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No 10, October 1987

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EKO: Economics & Organization of Industrial Production

No 10, October 1987

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Impact of Perestroika on Enterprises Discussed

18200012a Novosibirsk EKONOMIKA I ORGANIZATSIYA PROMYSHLENNOGO PROIZVODSTVA (EKO) in Russian No 10, Oct 87 pp 3-30

[Discussion by B. P. Kurashvili, doctor of jurisprudence, Institute of State and Law of the USSR Academy of Sciences (Moscow): "Perestroika and the Enterprise"]

[Text] Whether the restructuring will become a deep socioeconomic and political transformation or amount simply to another superficial staff reorganization will depend mainly on how significantly the position of the enterprise in the economic mechanism changes. By economic mechanism we mean the regulatory subsystem of the economic system that includes state management of the national economy, production self-management of the enterprises, and, partially, random regulation of economic relations.

Why is the objective need for restructuring paving its way accompanied by losses in the rates and scale of production? In our opinion, this is explained by the negative aspect of the "human factor": the inadequate business and psychological preparation of the management staff for modern methods of management and the temporarily not altogether favorable alignment of the forces of "reformers," "semireformers," "semiconservatives," and "conservatives" in this apparatus. And there is also the inadequate degree of theoretical clarity in the question of the economic and legal foundations of the new economic mechanism. Therefore the discussion of these foundations and the formation of a theoretical economic-legal model of the position of the enterprise in this economic mechanism remains crucial even after the adoption of the Law on the State Enterprise.

Basic Features of the Existing Mechanism and Its Sources

What is meant by the old position of the enterprise? From what should one proceed when rejecting one thing and preserving something else in order to create something new? Let us turn to the 1930's when a different economic mechanism was formed to replace the one that existed under the NEP. The NEP was not only "new" (having replaced "military communism"), but it was also a normal economic policy. In this respect, in the words of V. I. Lenin, it was introduced "seriously and for a long

time." The main thing in the NEP was not the private entrepreneur of the NEP period and not even the tax in kind on foods, but cost accounting in conjunction with state planning.

Theoretically the NEP could, by gradually changing, provide for the construction of complete socialism and function in the stage of its maturity. But history had something else in mind. The concrete conditions, and above all the imminent threat of military aggression from imperialism, forced us to abandon this normal economic policy and replace it with an emergency policy. One can argue as to whether the emergency policy was historically necessary or was arbitrarily imposed on the country by the political leadership of the time. Regardless of where this discussion might lead, it remains an indisputable fact that the emergency economic policy replaced the NEP and within its framework was formed an economic mechanism which during the 1930's-1940's completely fulfilled its historic purpose (at a high price, unfortunately) and provided for the survival and strengthening of socialism in the USSR and contributed to the formation of the world socialist system.

During the 1950's there arose an objective need to replace the second (after "military communism") emergency policy with a second (after the NEP) normal economic policy. The need for this sharp about-face was recognized in the economic discussions at the beginning of the 1950's. But 3 decades passed and this historical problem was still never resolved. Moreover, it is only now being raised seriously under the name of restructuring. Two generations of political leaders were unable to rise to the level of this problem and left their successors a legacy encumbered by debts. Thirty years of ignoring the objective laws of development cost the society dearly and formed a powerful inert system of social relations and social forces behind them. It is considerably more difficult to change these now than it would have been in the past.

In our opinion, the postwar economic mechanism, especially in the 1970's and the first half of the 1980's, corresponds in its basic features to the economic mechanism of the 1930's-1940's, but, unfortunately, it has lost its systematic character and along with it its effectiveness as well. The current economic mechanism has been transformed into an internally uncoordinated, disintegrated facsimile of the mechanism of the emergency period of development.

The changes made in it during the past 30 years can by no means be compared with those that took place during the process of the development of the socialist mode of production. First and foremost, two fundamental changes have not been properly taken into account: the quantum leap in the level of qualifications and the cultural-educational characteristics of the workers, and the predictable change in the motives for their economic behavior. We are speaking about the change from self-sacrifice in labor and the minimal demands on the level

and differentiation of consumption that are typical of emergency conditions in the direction of a greater share of material interests and persistent demands for consistent realization of the principle of fair socialist distribution of material and spiritual goods—according to labor.

Thus the economic mechanism remained unadapted not only to these deep and complex changes, but also to the relatively simple and obvious ones—the geometrical growth of the scale of the economy and its intensification on the basis of the achievements of scientific and technical progress. Both preclude the possibility of rational management with extreme centralization and strict limitation of the initiative and creativity of those being managed.

The stability of socialism and the consolidation of USSR positions in the international arena were already ensured. This required labor, superhuman exertion of effort, mass mobility, and an understanding by the people of the need for a rigid, authoritarian political regime, which in principle under socialism cannot be eternal. Yet we were never able to part completely with many management methods that are natural for a “fortress under siege,” but under conditions when “the siege has been repulsed and the enemy thrown back” become incomprehensible, pointless, and unnecessary, and fetter the spiritual life and social activity of the citizens.

The immense creative potential of the socialist society was driven into the channel of efficient performance alone (which is always necessary but never adequate), and innovative ideas about paths of further development of socialism were suppressed instead of being supported. The semistagnant economic development gave rise to an uncreative atmosphere in social life. This atmosphere, in turn, contributed to the preservation of the outdated economic mechanism. Everything was supposed to have begun with the economy, but this is not how it did begin, although, of course, something was accomplished.

Where was the adaptation of the economic mechanism to the principally new conditions of social development expressed on a large scale? Changes took place mainly in two directions. First—the application of coercive measures became less harsh and more limited. This correct line of development in and of itself could not produce a major change. It had to be combined with a positive program. In general this was understood. The second direction was that positive changes were made in the economic mechanism. Their general nature was understood correctly: what was needed was not a one-sided realization of the principle of democratic centralism, but a transformation—not a weakening, but a transformation—of the centralist basis and a strengthening of the democratic basis as well as an expansion of the rights of the enterprises.

But no satisfactory concrete solution has been found to this dual, dialectically contradictory problem during the past 30 years. This is one of the saddest dramas in the

history of socialism. This is why the experience of the failures that accompanied the search for such a solution is so valuable. If we do not interpret this and continue in the same spirit, the drawn-out drama of socialism could turn into a tragedy.

In our opinion, the most significant thing about the experience of the unsuccessful searches for a new economic mechanism is the attempt to construct it on the basis of directive planning. There was confidence (or at least the appearance thereof) in its unshakeability. Everything else was judged on the basis of this precondition. As a result, the economic mechanism that had taken form by the middle of the 1980's was not without logic—not so much socioeconomic logic or the logic of interaction of interests as command logic (orders and execution), which was familiar and comprehensible to the management staff. But the economy is not taken into account by that kind of logic!

The weakness of the current economic mechanism and its lack of correspondence to the times are not so obvious. Therefore the illusion still lives that it is not bad in itself, but it is the personnel who have not adequately mastered this mechanism and who are using it. Many are convinced that today as before everything is decided by personnel and not by the management system. But why did this system generate and develop unsuitable personnel? This question is not usually asked. Blame is placed on the random nature and on the fact that the wrong people were at the helm at one time. From this subjective-idealistic (although not unconvincing in everyday terms) judgment one draws the conclusion that it would be a good idea to try once again to prolong the life of the customary economic mechanism (having improved it, of course) and not enter on the difficult and risky path of its restructuring.

The best argument against such a position is to look the truth straight in the eyes and see the concealed weaknesses and failings of the outdated mechanism and, the main thing, to approach it with a strict criterion of revolutionary socialist practice. Is it sufficient to apologetically take advantage of the customary criterion—whether the economic mechanism provides for the achievement of success in comparison to the past? There is success of sorts even with semistagnant development. Today's level, naturally, is higher than it has ever been in the past. This is good, but it is not enough. It is time to proceed from a different criterion, one which is worthy of a great socialist power: Do the successes that have been achieved correspond to the nature and potential of socialism and is the existing economic mechanism capable of providing for our historically predictable superiority over developed capitalist countries and leading positions in the world economy?

We repeat that today's economic mechanism is an eroded facsimile of the mechanism that existed under the emergency conditions of development. Both—the prototype and the facsimile—are based on directive state

planning and the apportionment of planning assignments to the enterprises ("industrial apportionment"). But today directive planning has been greatly weakened. Actually, it no longer satisfactorily and reliably fulfills integrating functions and is incapable of opposing the disorganizing force of departmental narrowness, the antinatural dominance of the producer over the consumer, or the abuse of formal indicators. Departments (especially "cost-accounting" ones) do not so much control enterprises as grow together with them and give them protection in gaining group advantage at the expense of the society.

The outdated economic mechanism and the unsatisfactory system of management of the national economy gave rise to a multitude of economic anomalies. Among them is the lack of proportionality and balance in the production of interrelated products; the structural distortions in the production apparatus to the detriment of the branches that predetermine technical progress and the rapid "nonevolutionary" growth of labor productivity; the chronic shortage of one product along with the overproduction of another; the incompleteness, inefficiency, and unreliability of material and technical supply; the rapid growth of above-normative supplies of commodity and material values and the freezing of these; the conversion to in-kind production to compensate for shortcomings in supply and the underutilization of the advantages of specialization; a significant underloading of equipment; uneconomical expenditure of material and financial resources, unjustified new construction, and "prolongation of construction"; prolonged assimilation of new capacities and late installation of equipment; extravagant, frequently rapacious exploitation of natural resources; poor quality of a large proportion of the products of many branches, which is "compensated for" by growth of production volumes; the lack of substantiation and lack of balance of many wholesale and retail prices; account padding and other kinds of falsification of primary reporting, hence the unreliability of statistical data; slowness and backwardness of assortment; technical conservatism—slow introduction for show only or else blatant nonintroduction of scientific and technical achievements; the unfavorable structure of foreign trade (the prevalence in exports of raw materials and semimanufactured products as in poorly developed countries, and in imports—manufactured items which we could produce more advantageously for ourselves); poor differentiation in wages, equalizing at the level of the enterprises and workers, and, as a result, undermining of labor morale and dependency; a largely artificial shortage of labor resources and personnel turnover; and mass thefts in production.

Behind each of these manifestations of stupendous, unrestrained mismanagement are losses of many billions in the form direct losses and lost advantage. In general we are speaking about damage comparable to the amount of the national income. Because of mismanagement we lag behind developed capitalist countries by a

factor of 2-3 in terms of the level of labor productivity. As sociological research shows, "barely one-third of all workers are working at their full capacity."¹ It is difficult to measure the moral and psychological harm, but it is obvious. Only the great vital force of socialism can save our country from a general crisis. This is what we have come to! This is the account which the people and the party can and should submit to the outdated economic mechanism and to proponents of its "improvement," which actually amounts to its preservation.

A Step Forward

The June (1987) Plenum of the CPSU Central Committee raised and resolved questions of radical reform of economic management in a more systematic and concrete way than it has been done previously. There is no need either to exaggerate or to underrate the role of its decisions. As M. S. Gorbachev said at the Plenum, "they provide fundamental reference points for restructuring the economy. Of course, a good deal is also suggested by practical experience. Life will deepen our ideas about restructuring. There are new problems and considerable difficulties awaiting us. We are not insured against mistakes. . ." That is, the changes that are taking place are only a particular stage in a lengthy and complex process.

The restructuring will not go beyond the initial stage even with the adoption of the Law on the State Enterprise (Association). From the standpoint of the prospects of the Soviet economy it is rash and dangerous not to see the contradictory, indeterminate, and intermediate nature of the legislative decision that have been adopted. They are the result of a temporary compromise between the radical and conservative approaches, between the initiators of radical reform and the inert, bureaucratized management apparatus who are resorting to "perestroika-like" phraseology to mask their conservative positions and proposals.

