trend in improving the organization of production was the use of the system of length-of-service awards by the repair workers of the production shops. Even after the adjustment of the wage scale in the chemical industry, the leaders of many enterprises preferred to maintain a decentralized repair service in order to make awards for length of service. Intra-plant centralization of the repair service and specialization of the repair operations should become a mandatory element of the system of planned-preventive repair at chemical enterprises.

Our industry has great advantages over the industry of any capitalist country in the creation of specialized repair enterprises and enterprises which make single-type replaceable assemblies, components, reinforcing materials, etc. That is why non-plant centralization and specialization of the repair service on the scale of one or several economic regions assure an increase in labor productivity.

In connection with this, the experience of the Volgogradskiy Sovnarkhoz in organizing centralized servicing of a basic industry deserves special attention. The sovnarkhoz has organized the centralized production at one plant of all metal shapes used at enterprises of the given region, centralized repair of the power equipment at one enterprise, a laboratory has been organized for the repair of all control-measurement instruments, and a mechanical repair plant is being organized to service the enterprises of the chemical industry. According to the calculations by Volgograd specialists, in accomplishing all the projected measures for the specialization of auxiliary operations within the enterprises and the sovnarkhoz as a whole, with consideration of the growth during the seven-year plan of the volume of production to the extent of 3.9 times, the number of auxiliary workers required for servicing the industrial enterprises will be 12,000 less than now. This indicates large reserves for raising the labor productivity through better organization and perfection of auxiliary services at the enterprises of the chemical industry.

It has become urgent to organize large, technically improved specialized plants for the production of spare

parts, components, fittings, reinforcements, and others for the needs of the chemical and petrochemical industry, which would serve the enterprises of several economic regions. The accomplishment of the enumerated measures for improving the repair service of enterprises in the chemical industry will assure an increase in labor productivity of 2.1 times, including the nitrogen industry -- 3.9 times, and in the production of synthetic rubber and alcohol -- 2.9 times.

Thus, in the struggle for a sharp increase in labor productivity, a large and ever growing role is, along with the basic factors of technical progress, being played by the perfection of the organization of production and, in the first place, the organization of auxiliary services -- repair of equipment, intra-shop and intra-plant transport and analytical and technical control.

The solution of the historic tasks outlined by the Party Program, which provide for an advancing growth of the output of the chemical industry during the period of the building of a material-technical base of Communism, will even in the not too distant future make it possible to overcome the lag in this field and by the end of the next twenty-year period exceed the United States not only in the volume of production but also in the level of labor productivity in this branch of industry.

1306

CSO: 1830-N

## GREEN LIGHT FOR GLASS PLASTICS

[Following is a translation of an article by B. L'vov and M. Slotintsev in Pravda, Moscow, 14 Feb 63.]

The November Plenum of the Central Committee of the Party projected a wide future for the use of plastics in the different branches of the national economy. Glass plastics occupy one of the leading places among these. These are plastics in which the filler consists of materials obtained from glass fiber.

The importance of glass plastics has increased particularly with the appearance in industry of synthetic resins which harden at ordinary temperatures. This made it possible to develop high-strength, light constructions of practically unlimited sizes and most complex configuration. In many cases, series shapes from glass plastics can be made on continuous, automated or mechanized lines.

It has been estimated that the use of glass fiber and glass plastics as electrical insulating materials for electrical machinery, planned for production in 1965, can give a saving to the extent of over 150 million rubles through a decrease in expenditures for the production of the machinery alone. Thus, glass plastic insulation of electric motors in cutting machines increases their service life fourfold. The power of electrical machinery for the same weight increases one third. As a result of the wide introduction of glass plastics into the electrical engineering industry, there is a drop in the consumption of ferrous and non-ferrous metals, many millions of meters of textile products made of natural fibers -- cotton and silk -- are dispensed with.

It is possible to successfully make pipes from glass plastics. The replacement of only half of the steel pipes

used for the hydraulic mining of coal will save the state about 10,000 tons of metal. The replacement of only 3,000 kilometers of metal pipes for city gas pipe lines will save almost four million rubles. The production of pipes from glass plastics will make it possible to collect the valuable raw material -- concurrent gases, billions of cubic meters of which are annually burned in torches. The production of pipes from glass plastics for main pipe lines can save the country hundreds of thousands of tons of metal.

Glass plastics have great advantages when used in shipbuilding. Vessels of such materials are light, fast, and of increased cruising radius. A diesel ship has, for example, already been built of glass plastics for 65 passengers and cutters, life boats, and sports boats have been built.

In construction engineering, light, semitransparent sheet roofing and facing materials made of glass plastics for industrial buildings as well as for structures of light and portable types deserve special attention. The commercial output of such materials is planned at a number of enterprises.

It would seem that a wide path would be opened for the mass production and application of these remarkable materials. However, the development of the commercial output of glass plastics is at the present proceeding at slow rates. The Gosplan USSR has repeatedly "corrected" the plans of development of the production of glass plastics, with the aim of a reduction. The output of glass fiber for glass plastics, with respect to quantity and assortment, was not coordinated with the growth of the production of glass plastics.