The Law on the Enterprise proclaims and reinforces principles and elements of the organization of socialist management that are new or are understood in a new way. These include the definition of the enterprise as a socialist commodity producer; the utilization of the labor collective "as the master" of national property, with a separate part "in possession of" the enterprise; the priority of the consumer in economic relations; consistent distribution according to labor at the level of the enterprises and, in connection with this, economic competition of enterprises in the field of satisfying concrete social needs; complete cost accounting, distribution of income between the society and the enterprise according to economically substantiated normatives; the limitation of the monopoly and the subversion of attempts to abuse it; extensive self-management of labor resources; the right of the enterprises to make any decision that does not violate legislation on their own initiative, without any special permission ("everything is allowed that is not

forbidden"); the acquisition by the enterprise of materials (including means of production) through direct ties and wholesale trade; the application of contractual prices; independence in the establishment of cooperative and integrated ties with other enterprises; and independence of enterprises in foreign economic activity.

All these points are extremely important. But their practical significance is reduced by the fact that in many cases they are not expressed concretely enough. More than half of the law consists of theoretical discussions, wishes, appeals, and indefinite prescriptions, and its "words" far from always correspond to "deeds"—legal norms. Many of the norms essentially preserve elements of the outdated economic mechanism and block radical changes made in it.

This pertains first and foremost to the planning system. The law is supposed to depart from directive planning. It is in Article 10.3 that control figures are "not of a directive nature, should not tie the hands of the labor collective in developing the plan, and should leave it a good deal of room for selecting decisions and partners when concluding economic agreements." It would seem that control figures merely provide orientation for the enterprise in the economic situation. But according to Article 9.1, control figures are "established" for the enterprise by the higher agency and the enterprise is "notified" of them. It is more than likely that, depending on the enterprise's reaction to the control figures, the higher agency will make decisions that are favorable or unfavorable for the enterprise concerning economic norms, centrally funded material and technical supply (this "card system" will not soon give up its predominant position to wholesale trade), the remaining, as follows from Article 15.3 "serfdom"—the system of assigning consumers to suppliers, and the approval or nonapproval of an elected enterprise leader for his position. In a word, the enterprises have "nowhere to turn" and will accept the control figures that have been submitted to them just as they accepted the compulsory planned assignments before the law was adopted. One can be sure that the apparatus that developed and informed the enterprise of the control figures will "not stand for" its work, which justifies its very existence, to "be in vain," even if these control figures are economically absurd. The "replacement" of mandatory planning assignments with formally nonobligatory, but actually obligatory control figures is perceived as a changeover from forthright to shamefaced directive planning. To be sure, this is a somewhat limited framework, since the control figures are submitted to the enterprise once every 5 years, and the annual plans "are developed and approved by the enterprise independently, on the basis of the five-year plan and economic agreements that have been concluded"; and control figures include a significantly smaller number of indicators than were contained in the plan.

Or take another innovation—the state order that is "submitted" to the enterprise. It is a step forward that the order is issued not for all products (as was the case in

the plan), but for the part necessary primarily for solving state and social problems, the fulfillment of scientific and technical programs, the strengthening of the countries defense capability and economic independence, the delivery of agricultural products, and the startup of production capacities and objects of the social sphere through centralized state capital investments. Moreover, when issuing state orders "it is necessary to envision the mutual responsibility of the parties—the performer of the work and the client," even though, true, the parties are not equal. The enterprise cannot refuse state orders that are economically disadvantageous for it; according to Article 10.3 they are "obligatory for inclusion in the plan," which is developed "independently" and approved by the enterprise. Such is the moderate independence for the enterprise. So far we are not reaching very far into the declared changeover from mainly administrative to mainly economic methods of management.

In addition to changes in the planning system, this changeover requires well arranged cost accounting relations "along the horizontal and the vertical." The basis of these is the legal recognition of economic competition among enterprises and their socialist labor rivalry. In unity with friendly cooperation, it includes an internal motive force of socialist production. The greater the space given to objective laws of commodity and monetary relations, the more completely and consistently it operates.

Under socialism only commodity-monetary relations provide reliably enough for an equivalent exchange between enterprises under conditions of division and cooperation of public labor. Distribution according to labor is impossible without this kind of exchange. It is time to recognize that in the foreseeable future we can see no other mechanism which could guarantee equivalence of exchange. State management is not adapted for this function and it does not have adequate means for carrying it out.

At one time, under emergency conditions, the state took over the distributive function, certainly not in order to provide for equivalent exchange and thus distribution according to labor, but for opposing goals for which it was actually adapted. Then (and now too, only on a different scale) through authoritative prescriptions the state has provided the necessary nonequivalence of exchange in order to satisfy nationwide interests. Equivalent exchange and commercial-monetary relations were pushed into the background in order to drive funds out of agriculture and into industry, and within industry—from light to heavy, from civilian to defense. As a result it turned out to be possible to have only incomplete, accounting-registration cost accounting, which had at best a resource-saving effect.

This is no longer enough. There must be room for economic competition. It must be actually economic and not take place in the sphere of complicated account

padding or the achievement of reduced plans, increased prices, and resources that are in short supply through buttering up the superiors, to whom certain enterprises today owe their "percentage" successes. This means that it is necessary to have an arbitrator who objectively and dispassionately sums up the results of economic competition. This could be simply the socialist market, which fulfills this task the better, the less the state intervenes in its functioning, in the honest competitive struggle of the enterprises.

By proclaiming and forming complete cost accounting the state thus limits its own distributive function to a necessary minimum and relies mainly on the controlling mechanism of economic self-regulation. This is in principle. But the matter is complicated when changing over from the old economic mechanism to the new one. The old economic mechanism, which deliberately violates the equivalence of exchange through the price policy, has led to a general and deep disorganization of the price system. Now it will be necessary to form an economically substantiated system. Without it complete cost accounting, economic competition, and socialist rivalry can undeservedly and unfairly raise up certain enterprises while bringing others to the verge of bankruptcy. This danger must be recognized, although it is clear that during the transitional period certain limitations on complete cost accounting are inevitable, and they have been envisioned in the Law on the Enterprise.

In keeping with Articles 3.1 and 14.4, the wage fund is formed both according to the residual principle (which is natural for real complete cost accounting) and according to the normative principle, that is, at the discretion of the higher agency. It is assumed that the state will extend the former or the latter variant to the branches and enterprises taking into account various economic conditions for their activity. If one is faced with doubtful prices, a monopolistic position, shortages, or other factors that preclude honest competition, the normative principle is applied. Here the normative determined for the enterprise for forming the wage fund will be not so much based on reports of normal branch profitability and rent adjustments as (and one should not close one's eyes to this) it will simply be driven up to an "adequate" wage level. Distribution according to the results of economic competition will give way to the customary distribution "from above" and "complete" cost accounting will be transformed into a makeweight for this kind of distribution.

Shamefacedly retaining the directive nature of planning and the extremely conventional, if not fictive, completeness of cost accounting, in our view, are the basic shortcomings of the Law on the Enterprise. They require explanation. Like any compromise decision, the law reflected the alignment of forces of proponents of reform and its opponents and the measure of partial and temporary coincidence of their interests and goals. There is no doubt that for a radical reform it is preferable for the law immediately to reinforce the final goal of the new

economic mechanism. But in the existing situation it is also possible to be satisfied with an intermediate model as long as it meets the conditions of the transitional period and helps to overcome what the June (1987) Plenum of the CPSU Central Committee called "pre-crisis forms." Of course, this content makes the law short-term. But this is even more of a basis for creating in time a truly stable law, and a better one from the standpoint of juridical technique.

The shamefaced directiveness of planning and the "limited-complete" cost accounting mean largely the maintenance of administrative methods of management and thus the existing bureaucratized management apparatus—the main bearer of conservative tendencies. This is the most dangerous element of the compromise. Let us recall, however, that in their day the Bolsheviks resorted even to such a compromise as the Brest Peace, and their confidence in the idea that it would be overturned by the development of events was justified.

It would also be possible to have a better law concerning the enterprise, but let us be realistic: The law has already been adopted. Its practical application will take place in the struggle between the proponents of restructuring—mainly the labor collectives of the leading enterprises, their managers, and progressive workers of the administrative staff—and their opponents. The general principles reinforced in the law and certain concrete strides or at least movements in the direction of the new, optimal economic mechanism give proponents of restructuring a support which they did not have previously in their struggle for reform. Therefore the law has been a step forward in our development. It does not guarantee us against the restoration of the old economic mechanism, but it reduces the probability and lays the basis for the next steps, including the formation of a new system of planning and cost accounting relations that correspond to it.

Toward a New System of Planning

Which relations will have to be properly regulated? They are relations between the state and enterprises regarding the planning of their activity and relations associated with the realization of cost accounting. The former predetermine the latter. It is not without reason that the planning system is called the heart of administration.

Our bitter experience with semistagnant development in the 1930's, including correct but, unfortunately, half-way measures like the "semireform" of 1965, the multitude of not very productive individual measures, and also the fruitful experience of the socialist countries make it possible to assert that the preferred form of state planning of the activity of the enterprises should be not directive planning, but directing, indirect, and regulative planning.

What is its essence? Let us look at it from the standpoint of the enterprises.

The state determines the levels of production of various products, the basic directions for the development of production, and its progressive structural changes, it informs the economic administration agencies of the corresponding assignments, and it allots them the appropriate material and financial resources. The administrative agencies do not pass out the assignments that have been sent down from above to the various enterprises, but simply orient them, stimulating the production of the products that are to be given priority in keeping with the economic conditions that have developed for the planning period.

The enterprises independently develop and adopt plans for their activity (basic and supporting, profile and nonprofile, but technologically and economically advantageous). These plans are based on the portfolio of orders, particularly those concluded with state agencies on an equal-rights basis. The higher agencies conclude contracts with the enterprises that determine the directions and conditions for state stimulation of output that is included in the category of priority for the given planning period. These contracts pertain to the allotment of funded materials and equipment, subsidies for capital construction or reconstruction of production, credit, and so forth. Thus a plan is formed which meets social needs. It is registered by the higher agency. The registration is not an approval. A rejection of registration does not abolish the plan but merely withholds state support from the enterprise that insists on the correctness of its plan.

Now let us take a look at the essence of regulative planning from the standpoint of the state. Is regulative planning not weak, flawed, and "nonplan"? In our view it is not. The inadequate information and sometimes also speculation on misinformation are shown by the denial of the effectiveness and the very possibility of regulative planning as state authorized determination of the parameters and prospects for production. The denial is based on the fact that these parameters and prospects are not prescribed directly and in an unmediated way from above to below but are achieved in the final analysis through the economic mechanism which is regulated by the state, which includes "shady" and random aspects that cannot be eliminated from economic life (and therefore this form can be called regulative, although other names are also possible).

Centralized state regulative planning has certain advantages over directive planning. In the first place, regulative planning has a healthy information base—generalized data about preplanning agreements between enterprises which reflect both the social needs—sum of orders—and production capabilities—accepted orders, rejections, and unutilized capacities. Today, when the enterprises are interested in reduced planning assignments, this information is hopelessly distorted.

In the second place, the state is relieved of the necessity to control each and every thing. It knows where social needs are being satisfied even without intervention, as a

result of economic self-regulation. And this means that it is possible to concentrate its efforts on those areas that actually cannot do without intervention.

In the third place, having a better sense of the objective nature of economic processes and having less temptation for economic arbitrariness, the state can calculate more precisely the directions and methods of its influence on production. In certain cases this means credit, which provides for the best utilization and renewal of production capacities, and in others it is the creation of new capacities that are oriented toward revolutionary changes in production and quantum leaps in labor productivity. It is in the investment policy and the formation of new enterprises and entire branches that the state plays an unquestionably leading role since it can mobilize the immense resources that are concentrated in its hands.

Consequently, the strategic role of the state in economic development is completely ensured by regulative planning as well. To be sure, in a different way than with directive planning, but that is another question. The state utilizes directive planning under extreme conditions in order to subordinate (to the extent that this is generally possible) production to the laws of the political struggle and the achievement of political goals that are typical for the given conditions. B. I. Lenin's well-known thesis concerning the primacy of politics over economics is realized. With this approach the state intervenes in the economic process (to the extent that this is possible without violating its laws) powerfully and sharply, in some ways breaking and bending it, authoritarily directing production through planning assignments that are subject to unconditional fulfillment. This does not mean the abolition of economic laws, but their effect is limited; it is as though they are relegated to secondary importance.

When applying regulative planning the state smoothly enters in to the economic process, relies on its laws, constructs an economic policy in keeping with the utilization of these laws, and, consequently, subjects it to them. By sharing the burden and privilege of planning with the enterprises it not only does not forfeit its own strategic role, but, on the contrary, fulfills it best under normal, nonemergency conditions. Perhaps the only ones who cannot see this are those who long for the difficult but heroic times of the past and close their eyes to the fact that all that is left of the former effectiveness of directive planning are the external effects.

How does one ensure the adoption of the most demanding plans? Directive planning simply puts pressure on the enterprise. Regulative planning creates which themselves unquestionably force the collectives to adopt demanding but still realistic plans, since their well-being depends entirely on this and not on the percentage of fulfillment of planned assignments. Regulative planning is capable of excluding work for "percentages" from economic life since there will be no point in selfish

manipulation of them. And if the economic conditions themselves motivate the enterprises to work hard and honestly, it is possible to apply to directive planning the words, somewhat altered, of the character from the serial "Experts are Conducting the Investigation": "Why in the hell do we have this pressure! . . . It is possible to concentrate on organizing fruitful cooperation between the state and the enterprises in the normal planning process."

The principal advantage of regulative planning over directive planning consists in its democratic nature. This is good not merely from a political or ideological standpoint; it is also economically useful. The subjects of planning (the state and the enterprises), by cooperating, reveal the advantages of their position and get rid of their weaknesses. How? The state apparatus, if it corresponds to its purpose and does its business, is constantly studying the general and future social needs, predicting their dynamics. And the enterprise is closer to the detailed current needs of specific consumers—its clients. Each subject of planning makes decisions in the areas about which it has the more information and is thus stronger. And it places where it is weaker it limits itself to an expression of its opinion, which is, to be sure, not without normative content. That is, each has advantages in places where it is capable of doing the common work better than the other can. At the same time the state, by virtue of nature of the problems it resolves and by virtue of its right to dispose of considerable resources, plays a leading role in this cooperation and determines the strategy of development. In our opinion, its purpose consists precisely in this, and not in a demonstration of its "ability to direct."

Regulative planning is organic to socialism, and on the whole it is incomparably more effective than directive in terms of economics. In the social sense this form provides better than any other for a high level of social activity of the workers and their creative participation in the management of the enterprise and the affairs of the society as a whole. Regulative planning as the primary (but not the only) form of state planning is inseparable from the development of socialist democracy and socialist self-management. Without it these concepts become meaningless declarations and lose their viability.

Does this mean that it is necessary to reject directive planning altogether? Obviously not. It is typical of emergency conditions, but it can also have advantages over regulative planning under normal conditions. The branches of the economy are distinguished from one another as objects of planning. Our problem of many years has been that we do not give consideration to this objective law. And even when we do recognize it, we try to "take into account" branch differences in an eclectic way, squeezing into objective planning corrections and additions that contradict its nature and cause its disintegration. As a result, we have an amorphous "universal" form of planning which does not satisfy the needs of the

national economy and does not organize it so much as it disorganizes it. It is kept afloat only because it sounds good and it "gives work" to the management apparatus.

The goal of the state—the organization of the economy as a unified whole and the satisfaction of the general and future interests of the society—with respect to the majority of branches a, in our view, can best be achieved on the basis of regulative planning, and with respect to a few branches—on the basis of directive planning. That is, we are speaking about partially retaining directive planning. This should be regarded as a necessity and not a virtue: directive planning should be rejected if possible or tolerated if necessary.

It appears that under today's international and production conditions it would be premature and irresponsible to refrain from directive planning in the defense industry, the fuel and energy industry, or in transportation. Why these branches in particular? In them it is still practically impossible to escape from the monopolistic position of the producers. And this means that it is dangerous to give them extensive planning independence and allow them into the "garden" of cost accounting, where they will inevitably take advantage of their position. Moreover, these branches, in the interests of the economy as a whole, must develop with guaranteed stability and at more rapid rates. The state can provide for this by effectively maneuvering resources and making necessary expenditures. Nor can one fail to take into account the fact that in these branches it is necessary to have production discipline (essentially semimilitary) that is unified on the scale of the country. This can be provided more simply with the help of directive planning. A predictable question: who will want to work in this branches, which clearly lose out to those that have changed over to complete cost accounting? People will be found if they are provided with significant material and social compensations.

When speaking about partially retaining directive planning, we have in mind not the current weak, eroded directive planning, which has become one of the major reasons for the economic anomalies and the semistagnant development, but real, viable directive planning, whereby all directives (planning assignments) are reasonable and economically substantiated, and their unwavering fulfillment is ensured by sufficiently precise measurement of the real results of the collective's activity. For a limited sector of the economy the state is quite capable of setting up precisely this kind of directive planning.

In industry, which produces complex products that are not adequately measured with today's formal indicators, the effectiveness of directive planning is provided by strict consumer control. If the client is keenly interested in flawless quality of the products that are produced for him and his permanent representative in the supplier enterprise is constantly checking on the entire production process (from intake to output control and testing)

for quality, this makes it possible to make sure that the gross output and all other indicators are "honest." It is practically impossible to organize this kind of control in all branches. State acceptance of products, which has now been introduced, with all its positive significance, is still not able to replace consumer control.

The effectiveness of directive planning in the fuel-energy industry and in transportation is provided by the fact that their final product is relatively simple in terms of qualitative characteristics and is adequately reflected by formal indicators.

For completeness of the planning system and expansion of the possibilities of maneuvering, it would apparently be expedient to augment regulative and directive planning with one more form—limited directive planning. Its essence lies in the fact that plans made independently by the enterprises are not registered as with regulative planning, but are approved by the higher agency. This procedure makes it more like directive planning. Its distinction is that the enterprise draws up plans not according to an apportionment, but on the basis of a portfolio of orders. Limited directive planning could be utilized well as a temporary form (when conducting measures to improve enterprises that are operating poorly and functioning under the conditions of regulative planning) and as an intermediate form (when gradually changing branches and enterprises over from directive to regulative planning).

In our constructively critical time it is desirable for economic-legal recommendations to be given a normative form that is convenient for evaluation. The position of the enterprise in the new planning system can be represented in this form.

1. In keeping with the principle of democratic centralism, the enterprise is granted planning independence, making it possible to account concretely for economic market conditions and show initiative and enterprisingness in satisfying the interests of the consumers. This independence is limited by the state within boundaries necessary for priority satisfaction of nationwide interests.

Depending on the branch's affiliation and other conditions, the enterprise functions under general (regulative), temporary (limited directive), or special (directive) conditions of centralized state planning.

2. An enterprise operating in keeping with legislation under general conditions of state planning independently develops and approves the plans for its activity. State agencies do not establish mandatory planning assignments for it. The plans are based on orders from consumers and decisions of state agencies concerning concrete measures for stimulating the production of priority products.

At the beginning of the planning process, on the basis of a portfolio of orders, the enterprise draws up preliminary drafts of five-year and annual plans and a survey of unaccepted orders (with an indication of the reasons) and a preliminary reference concerning unloaded capacities. It submits these documents to the higher agency by a legislatively established deadline so that the existing economic situation can be generalized and taken into account when developing the five-year and annual plans for the economic and social development of the USSR.

Having received from the higher agency within the established time period information concerning the possibility and conditions for planned state stimulation of the production of a particular product, the enterprise concludes agreements independently: with the clients—state agencies, enterprises, institutions, and citizens—concerning economic and other conditions for the fulfillment of their orders; and with the higher agency, concerning tax breaks, subsidies, credit, supply of stored materials, or other economically justified assistance rendered in keeping with the state plan to the enterprise in connection with its production of priority products. Products that are not in the priority category are produced by the enterprise without state assistance.

On the basis of the agreements that are concluded, the enterprise draws up and adopts five-year and annual plans for its activity and submits them to the higher agency for registration by the established deadline. Appended to the plans are surveys of unaccepted orders with an indication of the reasons for the nonacceptance, a reference concerning unloaded capacities, and also (with the agreement of the higher agency) a list or copies of agreements that have been concluded with consumers.

If the higher agency refuses to register the plan because of its orientation toward the production of outdated products, the application of outdated technology, the distance of shipments, or other reasons, the enterprise either corrects the plan and makes changes in the agreements or it notifies the higher agency of the considerations that led it to fulfill this plan at its own risk without turning to the state for assistance if the consequences are unfavorable.

3. By a decision of the higher agency, which is approved under the policy of jurisdiction and can be disputed in the State Arbitration Board, the enterprise can temporarily (for a period of no more than 2 years) be changed over to conditions of state planning, which are similar to general conditions, but the registration of a plan adopted independently by the enterprise is replaced by a procedure whereby it is approved by the higher agency.

The enterprise is under temporary (limited directive) conditions of state planning in the following instances: in the initial period of its activity; if the enterprise is operating at a loss or has seriously violated legislation, causing the higher agency to conduct measures from

improvement, taking over direct management of its activity; when the enterprise is gradually being changed over from special to general (regulative) planning conditions.

4. At the request of the USSR Council of Ministers, the USSR Supreme Soviet or its Presidium, if necessary, extends state planning conditions to individual branches when the higher agency establishes mandatory planning assignments for the enterprises and determines the basic conditions for the delivery of products to the consumers. The decision to extend special planning conditions to the branch includes the indicators by which the fulfillment of mandatory planning assignments is evaluated and the forms of direct control on the part of the consumer and the state over the assortment and quality of the products.

An enterprise functioning under special conditions of state planning submits to the higher agency by the established deadlines its planning proposals, which take into account the direct ties that have been formed with the suppliers and consumers; on the basis of mandatory planning assignments it develops a plan for its activity; after the plan is approved by the higher agency, the enterprise concludes economic agreements that correspond to it.

The Measure of Cost Accounting

Legislative reinforcement of cost accounting principles and concrete norms providing for their realization are of exceptional importance. The soil has already been prepared for this. We have extensive normative material and scientific literature in which all the essential features are either reflected directly or, out of considerations inherited from the emergency period of development, are avoided (but it is clear precisely what is being avoided). It is time to generalize on a new normative level all the achievements of economic and legal thought in this most important sphere.

The essence of cost accounting in the activity of enterprises, in our opinion, is reflected fairly completely by the following principles.

The well-being of the labor collective is based exclusively on efficient utilization of property that has been turned over to it or has already been in its possession, on thriftiness, on economic initiative, on enterprisingness, and on substantiated economic risk.

With conscientious work and efficient self-organization, the economic conditions provide the enterprise with income sufficient to satisfy the reasonable needs of the workers and to develop production on the basis of self-support and self-financing.

A portion of the enterprise's income, established taking social needs and economic conditions into account, goes to the state to satisfy social needs.

Economic relations among enterprises are based on equivalent exchange in commodity-monetary form. They voluntarily help one another without compensation in the event of natural disasters, emergencies, unexpected changes in market conditions, and so forth.

In the management of the enterprises, the state, in addition to economically substantiated unilateral, authoritative decisions, makes maximum possible use of economic methods that are reflected in commodity-monetary relations of the state agencies and enterprises. The enterprise can turn to the state for assistance (with credit or subsidies) during reconstruction or expansion of production or other socially necessary work for which the expenditures exceed its own capabilities.

Cost accounting relations among enterprises and between them and state agencies are regulated by economic agreements in which all parties have equal rights.