In the development of new, highly effective methods for the production of the starting materials and the very shapes made of glass plastics and in the investigation of their properties and fields of application, the leading role belongs to the design and scientific research organizations. Scores of industry organizations joined this work. Practice shows that only well organized and capable personnel of researchers and technologists who have been given design support and a machine building and testing base are capable successfully and within short periods of time of solving complex problems of production of shapes made of glass plastics.

Nevertheless, a majority of the leading institutes engaged in problems of the application of glass plastics do not have the necessary production areas, mechanical base, and design support. As a result, important problems of the introduction of glass plastics are being solved extremely slowly. The cadres are dispersed among many institutes. The system of the State Committee for Chemistry has, for example, an institute of glass fiber and institutes of plastics, which are developing new starting materials for the production of glass plastics. Not one of these institutes has the possibilities for creating standard processes for the production of shapes, develop new compositions, and investigate the properties of glass plastics.

The report by Comrade N. S. Khrushchev at the November Plenum of the Central Committee of the Party posed urgently the task for the accelerated development of the chemical industry and universal increase in the production of plastics, including glass plastics. The duty of the workers of industry, scientific research, planning, and design organizations, industry committees, and economic organs is to solve this task more rapidly. It is necessary to develop without delay the mass production of glass plastics.

1306

CSO: 1830-N

## LAGGING CONSTRUCTION OF HERBICIDE SHOP AT THE ZHDANOVSKIY BY-PRODUCT COKE PLANT

[Following is a translation of an article by A. Krulevetskiy in the Russian-language newspaper Rabochaya Gazeta (Workers' Gazette), Kiev, 6 Feb 1963.]

The shop for the production of herbicide is a starting object of this year. The farm workers are waiting with impatience for its production.

The shop is being constructed by the efforts of the "Uglekoksokhimremont" Trust and the division of capital construction at the plant.

It must be said frankly that the construction administration of the "Uglekoksokhimremont" is not able to conduct the work at the required rate. And if one is to speak seriously about the high-speed construction of the shop, then it is necessary, first of all, to assign a stronger contractor, for example, one of the administrations of the "Azovstal'stroy." It is necessary also to intensify the delivery of equipment. And it is also time to finally solve the problem of financing the construction.

It is understood that we are not relinquishing responsibility for the fate of the object. From now on we will pay more attention to the organization of labor on the construction project and supply it better with materials and machines. However, without the perceptible assistance of the sovnarkhoz, the required rate will not be attained.

1306

CSO: 1830-N

## PRODUCTION OF METATOLUIDINE FROM WASTES

[Following is a translation of an article by A. Belokon' in the Russian-language newspaper Rabochaya Gazeta (Workers' Gazette), Kiev, 8 Feb 63.]

You look at the color movie and you are delighted by the tints of colors, you read the captions which list the names of the creators of the film. Of course, you will not find there the name of Ivan Alekseyevich Roldugin. An apparatus operator at the Rubezhnoye Chemical Combine is not engaged in producing movies and does not have the bright lights of Jupiters. And still the work appeared on the screen with his participation. Why? Soon it will all become clear to you.

One of the mandatory components for movie film colors is metatoluidine -- a brownish, viscous liquid. Previously it was being produced from a high-cost raw material, by means of a complex and long synthesis. All this was rather inconvenient, but what are you going to do -- if it is necessary, it means that it is necessary.

One of the corners of the combine, situated afar from the basic shops, has been nicknamed the "dead field," "tank cemetery." Now it is difficult to remember who was the first to give it such a name and, of course, it is not so important. Actually, the tanks were standing and getting dusty with useless freight -- the wastes of a large manufacture. There was no sense in shipping these anywhere, it is a pity to destroy and harmful to pour out. These also contained the so-called "cold mother liquor" -- one of the involuntary "culprits" of the origin of this reporting.

In the central plant laboratory they were looking for ways to reduce the cost of metatoluidine. It was there that they decided to "empty" the forgotten tanks and to

check the value of their contents. They made analyses and performed experiments. And in the final end, the mother liquor which previously interfered with everyone turned out to be the "progenitor" (by means of synthesis and other reactions) of an important intermediate for dyes which is extremely needed by the movie factories. And the most important thing: the metatoluidine now costs a third of what it did before.

Two years ago the commercial production of the new product was started at the combine. The best apparatus operators were sent here. And among these was Roldugin. They knew whom to send in case of a "hitch," to be the first to blaze an unexplored path. The shock worker of Communist Labor, capable, skilled specialist, leader of the school of advanced know-how. The man has a taste for the new and he loves to search. And the comrades trust him: Ivan Alekseyevich is a member of the Party bureau and is in the commission to control the activity of the administration.

The apparatus operator inherited quite an establishment -- 23 units of equipment, using the language of the suppliers. Seven mandatory instructions have to be learned by points first before one starts to work. And this is far from the idea of an overcautious man -- all the apparatuses must be known to the finest and to sense at once their "sore spot".

And still the devil is not as terrible as he is painted. Here this saying was very much to the point. Ivan Alekseyevich mastered thoroughly the stages of the technological process. If something became foggy, he did not consider it a chore to consult with the researchers in the laboratory. Thus, two clear prerequisites for success gradually became apparent: to achieve good stirring of the mass and not to lower the temperature of the reaction. On paper, these requirements are, of course, very elementary. In practice, all turns out to be somewhat more complex.

There is such a term as "upper limit" which is used in different branches of technology. This means a rather simple thing: "utilize all possibilities in the construction or process in order for the efficiency to be as high as possible." In the case of Roldugin, such an "assistant" was the temperature. If it is raised (within the allowable limits, of course), it is possible to shorten by much the length of the process which lasts several days. In the given case, almost 12 hours were gained; true, only

theoretically.

Not everything works as desired. Unforeseen circumstances interfere. The thermometer column begins to run upwards and all at once there is a sharp increase in the sludge sediment and this means that the reaction is again slowed down. What is to be done, how is one to proceed? A way out was found also together: a second pressure line was installed in the apparatus -- sort of a "janitor-cleaner." The additional operations reduced somewhat the total time saving, but as a whole, the process was reduced by two hours.

Only Ivan Alekseyevich was able to solve one thing -- a new "nut" was to be cracked. How many of these there were -- it is difficult to remember: it was necessary to reduce the consumption of steam and utilize all wastes. And still the annual program was completed three months ahead of time. The apparatus operators A. S. Belovanenko, V. A. Masak, and others followed in the paths of Roldugin. The brigade produced tens of thousands of rubles of above-plan production.

This year more cares were assigned to Roldugin. It is not enough for him alone to work well -- it is necessary also to teach others. After all, Ivan Alekseyevich is one of those 15 notable, foremost workers of the republic who appealed to all the workers in the Ukraine to discover and put to use of the seven-year plan the internal reserves and achieve a level where the records of individuals would become the achievement of all. Even now he has many followers in the city -- the bureau of the city committee of the Party supported the initiative of Roldugin and recommended that this experience be studied everywhere.

When you enjoy the tints of colors on the screen, you should remember the apparatus operator from Rubezhnoye. Plain and heavy is his daily working attire -- cloth working clothes, rubber boots, gloves, apron. But the labor of one of the modest servants of witch-chemistry is needed by the country.

1306

CSO: 1830-N

## LACK OF COORDINATION AT THE DNEPRODZERZHINSK NITROGEN FERTILIZER PLANT

[Following is a translation of an article by A. Yalovoy in the Russian-language newspaper Rabochaya Gazeta (Workers' Gazette), Kiev, 10 Feb 63.]

The Dneprodzerzhinsk Nitrogen Fertilizer Plant is a large supplier of mineral fertilizers. During the years of the seven-year plan alone, the personnel of the enterprise increased the output of fertilizers by almost 80 percent and expanded their assortment.

The personnel of the advanced plant which earned the title of "Communist" are doing much even now to increase the production capacities and the perfection of the technology.

Unfortunately, the Dneprodzerzhinsk chemists are not always getting the proper support in the solution of this great and important problem.

Alongside the plant the affiliate of the State Planning Institute of the Nitrogen Industry has been functioning for several years. Such a neighborliness is mutually convenient and advantageous. And still the planning and estimate documents are arriving at the plant with great delays.

What is the matter? First of all, the State Committee for Chemistry is guilty of these delays. In its planning tasks, it does not coordinate the target dates for the startup of new capacities with the schedule for the issue of the documents. For example, in the second quarter of this year it was planned to expand one of the basic shops. But strange as it seems, the planning documents for the construction of the electric furnace -- in essence the decisive unit -- have to this day not been received and the

equipment has not been ordered. And this is not the only case. It is sufficient to say that for this year every fourth starting object has not been supplied with the planning and estimate documents. As a result, the task for increasing the capacities is not being fulfilled and the construction of important objects is being postponed or is reassigned for a later time.

It is necessary to expect that the leaders of the Pridneprovskiy Sovnarkhoz, Gosplan of the Ukraine, and the State Committee for Chemistry are paying heed to the demands of the Dneprodzerzhinsk chemists and will shorten the vexatious break that is interfering with the matter. For this purpose, it is expedient, in the opinion of the leaders of nitrogen fertilizer plant, to enlarge the existing affiliate of the institute and to give it greater independence. This is required by the interests of production.

The chemists are paying a dear price for the negligent planning. At one time the Gosplan USSR determined the target date for the startup of the liquid-fertilizer shop and the catalyst shop -- the fourth quarter of 1963. In accordance with this target date, the plant ordered the equipment and concluded agreements with the builders. But after a certain time, the date for the startup was locally moved to the second quarter without any kind of agreement. The accelerated development of enterprises of the large-scale chemical industry is, of course, a necessary matter. But in the given case they acted very rashly. After all, no one even thought of speeding up the production and delivery of the equipment.