The differences in the levels of remuneration for the workers of various enterprises depend exclusively on the quantity, quality, and organization of labor (the labor basis of differentiation of the well-being of various labor collectives). This is ensured by the fact that the state evaluates economic conditions at enterprises and, in order to equalize them, it partially redistributes the income they receive.

An enterprise is not allowed to monopolize the production and sales of a particular product on the scale of the country or the region. And if a monopolistic situation develops, the state limits the independence of the enterprise in planning and price setting and begins to monitor its activity closely.

The enterprise bears full responsibility for its economic mistakes and omissions and makes complete reimbursement for damages (including missed advantage) caused to the society, other enterprises, or citizens by improper performance of its duties.

The new position of the enterprise must include clearcut and specific norms and procedures that regulate: the contractual form for transferring national property to the enterprise for economic possession (the rights of the possessor do not coincide with the rights of the owner, but are close to them); constant investigative accounting for changes in the physical composition and value of this property; conditions for the utilization of natural resources, including payment for them, restoration of renewable resources, and ecological requirements; the policy for making reimbursement and increasing the value of fixed capital turned over to the enterprise (perhaps the optimal form of this reimbursement are amortization deductions that are made during the period when the capital is becoming obsolete. If there are no special state restrictions, the enterprise could at its own discretion use them for technological renewal and reconstruction of production); the policy for the formation and utilization of the fund for the development of

production; the determination of the proportion of the enterprise's income deducted into the state budget; with the help of rent or similar payments, equalization of the economic conditions for the functioning of various enterprises; the residual principle for the formation of the fund for remuneration for labor; a combination of state firm and limit prices (putting a stop to the current "expenditure self-will" in price setting); consumer control of product quality, including in the production process; the functioning (as an exception) of normatively less profitable enterprises in order to solve social problems; the creation of joint productions by the enterprises on a cost accounting basis; and the realization of cost accounting in foreign economic ties.

Of principal significance is the completeness of cost accounting and its connection to the planning conditions under which the enterprise is functioning. It has now become fashionable to speak about complete cost accounting. All real cost accounting must necessarily be complete. Complete cost accounting is actually of great significance for solving such ancient and difficult problems as increasing labor productivity, improving product quality, changing over to the latest technology, economizing on resources, and providing for contractual and labor discipline. But this cannot be accomplished by declarations and incantations. In our opinion, the introduction of regulative planning as the leading, preferential form of planning opens up the way to an actual changeover of a large part of the enterprises to complete cost accounting. With directive planning and also, with certain reservations, with limited directive planning, incomplete cost accounting is possible and useful, but attempts to form a likeness of complete cost accounting cause harm. Why?

Complete cost accounting presupposes sufficient completeness not only of obligations, but also of rights. When it is characterized by the concepts of "self-support and self-financing" one has in mind mainly the duties and nothing is said about the rights. One cannot be satisfied with this truncated formula for cost accounting. As a minimum it is necessary to have the formula "self-planning, self-support, self-financing." Unless the enterprise is granted the right to self-planning it cannot be held responsible for the full load of duties of self-support and self-financing. And if one is to be precise one should speak not about the right to self-planning but about the right to self-management (self-planning is an element of it—a key one but not the only one). We are speaking about self-management in the relative sense since state management of the economy as a unified whole remains supreme. This management is reflected in state planning (in this case, regulative), legislation, state control, and the investment, structural, resource, financial, and personnel policy, in a word, in the entire mechanism of the economic policy. Taking this into account, one can also say that cost accounting means self-management, self-support, and self-financing. And if one may compress and refine this formula, then cost accounting is the economic side of self-management of enterprises under conditions of labor emulation and socialist competition.

With complete cost accounting, the well-being of the labor collective and its acquisitions and losses depend entirely on the final economic results of its socially useful activity. But it will not be possible to place the enterprise in this strict dependency (without it, it is not complete cost accounting) unless it is given freedom as a basic prerequisite for its economic activity—in planning and answering the questions: what will be produced under what conditions, and how will they provide for sales? And if such questions are answered by the state, leaving the enterprises with merely the role of consultant, then the state will take economic responsibility for the consequences of its actions. That is the whole thing. With incomplete, minimal self-management it is impossible to have complete cost accounting!

The imitation of complete cost accounting of enterprises functioning under conditions of the current weakened, largely disorganized directive planning should not be legalized, but eliminated. Because the enterprises have done an excellent job of learning to manipulate formal planning indicators in order to artificially increase the results of their labor (the production of "advantageous," that is, costly products, raising of prices, "repeated reporting," utilization of their monopolistic position in order to force the consumer to accept large quantities of poor-quality products, and so forth). In plain terms, this is the acquisition of unearned income and social parasitism, which demoralize the labor collectives, the management apparatus, and the workers. Expanding the independence of the enterprises without a radical change in these economic and organizational conditions essentially means inviting them to greater parasitism, taking advantage of the flaws of the economic mechanism.

It is necessary, consequently, to introduce, establish, and regulate complete cost accounting in places where it is applicable and to define the limits of incomplete cost accounting in places where it is useful and where complete cost accounting is impossible and threatens disorganization of production.

In normative form, continuing what was said above about the position of the enterprises in the planning system, it would be possible to express this thusly. Complete cost accounting is extended to an enterprise functioning under general (directive) conditions. The profit obtained by the enterprise, minus a proportion established by legislation and branch normatives, is left completely at its disposal and cannot be taken away by the higher or other state agencies out of considerations of economic expediency. The enterprise is completely responsible for incorrect or improper fulfillment of the plan. Cost accounting is extended with changes to enterprises operating under temporary or special conditions of state planning: responsibility for the negative consequences of an erroneous planning decision on the part of the higher agency, if it was fulfilled properly, shifts from the enterprise to this agency.

With differentiation of the forms of planning and the degrees of cost accounting it will be necessary to organically coordinate the organization of management at enterprises and in associations (not the current associations, which are not very different from enterprises, but real associations of enterprises as independent economic organizations that jointly carry out certain activity). Linked to regulative planning are developed forms of self-management, which include the decisive authority of the councils of labor collectives and the election of leaders as well as the formation of self-managed economic associations. The deliberative rights of labor collective councils, the appointment of managers from above (taking the opinions of the collectives into account), and the formation of state (directly controlled by the state) economic associations all correspond to directive planning.

Such, it seems to us, are the bases of the position of the enterprise in the new economic mechanism.

As the basic unit of the economic system the enterprise is at the focal point of production relations, which directly or indirectly determine all other social relations. The country's economic might and the level of satisfaction of the material and spiritual needs of the society as a whole, each of its members, and territorial communities depend on the operation of the enterprise. Real democratic organization of management at the enterprise makes it possible for the workers to create, develop, and freely realize their potentials. Democratic organization of production activity and socialist economic democracy in general are the best guarantee and the only possible basis for all-around development of political democracy, eradication of bureaucratic perversions in management, reduction and streamlining of the management apparatus, and the curbing of the inclinations of various groups and individuals to acquire and preserve various elite-caste privileges that are incompatible with socialism.

The solution to the majority of socioeconomic and political problems that are not so critical to the state, the party, and the people is in one way or another linked to improvement of the activity of the enterprises. Bringing this activity fully in line with the nature of modern productive forces is a task that has been placed at the center of state policy. The adoption of the Law on the State Enterprise and other recent directive documents is a most important step in the right direction. But searches for effective forms of management should also continue in the future.

Footnotes

1. T. I. Zaslavskaya, "The Human Factor in Economic Development and Social Justice," *KOMMUNIST*, No 13, 1986, p 63.

Association Director Discusses Quality Control 18200012b Novosibirsk *EKONOMIKA I ORGANIZATSIYA PROMYSHLENNOGO PROIZVODSTVA (EKO)* in Russian No 10, Oct 87 pp 93-98

[Article by V. K. Gupalov, general director of the Krasnoyarskiy Mashinostroitelnyy Zavod Association, Hero of Socialist Labor, honored machine builder of the USSR: "Our Work Motto—A New Refrigerator Every Two Years"; first three paragraphs EKO introduction]

[Text] In the rather variegated panorama of "eternal" economic problems which our national economy has been trying to resolve for many decades, there is one which affects literally every individual: this is the quality of products that are produced. So many attempts have been made to affect this! These include administrative measures for influencing the managers of enterprises and collectives, the introduction of certain material incentives—in the form of additional payments for quality, attempts to construct a comprehensive system for controlling it, and the creation of a new system for monitoring. Not a single one of these measures has produced a significant effect. Therefore the debates continue, and there is still an abundance of suggestions concerning the subject: how to improve quality?

This was the central problem at the regular meeting of the all-union directors' club sponsored by EKO and the Institute of Economics and Organization of Industrial Production of the Siberian Branch of the USSR Academy of Sciences, the seventh one of these meetings. It took place in the city of Aboyan in the Armenian SSR. Directors of industrial enterprises and scholars participated in its work. The meeting was led by Academician A. G. Aganbegyan. Managers of enterprises whose products are known for their high quality were present in Aboyan.

"How are you achieving this?" we asked them. And we received the following answers.

The Motto for Our Work Is a New Refrigerator Every Two Years

Our association has been producing Biryusa household refrigerators for almost 25 years and reconstruction has been taking place in the existing production for 23 years. I emphasize especially: the reconstruction has been carried out without halting production, and not only in order to increase output but, which is especially important, with a simultaneous changeover to new and better models, expansion of the assortment, and an increase in export deliveries. Significant changes have taken place as a result of the four radical reconstructions of existing production. In 1970 we manufactured 550,000 refrigerators of one model (with a capacity of 160 liters); there were no exports. In 1975 we manufactured 665,000 refrigerators of two models (capacities of 160 and 240

liters); exports amounted to 32,000. In 1980 we produced 720,600 refrigerators and freezers of five models with capacities of from 120 to 280 liters; and exports amounted to 83,000. Finally, in 1986 we manufactured 741 refrigerators and freezers of six models with capacities from 120 to 280 liters and 944,700 compressors for household refrigerators. The exports of refrigerators amounted 161,000.

As a result of the parallel creation, assimilation, and reconstruction of existing production, with the existing labor collective, the time periods for assimilating capacities and recouping expenditures are reduced considerably. Thus expenditures on conducting reconstruction and technical reequipment of production from 500,000 to 700,000 refrigerators a year amounted to 24.2 million rubles, the profit obtained as a result of the reconstruction of production was 132.2 million rubles, and expenditures were recouped in 1.2 years while the normative is 6.5 years.

But what caused the increased demand for our refrigerators and freezers? It seems to us that the main thing is the comprehensive approach to raising the technical level and the ability to compete, taking into account the experience of domestic plants and foreign firms that engage in the output of household refrigerators.

In the production of refrigerators we have created a special design division that is capable of doing independent developments and improving products. This division also has specialized laboratories for testing reliability and an experimental base. This has made it possible to conduct tests of the basic parameters of all the materials and batching items that are used and also to check each component and refrigerator as a whole for reliability and to achieve the required parameters.

In 1986 for the first time in the country an experimental production of small series was created for analogous plants. It produces the first batches of new models in order to study the demand in the country and abroad, and it also develops designs and technologies for their manufacture before they are put into mass production. This undoubtedly contributes to solving one of the major problems of our collective: "Every 2 years—a new model." We have created a special design division for mechanization and automation which has under its jurisdiction a shop for manufacturing nonstandard equipment, conveyors, and means of mechanization of production. In our opinion, now technical solutions for the initial conveyors, conveyance mechanisms, and manipulators for them as well as solutions for devices for loading refrigerators into containers and railroad cars are on an exceptionally high level. We have developed and are applying a management system that is analogous to the ones that exists at VAZes. Here we have centralized the technological service and the mechanics and energy engineering services. This has made it possible to solve

complicated technical problems on the spot and to utilize labor resources effectively, especially during the period of reconstruction of individual production sections.