The constant battle with the suppliers of the technological equipment takes away much effort and energy. It is necessary to send hundreds of telegrams, outfit pushers and, what is important, not always with useful results. Even in 1960 the enterprise received an order for powerful compressors from the Penza Plant. Then it was mechanically shifted and moved to the rear. And after all, a plan was already made for the technological line in which the compressor was to operate. Then the personnel mobilized the creative efforts of the able and measures were rapdily introduced to intensify the processes. The builders helped; within a record period they installed the complex equipment. The situation was, of course, corrected. But again at a very dear price.

The chemists have serious complaints also against the builders. A definite number of construction and installation administrations has been assigned to the objects of the plant. But the leaders of the Ministry of Installation and Special Construction Operations of the republic and of "Metallurgkhimmontazh" are constantly interfering with their work. At their instruction, the builders are frequently detached for other enterprises. Even now 200 people who should work at the plant are on travel. All this brings harm. Last year alone, the construction organizations did not utilize hundreds of thousands of rubles because of the lack of workers.

Shortcomings in planning and in the receipt of planning-estimate documents and equipment as well as a shortage of builders make it impossible for the personnel to develop in time and completely the enterprise and to increase its capacity. Dnepropetrovskaya Oblast industrial committee of the Party, the leaders of the Pridneprovskiy Sovnarkhoz with the help of the Gosplan of the Ukraine and the republic sovnarkhoz should finally solve the urgent problems and afford real help to the enterprise.

The Dneprodzerzhinsk chemists are doing much in order to make fuller utilization of the internal reserves. At the end of last year they introduced many valuable measures in accord with the new technology and for the intensification of the production processes which were not projected by the planning tasks. Because of this, the annual output of the equipment increased by several thousand tons of ammonia. However, this reserve was not taken into account by the planning organs in the preparation and approval of the plan for the current year.

Recently the personnel turned to the Gosplan of the UkSSR with a plea to increase the annual plan and to include in it and independently, without any instructions, the capacities that were placed in operation. The patriotic plea of the chemists deserves approval. The addition to the program, proposed by them, will be a good present to the farmers on the Socialist fields.

1306

CSO: 1830-N

NEED FOR LABORATORY EXPERIMENTS AT THE MOSCOW TIRE PLANT

[Following is a translation of an article by G. Korbe in the Russian-language newspaper Moskovskaya Pravda, Moscow, 26 Jan 63.]

At the enterprises of the sovnarkhoz there are already functioning or under development 60 laboratories of economics and production organization and 135 sectors of technical-economic analysis. Work has been started by 116 public bureaus of economic analysis and 40 public standardization bureaus. Many of these organizations have already accumulated considerable know-how.

Today its leader tells about the activity of the laboratory and production organization at the tire plant.

We have become accustomed a long time ago to the fact that experiment is an indivisible part of scientific research. We know that it is impossible to dispense with it, if one works on a fundamentally new design of a machine or he is creating an unknown polymer, or is raising a new type of wheat.

Scientific experiment is something which everyone understands and is accustomed to, but economic experiment, not so much in a research organization, but at an enterprise -- this already raises doubt on the part of many. Nevertheless, economic experiment is necessary and, if nowhere else, precisely at a plant.

Now so-called "limited piecework" has been introduced at particularly important sections. The concept is new; such a system of payment for work was previously not used by us and its experimental verification was, at first, met with distrust.

At the enterprises of the tire industry the cost of

materials amounts to about 90 percent of the cost of the output. Under these conditions, a violation of the technology is particularly dangerous. If there are rejects at the plant, the materials, which amount to nine tenths of the cost of the tire, are wasted and lie as a heavy burden on the cost of production. But suppose there are no rejects? This can result in an accident and surely in a decrease in the life of the tire. The customer -- the automotive establishment -- and not our plant will suffer a loss. The difference is not great -- in all cases the state suffers.

Thus, in the case of our plant, the important thing is an improvement in the quality of production. That is why we have decided that it is necessary to introduce a number of additional operations and limit the norm of output.

We started to experiment, we produced a thousand tires in accordance with the new technology, we took those that were just produced previously and we tested them in operation. In the case of the tires produced with a limitation of the output norm, the mileage was 10 percent higher. Thus, we demonstrated the feasibility of the proposed novelty. And half a year later we boldly introduced limited piecework in all the basic shops.

Limited piecework was introduced in the following manner. The technologists and standardization people studied the methods of the foremost workers. A time and motion study was made. After we obtained a clear picture of what we have, it was easier to project what it should be. After studying the resulting data of the technology, we introduced the new operations which were needed in order to improve the quality of the tires. We selected the optimum time for each of the operations. We compiled a new technological flowline which included all the operations -- the new and the old.

It happens also at our enterprises that, in striving to fulfill the task to reduce the cost of production, the leaders of the shops and the technologists aim for unjustified simplification of the technology and begin to cut out materials where it is not permissible. In a word, they act "in favor" of themselves and to the harm of the consumers, impairing the quality of the production. We decided to create a system of material interest which would exclude such an approach.

There are sections and shops at any plant where the indices which are used to reward the engineers and foremen arouse not doubt. The power shop, for example, belongs to these. And how is one to deal with the workers in the basic production?

It is necessary once more to recall the high cost of the materials used by the plant. The most simple way of reducing the cost is to save rubber. It is sufficient to change to the slightest degree the tolerances in order to credit to the account of the enterprise an above-plan saving. And what saving is to be handed to the customers?

For this reason, we evaluate the activity of the shop foremen and technologists on the basis of their concrete participation in the final results of an increase in the quality and drop in cost of the production. Moreover, each section has its definite indices on the basis of which the effectiveness of the work of its leaders is determined.

We are limiting the output norms. And at the same time we are increasing the volume of production, using the same areas, and fulfilling the annual plans ahead of time. How is this done? Of course, this does not take place without the introduction of the new technology, without improving the technology, and without a reexamination of the outmoded norms. But the main increase in the output was obtained by us through an increase in the coefficient of shift operation.

Number three is considered the maximum of this coefficient. But three is not the maximum figure. Shift operation at our plant is three and a quarter. We use the three-brigade method of work: three shifts of eight hours each and a 16-hour break on Sunday. These 16 hours are used for the weekly repair of the equipment. The off days are given to the workers on a sliding schedule after three days.

Calculations of the saving resulting from the introduction of the new schedule are rather simple. How many work hours in a week with ordinary three-shift operation? 123. But in our case? 152. The effectiveness of the utilization of the basic reserves increased by 25 percent. Here you have simple calculations!

All these novelties have been introduced as a result of economic experiments. However, no matter how paradoxical,

we have no right to such experiments and for some of these we even incur penalties from the sovnarkhoz. There cannot be two opinions as to whether this is correct or not. Experiments have, in accordance with general admission, given, in the final analysis, good results. And we feel that the plants should have the right for economic experiment. Only in this manner is it possible to discover reserves, increase the output, and improve its quality. It is also important that all the personnel help the economists.

In our laboratory there are four persons. Moreover, we have four specialists of different trades: work expert, technologist, financial expert, and planner. It is pertinent to note in passing that it is not necessary to have large staffs in such laboratories. It is necessary to select from the mass of problems the most important and the most necessary. It is important to recruit people from related fields in their solution.

In the fulfillment of the experiments and the introduction of their results into practice we are being assisted by the public bureaus of economic analysis, the economic section of the technical council of the plant, and the recently created university of technical progress and economy. The students of the university -- there are 235 of these -- not only attend lectures on the improvement of the planning and control of production, but are also developing concrete economic recommendations. It is necessary to say that all this is being done under the leadership of the Party organization of the plant. And the leaders of the enterprise are paying considerable attention to our work.

In the new year we will continue with experimentation. The plan envisages a "stretching" of one more "bottle-neck" at the plant -- to eliminate the lag of the preparatory shop. We are seeking the solution not through an increase in the equipment and manpower but through better utilization of the existing capacities in the shop, in a more expedient system of production lines, and in a decrease of trans-shipments.

Our interest is not decreasing, either, with respect to improvement in quality. The laboratory finds the causes for the rejects and is engaged in finding ways for reducing production wastes and the possibility of the utilization of direct wastes.

In 1963 the plant is going to start the production of tires of the new type "R" for the Moskvich motor vehicles and "RS" for the "ZIL"130' trucks. This preparation is being conducted by the laboratory together with the entire personnel. We traveled to the Yaroslavl' Tire Plant where we studied the production directly at the work places. This will help us to avoid many errors.

And so, experiment is necessary. But in order to conduct it, it is necessary to select correctly the direction. Experiment requires serious preparation. Moreover, all the active people of the plant should participate in its preliminary discussion: the workers, foremen, and engineers. For the successful accomplishment of the experiment, help is needed from the scientific research institutes. At the present, we do not have such help.

Only in this manner can the basic task of any economic experiment be fulfilled: an increase in the volume of production and an improvement in the quality of the production by the enterprise.

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# LAGGING CONSTRUCTION OF THE KUYBYSHEV SYNTHETIC RUBBER PLANT

[Following is a translation of an article by P. Levchenko in the Russian-language newspaper Komsomol'skaya Pravda (Komsomol Truth), Moscow, 23 Jan 1963.]

All our life we have been building locks, dams, and electric power stations on the Volga: in Uglich, Rybinsk, Kuybyshev, and we have learned our trade well. And then we had to build chemical shops, install complex apparatuses in which miraculous transformations will take place. For us this was the virgin land. But we understood: the Party and Government have assigned to the personnel of No 1 Administration of "Kuybyshevgidrostroy" a responsible task of state importance: it is necessary, within a short period of time, to build the Kuybyshev Synthetic Rubber Plant -- the country's largest.