The technical level and quality of our refrigerators and freezers are undoubtedly affected by their delivery for export, including to developed capitalist countries. Exporting raised the discipline and responsibility at the plant. When delivering refrigerators to countries that are legislators of style for this equipment in Europe (Italy, the FRG, England, and France), at the same time we receive information about all innovations in this area, which makes it possible to determine the future correctly. When introducing the latest achievements into refrigerators for export, at the same time we apply everything to the refrigerators for the domestic market. Now the assembly of both export products and those for the domestic market is done on a single conveyor according to a single technology. Refrigerators for export deliveries are distinguished only by individual batching items that take into account the specific requirements of the foreign consumers. Of course, the delivery of products for export to capitalist countries is not a simple matter and it has required a great deal of work from the plant's collective. Suffice it to say that in order to provide for deliveries of refrigerators to developed countries it was necessary to conduct tests and to certify the models in these countries. Our items were the first of all the domestic electric appliances to be given the right to be marked with national trademarks that certify that they fully meet the requirements and standards of the importing countries. The plant has fulfilled the ministry's assignment for developing exports, having delivered more than 161,000 refrigerators in 1986, and it is prepared to double its exports beginning in 1987. Deliveries of refrigerators for export have made it possible to receive foreign currency for purchasing progressive equipment and to deposit significant amounts into the material incentive fund (more than 4 million rubles since the beginning of the export deliveries).

We have been placed in difficult conditions in recent years: the market is beginning to be saturated with refrigerators (in our country the degree of saturation is 92 percent). Therefore industry, services, and trade must be especially efficient and take initiative when carrying out tasks and solving problems having to do with sales.

In the chain of "plant-sales-trade-consumer" the basic responsibility is borne by the manufacturer. Therefore we are looking for ways of establishing closer relations with trade organizations. We have introduced an extensive practice of delivery-sales in various cities of the country and sales by models in the base stores with pretrade preparation by enterprises of Rambyttekhnikha using the trade discount, with the delivery and installation of the refrigerators for the consumer. A company store is being constructed in Krasnoyarsk, where it is intended to carry out pretrade preparation, delivery of

the refrigerator to the consumer, installation, and subscriber service during the warranty period, as well as to study the demands for the new models.

We are showing exceptional interest in how our refrigerators are serviced among the population, especially if one takes into account that the population has about 13 million of them. Therefore the plant is introducing new forms of relations with consumer service enterprises. Thus in Moscow we have created a technical center for servicing Biryusa refrigerators, which we have equipped with modern equipment. Today, taking into account service experience abroad, we are introducing progressive forms of service: repair of the refrigerators in the home in a time that is convenient for the owner, and guaranteed quality of the repair. The wages for the mechanics are made dependent on the quality of the repair and not on the number of calls. It is intended to create similar centers in other regions of the country. At the plant we have created a shop for manufacturing spare parts and therefore neither the ministry's main administration nor the RSFSR Ministry of Consumer Services has had any complaints against the plant concerning their deliveries for many years.

Thus in our association we have created the largest production of Biryusa Household Refrigerators and freezers in the country. Today a refrigerator comes from the conveyor every 20 seconds and a compressor—every 12 seconds. And since it is the largest production, the responsibility of the collective and the managers to the state and the consumers should also be on the highest level. Of course, the collector is proud of the fact that our goods are in demand on the domestic and foreign markets. Suffice it to say that about 28 percent of our overall output of refrigerators in 1987 will be delivered for export for freely convertible currency, and the USSR Ministry of the Trade has ordered an additional 500,000 Biryusa refrigerators for 1987 while the production plan is for 745,000 units.

One of the most important issues for us has been to reduce the material-intensiveness and energy consumption of the items that we produce. In order to solve this problem the plant has developed and is preparing for output beginning next year refrigerators and freezers with a principally new design—a panel type, which makes it possible to reduce the expenditure of scarce cold rolled sheet steel by 20 percent. The plant has everything necessary for comprehensive testing of any model of refrigerator. Therefore, paying attention to the introduction of state receiving at the plant and the interest of the Ministry of Trade and the Ministry of Foreign Trade in the new items, we consider it necessary that we be granted the right to make the final decision concerning the delivery of new refrigerators for series production. Let representatives of the Ministry of Trade and the Ministry of Foreign Trade participate as well. Then the time periods for the delivery of the new model for production will be sharply reduced. But so far we

have a paradox. Our collective, as I have already said, is working according to the principle: "Every Two Years—A New Model." But the recently established GOST for the refrigerators and freezers of the parametric series was developed by the head organizations more than 5 years ago, and we do not think that it is appropriate for the future.

A decisive factor in reducing energy consumption is the changeover to a new and more economical model of compressor. A basic decision has now been made concerning the creation of capacities for producing it in four ministries that produce household refrigerators. The USSR Gosplan must accelerate the development and make a concrete decision regarding this issue.

We also have other problems related to providing for a high technical level of the products we produce. First and foremost, there is the supply of high-quality translucent colored plastics and electric steel strips. There are many problems in working production, but we are confident that our refrigerators will meet the requirements of the strictest world standards.

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Production Should Be Inspected for Quality Control

18200012c Novosibirsk EKONOMIKA I ORGANIZATSIYA PROMYSHLENNOGO PROIZVODSTVA (EKO) in Russian No 10, Oct 87 pp 99-104

[Article by E. A. Antonov, NPO deputy general director (Leningrad)]

[Text] "The readiness of production to produce high-quality products should be subjected to comprehensive quality control."

One is impressed by the scope of measures taken in the country for improving quality: we are developing a new product, reconstructing production, introducing new state standards and certification of product quality, we are creating a barrier of economic sanctions against the delivery of products that do not meet the requirements of standards and technical specifications, and we have introduced a new control agency—Gospriyenka. But are these measures enough? How effective will they be in the future, after they have put an end to the obvious (even overt) irresponsibility and have imposed order to the point of limited returns?

We are analyzing attentively GOST 15.000-82, "The System of Development and Delivery of Products to Production. (SRPP). General Provisions"—the basic document that regulates the technology for the organization of work for the creation and output of industrial products.

Point 2.2 of this important document points out that the state standards of the SRPP should contain the following groups: general provisions; scientific research work; experimental design and experimental technological work; production (delivery to production, unit, series, mass production); delivery (advertising and sales); operation; repair; support of operation and repair by industry; and removal from production.

Thus standards should exist for all of the most important stages of the "life cycle" of any item. What is the content with which these groups of standards are "filled"?

From the appendix to the GOST under consideration it follows that, basically, a group of "general provisions" is being developed. As concerns the degree of "filling" of the other groups, they contain five documents that pertain to individual issues, but not a system, which is actually only "proclaimed" by the aforementioned GOST.

Let us consider the schema of the "life cycle" of a certain item (Fig. 1). It is obvious that the technical level is determined in the technical assignment. All the procedures for the formation of the technical assignment for experimental and design development and its implementation are determined by GOST 15.001.73 "The System of Development and Delivery of Products for Production. Development and Delivery of Products for Production. Basic Provisions." This document has repeatedly been subjected to critical evaluation and today a number of "coordination barriers" in it have been eliminated (at least from the category of mandatory. It should be noted as a positive fact that GOST 15.001.73 envisions technology for objective evaluation of the first stage of the development—conducting receiving tests of experimental models to make sure that they meet general and particular technical specifications (OTU, TU).

But the mass consumer purchases not the experimental model, but the series-produced product. And the composition of the procedures that determine the algorithm for proof that series production makes it possible to produce uniform products of the required quality is today not regulated by a single state standard. The qualifications tests, like the kind of tests, had been introduced, but how on the basis of the models from the first industrial batch for correspondence to the OTU and TU can one evaluate the readiness of production to operate under real conditions? And in

keeping with the aforementioned GOST, "the tests for the initial series are conducted by the manufacturer with the participation of the developer, enlisting the client (the basic consumer) if necessary." Such is the "technology" of the organization of work for verifying the readiness of an enterprise for series production of products of uniformly high quality.

The next stage is series production, where two kinds of tests are envisioned: receiving-release and periodic. The former should give an answer concerning the quality of each item (or batch), and the latter—concerning the condition of production, but in both cases the only object of control is the prepared product. And even with periodical tests or any verifications of the stability of production, there is no in-depth monitoring of the uniformity of the quality of the products that are produced.

The aforementioned is a natural consequence of the lack of algorithms for determining the technically expedient composition of control and testing procedures when manufacturing products. The parameters of items indicated in the TU (OTU) in a number of cases are not interconnected with the indicators that characterize the stability of the quality. In particular, the reliability of radioelectronic equipment depend both on the circuit-technical and design solutions and on the quality of the batching items.

At the present time the level of requirements placed on suppliers of items of electronic equipment with respect to insurance of reliability is regulated by the intensiveness of the failures, and this amount should not exceed one failure per billion hours of the operation of the instruments (10^{-9} 1/hour). If one says that the verification of the items can last a quarter (2,000 hours), then to control the aforementioned value would take 10^6 (1 million) items (with one allowable failure). It is necessary to discard items that have been subjected to such lengthy testing. But what do such costly results of these tests tell us? Only that in those systems and conditions in which they were tested the intensiveness of the failures will be lower (with a probability of 0.6) than is required. But they say nothing about the quantitative indicators of analogous items in the specific equipment.

It is possible to do it differently (and this is the way it is done so far)—conduct more lengthy tests (10,000-120,000 hours) and then the number of items "tested irrevocably" can be reduced for the example under consideration by a factor of 10. But then the doubtful information will pertain to the items that were manufactured 3-4 years ago (other variants are presented in the table). It is quite obvious that the manufacture of batching items cannot verify something that is not required of him.

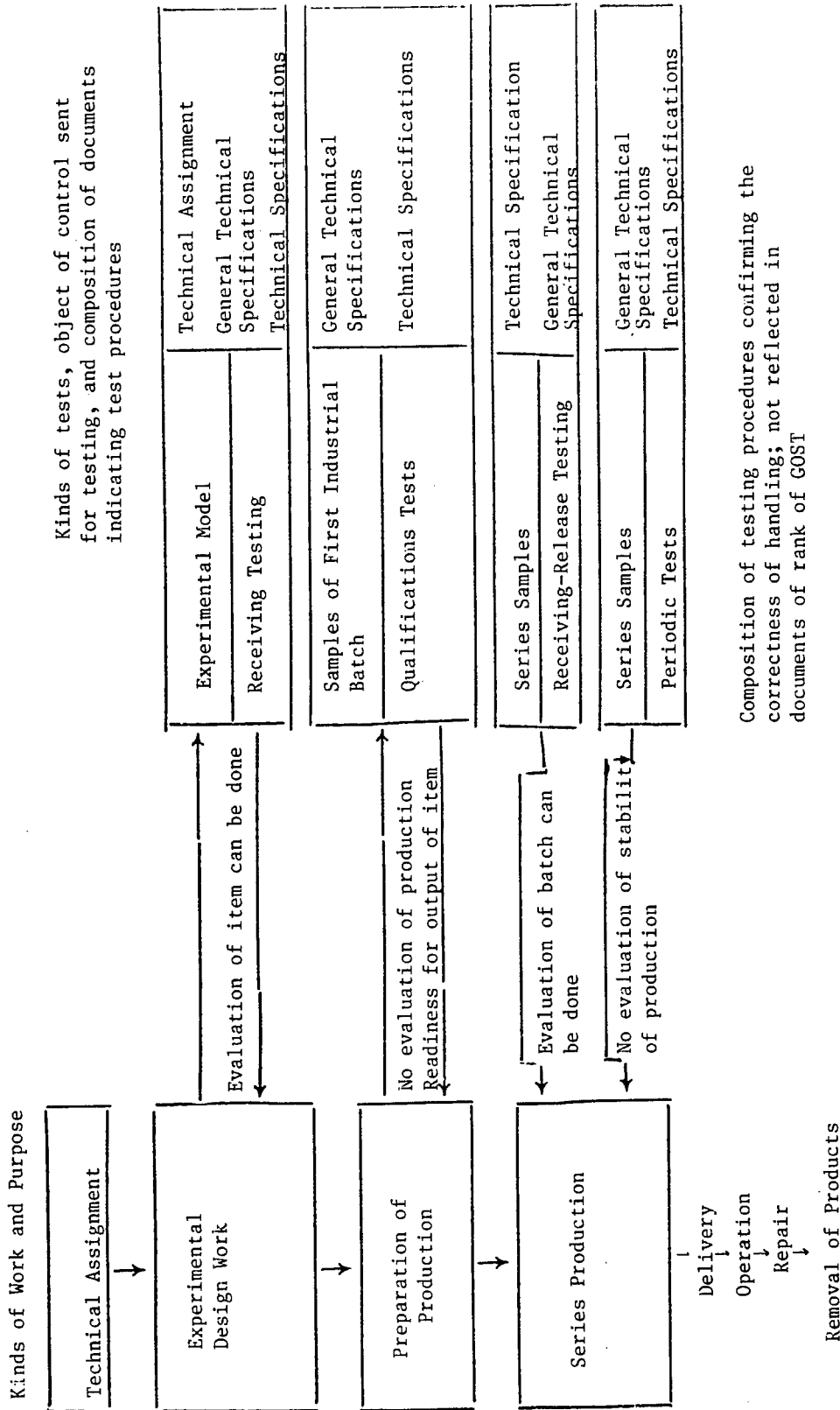


FIGURE 1 Life Cycle of Items

Number of Tests for Control of Intensiveness of Failures (number of allowable failures—1)

| 1/Hour | Number of Tested Items (Units) With Duration of Tests (Hours) | | | |
|---------------------|---|---------------|-------------|--------------|
| | 1,000 Hours | 2,000 Hours | 5,000 Hours | 20,000 Hours |
| 1.10 ⁻⁶ | 2,000 | 1,000 | 400 | 100 |
| 1.10 ⁻⁷ | 20,000 | 10,000 | 4,000 | 1,000 |
| 1.10 ⁻⁸ | 200,000 | 100,000 | 40,000 | 10,000 |
| 1.10 ⁻⁹ | 2,000,000 | 1,000,000 | 400,000 | 100,000 |
| 1.10 ⁻¹⁰ | 20,000,000 | 10,000,000 | 4,000,000 | 1,000,000 |
| 1.10 ⁻¹¹ | 200,000,000 | 100,000,000 | 40,000,000 | 10,000,000 |
| 1.10 ⁻¹² | 2,000,000,000 | 1,000,000,000 | 400,000,000 | 100,000,000 |

Moreover, this approach when formulating the requirements gives rise to a circular shifting of responsibility to the suppliers. In this situation the manufacturers of batching items for electronic equipment must search for the formulation of requirements placed on the suppliers of materials in semimanufactured products so that at least part of the responsibility for making sure that the items meet the aforementioned requirements can be placed on their shoulders.

And there is the natural question: Why include in the TU (OTU) indicators that do not characterize the quality of the batch of the specific products and cannot be verified either in periodic or in receiving-release tests? The inadequacy of the testing and control-diagnostic equipment of the manufacture of the products cannot be compensated for by conducting tests of models of items from the first industrial batches in the head testing organizations within the range of the norms of the OTU and TU.

As concerns subsequent stages of the "life cycle" of the products, which it goes through beyond the manufacturing enterprise, as was indicated above, they are not regulated either by "organizational technology" or by an efficient system of testing, and, consequently, there is no basis for an objective evaluation of quality.

Today an objective evaluation of the quality of products that are produced requires the creation of a broad list of testing equipment, the development of the "technical ideology" for control operations, automation of these procedures, regulation of maximum permissible technological conditions, and the establishment in normative acts of the USSR Gosstandart of the basic procedures, which would prove the adequacy of a particular content of the tests. And within all stages of the life cycle of the items there should be comprehensive monitoring primarily of the readiness of production to produce a high-quality product. We have many excellent technical assignments from which we have developed items that are not very suitable for output in existing productions. And by the time the productions were prepared the items had become obsolete, but they began to produce them anyway. The lack of efficient and complete organizational-technical "technology," which is registered in the state

standards "system of development and placement of products in production" will not be replaced by the work of Gospriyemka agencies. Moreover, this fact complicates the work of these agencies. It is obvious that it is impossible to control a movement without developing the rules of the movement.

Today, when all of us are extremely bothered by the problem of quality, we must actively implement the party course toward solving this problem, and Gosstandart institutes must promptly complete the formulation of organizational-technological normative acts—state standards, in keeping with which all branches would begin to create efficient systems for testing products that are produced and organizing industry for producing testing equipment.

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Series Production in Scientific Subdivision
18200012d Novosibirsk *EKONOMIKA I ORGANIZATSIYA PROMYSHLENNOGO PROIZVODSTVA (EKO)* in Russian No 10, Oct 87
pp 104-106

[Article by N. S. Oganessian, secretary of the party committee of the Machine-Building Plant, Armenian SSR]

[Text] Our association is faced with the task of increasing the reliability of products produced during the 12th Five-Year Plan by an average factor of 10, having almost doubled labor productivity. Taking into account how serious the task is, questions of control of quality and reliability have become the subject of special and constant attention from the association's party committee. We have begun reconstruction and complete technical reequipment of the plant on the basis of a comprehensive target program that has been developed which encompasses science, production, and quality. We are also conducting organizational measures for closer cooperation between scientific subdivisions and production. To this end we have introduced the positions of head

designers of shops which expediently link science and production. They give the scientific subdivisions technical assignments for the development of equipment and technology which in time become units of the unified automated system. This makes it possible to expand automation of production and, in the future, to go on to technology that does not require human beings.

The task of the scientific subdivisions includes more than the development of new equipment; they have been given the task of introducing it into production. They receive modern complex equipment for which they develop concrete technological processes for the manufacture of series-produced items. After the processing and training of personnel, this equipment, along with the service personnel, are transferred to production, and the personnel employed on outdated equipment undergo retraining for the next generation of equipment. This also makes it possible to obtain direct and reliable information about "bottlenecks" and to efficiently develop measures to eliminate them.

Unfortunately, more extensive introduction of this system is impeded by the impossibility of financing participants in this process—production workers and associates of scientific subdivisions—out of a unified source. These problems could be solved, in our opinion, within the framework of scientific production complexes (NPK).¹ We tested the effectiveness of the NPK and it made it possible to sharply improve the quality of products that are produced and to increase the percentage of output of suitable items by a factor of 1.6 while increasing the volume by a factor of 1.3. But the existing instructions do not envision such a subdivision in the table of distribution. Therefore we had to eliminate it.

As was already noted, during the five-year plan it is necessary to increase the reliability of the items we produce by an average factor of 10. For this reason we are developing organizational and technical measures. The first is an analysis of the causes of failures in order to clarify the bottlenecks and eliminate them; the second is the determination of the enterprise's possibilities of producing items of the required quality.

In order to carry out the first task, because of the fact that the items produced by the plant are technologically complicated, we use a hierarchical structure of analysis of the causes of failure of a specific item. The first unit is the shop for ensuring quality, where both batching items and prepared items undergo testing. The strictness of the testing is provided by statistical analysis of the causes of failures throughout the entire chain—manufacturing plant, type of batching item, most loaded parameter, and so forth.

As a result of the organization of the quality shop we have reached a point where failures in intake control by the consumer, as a rule, are caused only by transportation.

The second unit of the system is laboratory analysis of failures, which determines the cause of the failure and develops suggestions for changing the route of testing or introducing new tests. The third is made up of scientific subdivisions which keep track of series production and develop recommendations for increasing both labor productivity and quality and reliability. Moreover, they intervene in the technological process on the spot in order to eliminate bottlenecks through changing the technology or the corresponding equipment. Of course, these problems are solved most efficiently within the framework of the NPK's which, as has already been said, we had to eliminate.

In order to expand the possibilities of technical analysis, taking into account the high cost, the uniqueness, and the complexity of the equipment and stands on which the control is carried out, and also the professional level of the specialists servicing the tests, on the initiative of the association we are creating a unified regional center for diagnosis of the reliability of products. It should serve on a contractual basis the enterprises located in the Transcaucasian area which produce products of a similar profile. Recommendations from the center are sent to scientific subdivisions of the enterprises so that measures can be developed for changing the design and technology for the manufacture of the items.

A significant amount of work is being done to determine the capabilities of production to produce items of better quality. Precision specifications are being determined for the fleet of equipment and routes are being developed for the manufacture of items for equipment that have the best class of precision. An analysis of the quality of manufactured items makes it possible to determine the possibility of production at a given moment and also the list of equipment subject to replacement. These measures are carried out under the leadership of scientific subdivisions which, along with the startup of new equipment or the change in the route for manufacturing items, determine the necessary composition of equipment and the place for carrying out technical control.

Let us discuss one more problem that, in our opinion, is very serious. It is known that it is not enough to have good equipment, and it is not always distributed uniformly. For example, in our ministry there are several leading enterprises that are equipped with the last word in technical equipment and were the first to get it. Items analogous to the ones produced here are also produced at a number of other enterprises that are equipped without dated equipment. And, naturally, when comparing the results of the activity of two such enterprises this circumstance should be taken into account. But so far this is not being done and the deepening disparity in the evaluation of the activity of the collective is of great social significance.

Footnote

1. Concerning the experience in creating the NPK's in Leningrad and Novosibirsk see EKO, No 3, 1985; No 9.

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Product Quality Improvement Requires Comprehensive System

18200012e Novosibirsk EKONOMIKA I ORGANIZATSIYA PROMYSHLENNOGO PROIZVODSTVA (EKO) in Russian No 10, Oct 87 pp 107-110

[Article by E. B. Markosyan, general director of the Armelektroapparat Association (Yerevan)]

[Text] "It is important to have a state system that provides for a comprehensive solution to problems of radically improving product quality."

The Armelektroapparat Association is one of 28 enterprises in the republic that began to work under the conditions of the Gospriyemka beginning on 1 January 1987. We expected great difficulties because of this. We are doing the work for raising the technical level and improving the quality of the products systematically, in a planned and expedient way. Having high growth rates of the output of commercial products—40 percent during the years of the 11th Five-Year Plan, and without increasing production areas—we have achieved fairly good qualitative indicators: no less than 60 percent of our products are always marked with the pentangle of honors—the highest indicator in the republic. During the past 2 years we have received no complaints about quality and losses from defects are also low—less than 0.01 percent of a percent of the production cost. This is especially remarkable since more than a thousand enterprises consumer our products, including more than 600 kinds and types.

The technical level of the products is raised through constantly updating the products list, assimilating new items, removing outdated ones from production, and also improving the items that are produced on the basis of studying the achievements of domestic and foreign science and technology and the standards of international organizations, and also generalizing the experience in the operation of the items. During just 4 years enterprises of the association have assimilated 71 new items in production.

The comprehensive system for control of product quality (KS UKP) has contributed considerably to improving the quality of the products that are produced. It encompasses the entire complex of problems of organizing highly effective and defect-free labor in all stages of the creation and production of the items. The system we have developed is based on experience accumulated at industrial enterprises of Lvov and Minsk, and also recommendations and instructions from branch head organizations of the Standarteletro All-Union Scientific

Research Institute. The comprehensive system for control of product quality encompasses all aspects of the collective's activity: ideological, technical, and organizational.

Special attention is devoted to the development of standards for evaluating the work of shops and divisions for organizing the output of high-quality products and the appropriate moral and material incentives for workers, engineering and technical personnel, and employees. Indicators of the output of high-quality products are the basic ones when summing up the results of socialist competition among shops and the results of the fulfillment of personnel commitments of the workers and engineering and technical personnel.