A little over three years passed and on the outskirts of the city of Stavropol'-on-the-Volga a giant plant grew up. It was not easy at first. All around was the uninhabited steppe -- without roads, without communications, without housing. But hundreds of young boys and girls who arrived on Komsomol travel assignments to the All-Union crash construction projects did not shirk before the difficulties.

Much has been done during the three years. But all this is only the beginning of the "large-scale Volga rubber industry." In 1963 our personnel are still faced more complex tasks: it is necessary to place in operation the second stage of the chemical giant.

Only 10 months remain before the startup of the second stage of the enterprise. But it is necessary to build a

complex of shops, in essence, another large plant. Now every day counts dearly at the crash construction project.

However, there are circumstances which retard the growth of the giant of chemistry. We are being let down by the "Neftekhimmontazh" Trust of the Ministry of Construction RSFSR. The builders have made ready for the installers the necessary conditions for productive operations. They gave them the plans, but the administrations of the trust cannot in any way make the schedule. The "Montazhkhimzashchita" and the "Lifmontazh" organizations of the ministry have generally not started the work. The installation organizations of the ministry have a constant shortage of people, equipment, and housing. Many of these have not even established the bases of a building industry. We have more than once appealed to the leaders of the ministry and proposed that we jointly develop actual measures in order to make up the lost time. Our appeals are not being answered in the ministry.

The construction project is in a feverish state because of the shortage of concrete and mortar, particularly of special brands, and metal and reinforced concrete shapes. All these materials are being supplied to us by the administration of secondary enterprises, which is situated in the same Stavropol'-on-the-Volga. The materials are available but they are frequently sent to other addressees. Our administration and the "secondary" suppliers are subject to two main committees of the same Ministry of Power and Electrification USSR. And so the two main committees cannot agree while an important construction project is on a starvation diet.

The State Committee for Chemistry of the Council of Ministers USSR has to this day not issued all the technical documents for the second stage of the enterprise, although all target dates have already passed. The planners are making large changes in the already finished drawings and this leads to innumerable alterations.

In order to finish the second stage of the plant in time we should receive all the equipment during the first months of this year. However, they are planning to deliver the equipment in the course of the entire year. Actually, the construction project will receive many apparatuses only in October-November and these will be installed by the end of the year only. But there will be no time left for testing and mastering the equipment. Besides, the

plan for the delivery of the equipment is continually not being fulfilled.

Our youthful personnel are appealing to the engineers and workers of the supplier plants: "Take the orders from the crash Komsomol construction project under strict control! Do not prolong the production of equipment for the manufacture of the valuable material -- isoprene rubber!"

During recent years Stavropol'-on-the-Volga has sharply changed its image. It is becoming a city of the "large-scale chemical industry." Thousands of people are working on the construction and in the enterprises. However, the plans with respect to housing and cultural-service organizations are sharply lagging behind the growth of the population. Even now the supply of water to the city is becoming an urgent problem.

In appearing at the November Plenum of the Central Committee of the Party, N. S. Khrushchev said that it is time to put an end to the superficial and shortsighted approach to the development of the chemical industry and that it is necessary to evaluate with economic know-how the great advantage which the national economy will get from the large-scale chemical industry. The several thousand builders and operators of the Kuybyshev Synthetic Rubber Plant understand the full importance of the matter assigned to them. Our youthful personnel will not spare efforts and energy so that the one more Volga giant will stand up beside the power giant.

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# INCREASING POLYMER OUTPUT BY THE FERGANA HYDROLYTIC PLANT

[Following is a translation of an article by N. Semanov in the Russian-language newspaper Pravda Vostoka (Truth of the East), Tashkent, 23 Jan 63.]

The personnel of the Fergan Hydrolytic Plant started with confidence the fifth year of the seven-year plan. The country received above the plan thousands of decaliters of ethylalcohol, 138 tons of furfurol, 214 tons of xylitane, 357 tons of the "FA" monomer, 20 tons of catalyst, and 132,400 tons of oxygen.

The Soviet Union's first shop for the production of collactivite has been placed on stream. This is the start of the chemical processing of the waste from the hydrolytic industry -- lignin.

In the hydrolysis, 30 percent of the raw material is lignin. Central Asia produces about 50,000 tons of lignin which is utilized only partly in the form of fuel briquets. Its transport is a labor-consuming and costly operation.

Industrial processing of lignin converts it into a valuable chemical raw material and the country can dispense with activated charcoal which is shipped in from Permiya.

The cost of collactivite, in comparison with activated charcoal, is one and a half times less, which will give the plant a saving of about 100,000 rubles per year.

The organization of collactivite production is the result of great intensive work by the staff of technologists and mechanics. With its own efforts, the plant designed and installed a unit for drying lignin, a system was devised for trapping sulfur gases, and much was done for the corrosion protection of the equipment. Now the

personnel have assumed a new task -- find ways to retain the activity of the collactivite in order to supply it not only for its own manufacture but also for the Chimkent Hydrolytic Plant.

Last year we organized the technology of commercial production of a new type of furane compounds -- tetrahydrofuryl alcohol, good solvent and plasticizer of high polymers. This year the output of this production will increase ten times.

The intensive introduction of plast-concrete -- a new type of polymer material based on the "FA" monomer -- is continuing. This polymer is widely used instead of metal for the protection of water dams.

The plant is producing furyl resins of new brands which, unfortunately, have not yet found application in the republic. Scientific research institutes, enterprises, building organizations, kolkhozes and sovkhozes should closely and in a business-like manner take up the introduction of the new polymer materials. Their field of application is most diverse. Furyl alcohol, also produced by the plant, can be used to impart water-gas-gasoline impermeability to concrete and reinforced concrete constructions and to protect sewage systems and chemical equipment.

During the last three years scores of measures have been accomplished for the perfection of the technological process decreasing the costs of production, increasing the output and raising labor productivity.

A great contribution has been made toward the development of the hydrolytic industry by the following innovators of the plant: chief mechanic V. Suvorikov, shop chief A. Pavlov, shop mechanic A. Demekhin, shift chief A. Torchants, the workers I. Tiralev, G. Knyazev, G. Plishkin, G. Mordukhayev, N. Komarov, and others. During the year they submitted 108 innovator suggestions.

The construction of new shops for the production of maleic anhydride and endothal -- the world's best desiccant for cotton as well as a good defoliant -- is in full swing. The shop will be placed in operation during the current year. It is planned to build other shops which will produce over 10 new items. The construction of a yeast shop with a capacity of 4,000 tons a year is starting.

When it is placed in operation, Fergansкaya Oblast will be completely supplied with highly concentrated feed for animals.

In the fifth year of the seven-year plan production will increase by 17 percent. The wide use of furfurol and its derivatives will give the chemical industry available and low-cost materials for the production of plastics and numerous intermediates of basic organic synthesis.

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# SPECIALIZATION AND UTILIZATION OF RESERVES IN THE TIRE INDUSTRY

[Following is a translation of an article by K. Gorlin, I. Manvelov, P. Al'man, and A. Shakh in the Russian-language newspaper Ekonomicheskaya Gazeta (Economic Gazette), Moscow, No 7, 16 Feb 63, p 15.]

Once a week, evenings, the economic leaders of the Moscow plants of the rubber industry gather for courses to improve their qualifications. The studies take place in the Institute of Fine Chemical Technology imeni M. V. Lomonosov and sometimes we travel as a group to some plant and there we take up a definite subject on the economics of production.

And so it was that at one of the studies we took up the problems of specialization and utilization of the reserves of this branch of the chemical industry. There was a heated exchange of opinions as to what has been solved and what has not yet been done in this respect. This article is the result of this discussion.

It is known that at the present time the requirement by the national economy for tires as well as technical rubber products (conveyor belts, sleeves, rubber glands, and others ) is not being completely satisfied. In order to eliminate the shortage, it is necessary to solve in an overall manner several problems: increase the volume of production and sharply raise the quality of the production; expand the assortment of products and enlarge the tire-repair business, etc. However, the decisive role in this should be played by the correct specialization of the tire plants and enterprises of technical rubber products.

Here it is necessary to take into account the existing difference in the nature of both types of manufactures.

Tire plants essentially produce uniform shapes but different in dimensions and design. The technical rubber products plants give, as a rule, production which is divided into a very large number of groups. Each of these has its own specificity.

For this reason, problems of the further specialization of the tire industry reduce themselves essentially to the most efficient distribution among the plants of the entire volume of production in the assortment projected by the plan. From this same point of view, the assignment of the production of some or other groups of products to individual enterprises is important for the enterprises which make technical rubber products.

The advantages of specialization in both cases are indisputable. These mean an increase in labor productivity, an increase in the volume of production per square meter of production area, a decrease in the cost of the shapes, and others. But here not everything has been worked out. Specialization is proceeding far from satisfactorily.

The Moscow Tire Plant is now producing tires of 47 designations. The assortment of production developed over a number of years. As is known, the capital has two motor vehicle plants -- "ZIL" and compact-car plants. The Moscow tire workers are obligated to produce, first of all, for these consumers.

It is precisely with consideration of their demands that the reconstruction and expansion of the tire plant is being accomplished. As a basis for this, we took the projected data on the output of motor vehicles, in particular for 1965. It is planned to reduce twofold the assortment of production by the Moscow tire workers and to stress specialization of production. However, here we encounter lack of coordination. In the selection of the tire assortment, consideration was given to the target dates for the organization of the production of new brands of motor-vehicle tires.

Unfortunately, the start for the production of certain types of trucks at the Plant imeni Likhachev is being postponed, as we know, to later target dates and their quantity, which it was planned first to produce by 1965, is being changed. This is threatening to cause large complications not only at the Moscow but also at tire plants presently under construction; their specialization can be impeded and

the technical-economic indices of production impaired.