Of course, the collective has always been clearly aware that the indicators they have achieved do not exhaust all the capabilities of the enterprise. We have problems that require daily solutions and there are unutilized reserves in the matter of improving the quality of the products that are produced. But still the analysis of all spheres of production conducted by the collectives during the period of preparation (beginning in August 1986) for work under conditions of increased demandingness troubled us somewhat and forced us to look at many things as though from the outside. We revealed omissions that had been allowed for years by both designers and technologists but were considered trivial and not worthy of the attention of services of the OTK [Division for Technical Control] measures were taken. Programs were drawn up and their implementation was efficiently monitored. But our enterprise, which had failed to fulfill the production plan previously, fulfilled the plan for January of 1987 by only 85.3 percent. There is no doubt that the new form of quality control—receiving outside the department—is one of the necessary and radical administrative measures directed toward preventing the output of defective products, and it is completely legitimate and timely. And the advantage from it is obvious. The joint work of representatives of the Gospriyemka and specialists of the enterprise, if they are mutually interested, can help to reveal the "bottlenecks" that cause the defects.

But the work of the enterprise under the conditions of Gospriyemka is preceded by careful preparation. Thus why should all enterprises not go through this at the same time? Then it would be possible to avoid today's difficulties caused by the lack of coordination in the work of the associated enterprises. For enterprises that have not changed over to control outside the department, unfortunately, are operating in the old way. Hence the violation of the work rhythm because of tardy delivery of materials and batching items. We are literally forced to expand our staff and outside receiving services excessively.

I think the focus in our further activities should be placed on stimulation of the output of high-quality products and then the interests of the society and the enterprise will coincide. It is time to critically evaluate

the existing system of incentives, whose effectiveness no longer suits industry; it is also necessary to sharply increase the material incentives of all workers to produce high-quality products. The system of wages and bonuses should take only the final result into account. After all, for defects in our work we practically do not withhold a single ruble from our wages, and the workers have become accustomed to bonuses as if they could expect an addition to their wages, sometimes without paying any attention to the quality of the work that is performed.

I think that the wages of controllers of the OTK should be raised to the level of the basic workers whose work they are expecting and the positions of controllers should be filled only by workers with 3-5 years of experience. As a moral influence for controllers of the OTK one should introduce into the KZOT the statement "not inspiring confidence." An example of the French firm Engenol is interesting. There when a worker comes to work he makes a written promise to work without defects. In turn, the management of the firm makes a commitment to provide him with all the necessary conditions and promptly eliminate factors that impede his performing the work entrusted to him with high quality.

But still one focus is especially important. Is our worker, engineer, or designer prepared to work better and observe technology down to the fine points? It seems to me that everyone should be aware that although the enterprise produces products worth millions of rubles, the client judges them from one item. And it must be frankly admitted that a large part of the blame for the output of poor-quality products lies with us.

The new local services of the USSR Gosstandart provide departmental control over the quality of the items that are produced. The control of the output of products is provided strictly in keeping with the technical documentation. But should anything else really be allowed? What does it mean to produce a poor product—to do one's work poorly? How does one measure one's contribution to a product that does not objectify itself for the consumer? And here it is up to the party and public organizations. They should be more active. The attitude toward evaluating the results not only in terms of quantitative, but also in terms of qualitative criteria should be developed through persistent ideological and propaganda work, and personnel should be armed with knowledge about the methods and means of providing for high product quality. The main thing now is to overcome the psychological barrier. Everyone must be made to understand, whether it is a worker, engineer, or any other worker who is directly or indirectly involved in the output of products, that he bears strict personnel responsibility for the output of defective work. Each person in his work must think frequently about such categories as duty, honor, and conscience. This is what today should become the major criterion for evaluating our activity if we want to raise a reliable barrier on the path to poor-quality products.

Practice has shown that the existence of numerous controlling agencies such as the Gosstandart, the inspection team for quality of exported goods under the USSR Ministry of Foreign Trade, the inspection team for the quality of consumer goods under the Ministry of Trade, and others, contributes absolutely nothing toward improving quality. I think that the system approach would be the most justifiable. It is necessary to have a clear-cut unified state system, possibly with certain differences for various branches, that provides for radically improving product quality.

From the Editors:

And so the basic, principal conclusion from the discussion in the EKO Directors Club is that product quality, like, incidentally, any other pressing economic problem, cannot be discussed separately from improvement of the economic mechanism and economic levers and stimuli. Whatever awaits the consumer of tomorrow's products depends on how fundamental and consistent the decisions made by central agencies in this area will be. The introduction of the Gospriyemka, of course, will play its role, mainly in imposing order in production. But the real effect will be achieved if economic levers for improving product quality are fully put into effect. In this connection we are placing special hopes in the system of measures for implementing the decisions of the July (1987) Plenum of the CPSU Central Committee.

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Questions About Quality Control Answered

18200012f Novosibirsk *EKONOMIKA I ORGANIZATSIYA PROMYSHLENNOGO PROIZVODSTVA (EKO)* in Russian No 10, Oct 87 pp 111-114

[Article by V. D. Rechin, candidate of economic sciences, Institute of Economics and Organization of Industrial Production of the Siberian Branch of the USSR Academy of Sciences (Novosibirsk): "Directors—On Quality Control, A Survey of Answers to a Questionnaire of the Directors' Club"]

[Text] It is a tradition of the all-union directors' club to prepare a discussion of the basic issues of the next meeting using questionnaires of the participants. This was also the case this time. The organizing committee received a total of 62 questionnaires (from directors of enterprises of machine building, electrical equipment, instrument building, ferrous and nonferrous metallurgy, the fuel and timber industry, electric energy engineering, light and the food industry, and other branches located in the European part of the RSFSR, the Urals, Siberia, and other union republics). On the whole in the USSR in 1985 the proportion of products of the highest quality category amounted to 16.5 percent and in the first half of

1986—15 percent of the overall volume of products subject to certification, on an average for enterprises represented in the questionnaire it was more than 40 percent.

Question 1. What Is the Effectiveness of the Systems Applied for Product Quality Control?

At all enterprises (whose managers participated in the questionnaire) except for four, the KS UKP is or has been in effect. At the majority of them it has been in effect since 1978-1980, and at the Rastov Gorizont Association and the Gomel Elektroapparaturna Plant—since 1974.

Among the merits of this system the directors include the fact that it pertains both to technical and to economic, social and organizational aspects of the problem, to all stages of the life cycle of the product, and to all levels of management at enterprises, and it makes it possible to regulate and coordinate them.

At the same time, the practical application of the KS UKP revealed a number of shortcomings of the system. They include the following:

The fact that it is cumbersome and the excessive number of indicators and standards of the enterprise. The complete implementation of the system requires so many workers, especially engineering and technical personnel, that it is impossible to assign them. Therefore not all of its elements are actually in operation.

The lack of coordination of the KS UKP with other subsystems of the overall system for management of the enterprise, and, after all, it is one of them.

The small chance of influencing the suppliers of materials and equipment.

The significant delay of feedback (both from the suppliers and from the consumers).

The unsatisfactoriness of quantitative criteria of quality.

The difficulty in providing for reliability of information concerning deviations in technological processes and violations of labor discipline.

The direction only toward punishment (withholding of bonuses) and not toward encouragement.

The insufficiently developed policy for evaluating the upper levels of management (for example, the amount of the coefficient of the quality of the work of the enterprise does not influence the wages of its manager).

The methodological support and the implementation of the subsystem "Technological Preparation of Production" (quality of development of new designs, preparation of instruments and fittings) lag behind.

There are no recommendations for improving the KS UKP.

Probably the best generalizing evidence of the shortcomings of the KS UKP is the fact that this system has been introduced practically everywhere but product quality cannot be called good: only 15 percent of the products have been awarded the State Emblem of Quality.¹

Question 2. What Are the Basic Factors in High Product Quality?

The majority of the directors (38 out of 62) referred to the fact that product quality depends primarily on the enterprise. In one of the questionnaires the answer to this question was as follows: 90 percent of product quality is determined by the enterprise itself and 10 percent by other factors.

Among the internal factors, along with technology, incentives, and so forth, the interest of the director is noted.

If internal factors are so important now, in the future, the majority of enterprise directors think, they will become even more significant.

Among the external factors, especially important ones are the quality of raw materials, processed materials, batching items, and equipment, and in the future there will be the position and nature of the management of higher agencies. The consumer today has little effect on product quality, as was noted in the questionnaires; agencies monitoring quality have considerably more influence. In the future the situation should change.

The scientific and technical level of the items, and, along with this, their ability to compete, depend very significantly on the developers. Who are they?

All documentation at 13 enterprises is developed only through their own forces, 8—receive all of it from the scientific research institutes and design bureaus of their branch, 1—from scientific research institutes and design bureaus of other branches, and 1—from the head plant of the association; the remaining 39 enterprises have several developers, several being more than five, including foreign ones.

Question 3. What Advanced Experience in Quality Control Do You Know About?

Such experience exists in almost all enterprises whose directors filled out the questionnaire (although only three of the 62 directors indicated their own experience). First and foremost these are enterprises that produce practically only products of the highest quality category and export a significant proportion of them abroad. They include the Novosibirsk Tin Combine, the Tyumen Shipbuilding Plant, the Tiraspol Sewing Association, the Ryazan Plant for Peat Machine Building, the Gomel

Elektroapparatūra Plant, the Vyaznikov Plant for Lighting Equipment for Tractors, the Izhorskiy Zavod Production Association, the Yerevan Armelektroapparat Association, the Bryansk Furniture Factory, and others.

Among the other enterprises where product quality control is worthy of study and emulation, the questionnaires named: AvtoVAZ, the Sumy Machine-Building Association imeni Frunze, the Minsk Tractor Plant, the Kriogemash Scientific Production Association, the Kuybyshev Plant for Electric Tractor Equipment, the Dnepropetrovsk Plant for Automatic Mining Machinery, the Minsk Atlant Association, and the Krasnodar Plant for Measurement Instruments.

At the same time more than half of the directors did not name any enterprise whose experience in product quality control could be used as an example (some of them noted as a matter of principle: there is no such thing!); and many pointed out the shortage of information regarding it.

Question 4. What Do You Expect From Science?

The poor quality of products that are produced is related to a considerable degree to the poor scientific development of a number of issues.

The plant workers expect recommendations on the following subjects:

Quality and quantity—their interaction, including an account of the volumes of products produced by the enterprise as it is adjusted depending on quality.

Further improvement of the concept “consumer qualities” of the products.

Methods of forming demand.

Improvement of price setting (more complete and efficient accounting in the price for changes in product quality).

Refinement of the concept “world level,” “foreign analogues,” and also “base model.”

An evaluation of product quality in connection with the evaluation of the quality of the labor of the collective (engineering and technical personnel and workers).

Incentives and penalties for quality at all levels (from the ministries to the work brigades). Developers of new technical equipment should bring their “offspring” up to the highest quality category.

How to most effectively motivate the collective to struggle for quality. Quality groups under our conditions.

Quality and norm setting (a more precise accounting and calculation of the need for capacities, labor force, materials, and so forth).

An optimal structure of control of product quality at the enterprises. A determination of the functions of the divisions for quality control. Organization of training in quality control, including express control.

Generalization of foreign experience in product quality control.

Footnote

1. For more detail on the KS UKP system see EKO, No 7, 1986.

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Possibilities of Miniplants Explored

18200012g Novosibirsk EKONOMIKA I ORGANIZATSIYA PROMYSHLENNOGO PROIZVODSTVA (EKO) in Russian No 10, Oct 87 pp 115-135

[Article by Yelena Lysaya: “Miniplants: Intention and Reality”]

[Text] Zhlobin (Belorussia), Rybnitsa (Moldavia) and Komsomolsk-na-Amure—these are the first three places where the idea of miniplants is being realized in our country. And for the idea of compact metallurgical enterprises, which EKO has recommended since the first years of its publication,¹ is being realized. Neither mines, nor enriching plants, nor blast furnaces—they need none of this. Install two or three electric furnaces and give them metallurgical wastes, and they, these powerful “electric casseroles,” will prepare “bouillon” every 110-120 minutes. All one has to do is “adjust the seasoning” in the shovel and put the metal into the continuous smelting machine. And the ingots are prepared for rolling.