In order to obtain the proper effect from specialization, it is necessary to have a clearer coordination of the target dates for the changeover of the motor vehicle plants to the output of vehicles of new models and the target dates for the reconstruction and expansion of the tire plant in the capital. And now we underscore that there is observed a lack of coordination.

The problems of specialization of production for such a technical rubber products plant as "Kauchuk" are burning and important. First of all, we speak here about a decrease of the assortment of production at the expense of conveyor belts and flat drive belts. Such a step would be extremely necessary from an economic point of view. In the first place, at present a portion of such products is shipped from Moscow for thousands of kilometers to the east, to Siberia, and even further. In the second place, at the "Kauchuk" Plant this production is distributed in old, unsuited buildings.

If the production of conveyor belts and flat drive belts is handed over to other plants, then the assortment of production at the "Kauchuk" Plant will decrease substantially. By means of greater specialization at this plant, it will be possible to increase the output of such extremely necessary production as molded and non-molded shapes. We wish to point out their marketing in the future will be completely concentrated in the economic regions close to Moscow.

In the interests of specialization, it is necessary to start in a business-like manner with the unification of the production of rubber products. Now the same "Kauchuk" Plant is producing rubber sleeves of the most diverse constructions, types, and dimensions. We know well that such sleeves, and moreover of such a wide assortment, are being made by other related enterprises. We feel that each of these should be assigned the output of sleeves of only a definite construction, form, and type.

The problems of the specialization of technical rubber products plants are quite complex and, in addition, confusing. But they must be solved. This will bring a perceptible economic effect.

Here, much is connected with the acceleration of the

construction of new enterprises for the production of technical rubber products. The creation in the eastern regions of sufficient capacities, for example, for the production of conveyor belts and flat drive belts, will eliminate the need of shipping these into here from afar and will assure correct specialization of the "Kauchuk" Plant and other existing plants.

However, it is not necessary to hope that the acceleration of the startup of new capacities alone will solve all the problems. It is necessary to find also other ways for improving specialization. Once more we underscore the advantage of reducing the assortment of production at the same "Kauchuk" Plant. Just as last year, this year too it is planned to produce rubberized fabrics. This is entirely not in accord with the profile of the plant where production is geared for shapes of complex construction. The incorrect planning hinders to a large degree the fulfillment of a more clear specialization of the "Kauchuk" Plant.

We also feel that it is necessary to create specialized enterprises for servicing the technical rubber products plants. We are speaking about the following. At the present time, these plants have a cumbersome molding establishment. The production of many shapes requires vulcanization molds of complex construction, made with great accuracy. At the present time, these molds are supplied by the customers. And among these are enterprises of the most diverse industries and departments. Under these conditions, the number of mold suppliers is in the hundreds. Vulcanization molds cost much and their quality is frequently poor. And how much time is spent for the coordination of problems connected with the production of the molds! The procedure is very lengthy.

The way out, in our opinion, is to equip specialized machine building enterprises in the areas where there are concentrations of the technical rubber industry to produce molds and other accessories. In particular, one of these should service the plants of this industry, which are in Moscow and in the Moscow area. It is necessary also to have specialized bases for the centralized repair of plant equipment and control-measurement instruments.

We cannot keep silent about the apparent unsatisfactory situation with respect to the production of equipment for the enterprises of our industry. A number of new plants is under construction and the reconstruction and expansion of

many existing plants are proceeding on a wide scale. Orders for equipment are growing. But, in essence, there are no specialized machine building plants to produce it.

Modern enterprises -- tire and technical rubber products plants -- cannot be visualized without a multitude of conveyor systems. It is sufficient to say that at the Dnepropetrovsk Tire Plant the length of the conveyors is measured in scores of kilometers, in the shops of the Moscow Tire Plant their total length is equal to 19 kilometers. Closed pipe lines are used for the pneumatic feed of raw materials and products, pushing conveyors with addressing of the freight, and others.

And who is making such equipment? It is not being produced by the machine builders. We do not even have a specialized organization which would design the conveyor equipment for plants of the rubber industry. That which is being done in this respect in the All-Union Scientific Research Institute of Hoist-Transport Machine Building cannot be taken seriously: the volume of work is obviously insufficient and its quality does not satisfy the requirements of today.

That is why problems of economically more advantageous specialization of the enterprises of our industry are closely intertwined with the tasks of creating specialized machine building plants for the production of vulcanization molds and the output of new equipment.

In the previous union Gosplan all these problems did not find a correct solution. In accordance with a decision by the November (1962) Plenum of the Central Committee of the Party, the State Economic Council has been reorganized into the Gosplan USSR, and a council of National Economy USSR has been established. We calculate that these organs will determine the true line in specialization of our branch of the chemical industry and will put into practice. On this the increase in the output of tires and technical rubber products depends to a great extent.

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