Such plants can be constructed wherever you want them as long as there is enough scrap metal. Because of them the regions that are most distant from iron ore raw material and the main metallurgical centers do not have to worry about obtaining metal. Transportation is relieved of extremely large shipments.

Incidentally, it has actually turned out that the miniplant in the Far East has ceased to be independent and has become a new shop of Amurstal. True, people in the branch are now bitterly throwing up their hands, especially in Soyuzmetallurgprom: if they had continued to be constructed as an independent plant they would have received housing, social, cultural and domestic institutions, but the way it is these possibilities have been

sharply reduced. Incidentally the litmus paper of the practical expediency has appeared—everything is exactly as it should be: in the existing metallurgical center the structure of the miniplant has turned out to be fortuitous.

We admit that EKO's predictions of the possibilities of creating metallurgical miniplants made at the end of the 1970's were extremely pessimistic: "In our country there is not a single miniplant, but there are also no intentions to construct such enterprises, at least in the ministries."² The course toward intensive methods of development and the appearance of new capabilities of metallurgical equipment have now led to the realization of the idea of such enterprises.

The Belorussian Metallurgical Plant has reached its planned capacities and there is already confidence that they can be surpassed during the years of the 12th Five-Year Plan. In the first quarter of 1987 Moldavian metallurgists reached their planned figures. But still the joy of "victory" is intermixed with the bitterness of unforgivable mistakes. In establishing miniplants many mistakes were repeated which are inherent in the construction of many new enterprises, and new specific mistakes were revealed which did not exist in the construction of the next compact metallurgical plant. For there is no doubt that the first three are only the test models. Lithuania, Estonia, and many regions of Siberia and Central Asia which are the most remote from metallurgical centers are waiting for these plants. And yet in Soyuzmetallurgprom they are already saying: "Let the next ones be constructed by anybody who wants them, just so long as it is not us. We have had enough of these. The advantage is 'mini' and the troubles are 'maxi.'"

"If This Is an Experiment, Let Them Say So"

The director of the MMZ was not in his office during the first half of the day. And, as is always the case on Monday, there were many people in the reception room. The local residents had also accumulated many questions over Saturday and Sunday, but they came and went. But those who had been sent there sat patiently and stubbornly. As they say at the plant, "the pushers are pushing each other." To be sure, they were both planners and workers of the scientific research institute waiting for the director. But the "petitioners" for metal were also actively arriving. What was left for them to do when the funds had been received at the Moldavian Metallurgical Plant? Yet they were far from producing the planned quantity of rolled metal. In another place they were unable to "bargain off" their funds and therefore they were becoming persistent with respect to the official suppliers. But at this time the director was taking care of the next emergency in the electric steel-smelting shop. A year and a half after the official signing of the document to put the shop into operation everything continued to be in a muddle....

From the plant report on work in 1985:

"A great deal of harm was caused to the plant by the breakdown of the furnace transformers because of design shortcomings. Furnace No 1 stood idle for 56 hours, and Furnace No 2 for 57. The losses allowed by the arbitration board to be reimbursed from the Moscow Elektrozavod Association amounted to 586,000 rubles, and the complete losses caused to the MMZ were 4 million rubles.

"Because of the unsuccessful design of the machine for continuous smelting of billets (MNLZ) the input of metal was constantly being interrupted, the roller chain of the machine and injector failed, and much time was lost on cleaning them. It is intended to redesign the MNLZ, after which it will be possible to keep up with the production schedule for continuous smelting. Cost of reconstruction—608,000 rubles."

The director made his appearance after 12, tried to hear everyone out, to clear out the reception room and, having freed up a certain amount of time, agreed to comment on this.

"If at the MMZ there is an experiment in creating miniplants, let them say that," declared Anatoliy Konstantinovich Belitchenko. "After all, everything is new here—from the design of the electric furnace, the transformer, the machines for continuous smelting of billets to the last screw in the rolling mill. The construction methods were the only things that were old. There is not a general supplier of equipment, and on every occasion I must go to an unimaginable number of various administrative instances, plants, and institutes. The general designer also turns out not to be general when a problem arises regarding some special part of the plan. He sends me to his co-workers, and the general construction contractor does the same thing. Once I managed to get them all together in the same place. There came 120 people from various organizations, but not from all of them.... And the minutes of the conference that took place in 1985—10 months after the official signing of the document for putting the electric steel-smelting complex into operation and 4 months after the startup of the rolling production, turned out to include 400 points concerning imperfections in the development of the equipment. If you will understand that they changed the most obvious, which had to be recognized. We bypass certain problems so as to draw attention to the main one."

...This conference was discussed by almost everyone I met at the plant. They say that the actions was impressive. And it was given an impressive name: "Interbranch Conference on Accelerating the Startup of Capacities." You will agree that a great deal of respect was shown for a small plant: at the highest—interbranch—level!

Yet if all these interbranch problems had been solved at such a high level previously, by rights it would not have been necessary to take away responsible workers of the ministries, departments, scientific research institutes, and planning and construction organizations to journey to Moldavia. For in October 1982 in Novosibirsk developers and clients of the modern electric steel-smelting complex gathered in the production association Sibelectroterm to discuss problems of its creation and operation. Here, at Sibelectroterm, was the birthplace of the first 100-ton arc electric steel-smelting furnace with a powerful transformer in the country, as a result of which the speed of smelting increased many times over. Not 5-6 hours, but about 2—such is the time it takes an aggregate like this equipped with a transformer with a capacity of up to 80,000 kilovolt amperes instead of 25,000 and 35,000 in the previous transformers. Actually, on the basis of the new technical base it has also become possible for there to be miniplants composed of the new electric furnaces, machines for continuous smelting of billets, and a rolling mill.

Many points in the minutes of the two conferences are similar enough to be related:

Novosibirsk, 1982. Problems of gas purification need to be solved.

Rybnitsa, 1985. The system of gas purification is unsatisfactory (developer—VNIPIGazoochistka of the USSR Ministry of Ferrous Metallurgy, Kharkov), which reduces the intensiveness of smelting and leads to pollution of the atmosphere.

Novosibirsk, 1982. And the design of the electric steel-smelting furnaces and plans for divisions for comprehensive processing a scrap of metal are poorly developed.

Rybnitsa, 1985. Divisions for comprehensive processing of scrap metal are poorly designed by the developer, Ukrgiprommez. It does not have a roof. As a result, during the fall and winter, there is precipitation, and ice coating forms, and the equipment must frequently be shut down. The scrap metal comes from Vtorchermet poorly sorted, it contains a good deal of sulfur impurities and nonferrous metals, and the proper conditions have not been created for additional sorting. Moreover, the plan for the placement of the cranes and cargo flows are so imperfect that even the work envisioned by the plan for preparing scrap metal for utilization in the furnaces is difficult. Moreover, they have envisioned one density for scrap metal, but in practice the situation is quite different and the density is much less. Therefore it is impossible to load the furnace just once, it is necessary to do 2-3 additional loadings and add scrap metal. The schedule for smeltings is violated.

Thus the question of "secondary" utilization of metal has become one of the primary ones. Today both the divisions for comprehensive processing of scrap metal

and technical supply of enterprises of Vtorchermet require the most attentive attitude and the fastest possible solution to the problems that arise.

The transformers, the static voltage equalizers, the poor insulation of furnaces' electrical adapters, and the shortcomings in the design of the bucket for loading the charges into the furnace—all these comprise the subject of attention in 1982. And all of this was repeated in Rybnitsa.

The weak place in the transformers were the vacuum switches: they burn. And it is frequently necessary to use them since the design envisions 23 voltage levels. This is clearly excessive for furnaces that operate in miniplants that are intended for a fairly small assortment of rolled metal. In imported transformers that are used at the metallurgical plant in Staryyoskol, there are 17 levels for the largest electric furnace—150 tons.

Up to this point the static thyristor voltage stabilizers—STK—are not being operated as planned either. In and of themselves they are an advanced technical solution. Their purpose is to provide the possibility of simultaneous operation of two electric furnaces with a relatively small capacity of the electricity networks. This is of immense significance for Moldavia. The All-Union Scientific Research Electrical Equipment Institute has been slow in completing their development.

But the one that is the most trouble today is the complex for continuous smelting of billets, which is still far from the normal level of operation. This technological process, although it was created in our country, was not developed here for more than 20 years since with the outdated marten method of steel production it could not be included in the technological chain. It began to make a way for itself only with the development of oxygen converter and electric steel-smelting processes. Therefore everything here is new, especially in the casting of small billets. Machines for continuous smelting began to be assimilated earlier at metallurgical enterprises that produce sheet metal and high-grade rolled metal. But the Moldavian metallurgists are almost constantly losing metal, either because of the unsuccessful design of the intermediate bucket or because of the dosers or crystallizers, or on the other hand because of the hydraulic cutters. The MNLZ began to be reconstructed immediately after it had been in operation for a couple of days. Soon there will be little left of the technical solutions of the developers, but this does not bother them very much. They are in no hurry to react even to the direct telephone appeals of VNIIMetmesh, the developer, and the manufacturing machine building plant.

"We have nothing against new design and technological solutions," says the director, "and someday it will be necessary to begin the development of domestic miniplants. Let us be the experimental plants and let everything be tested here. But then it will be necessary to develop the appropriate management approaches. They

have tried to squeeze us within the framework of the construction of an ordinary plant, and within a year and a half after the signing of the document for release into operation, they began to plan a level of production which was possible only for an enterprise operating under normal conditions.

A Fake Document and a Nonfake Plan

Almost all the leading plant specialists returned in our conversations to the procedure for signing the document for the startup of the MMZ in various variants, thinking that many problems would ensue from the fake document. The first test smelting was scheduled for the middle of October 1984 when it was extremely clear to everyone that it could only be on paper, for the sake of a report by the date for celebration in the republic. Molds were brought in from somewhere especially for this purpose since the continuous smelting machine had not yet been put into operation. The metal solidified in the mold stood for a long time as a memorial to the false reporting and inefficiency. Then they took them apart and took them away.

On 25 December 1984 the startup was begun seriously. But the plant was not ready for operation by that date either. The authorized commission that had gathered in Rybnitsa consulted and departed, postponing the signing of the document until 10 January 1985—the earliest date when it would be possible to put the 1984 project into operation. The officials of the Ministry of Ferrous Metallurgy and the republic did not want to push the date back any further. Having closed their eyes to the imperfections, the commission signed the fake act.

The third director came several months later, but even then the MMZ was not ready for normal operation. The 400 points of omissions in the minutes of the meeting in October 1985 tell of this eloquently....

“Belitchenko did not sign the document for starting up the plant in its current condition,” some assert. “There was no way for him to avoid signing,” others skeptically refute this assumption. “From the standpoint of the present day everything looks different. Now nobody will artificially improve reports regardless of how much pressure is applied. At that time it was impossible to resist the pressure from the higher ups in the republic management staff who demanded that the plant absolutely must be started up in 1984. The second director who signed the document was no newcomer in metallurgy. Before coming in Rybnitsa he had been in charge of a large shop at KMK for many years....”

Everyone has already forgotten about the first director of the MMZ, although it was under him that the foundation was laid for the labor situation in which the enterprise ended up. A builder by education, he did not even try to delve into metallurgical equipment and technology, preferring purely construction planning. When one of his

assistants suggested “it is time to speak about technology,” it fell on dead ears and he would ask the next question: “And what about the compressor, has it already been delivered?”

Well, what about the Ministry of Ferrous Metallurgy and the Soyuzmetallurgprom VPO which were joined by the first three compact enterprises? It would seem that they would be the first to show concern for the normal development of the first miniplant. Was it not clear to them that at this rate it was impossible to load new technical equipment which had not even been tested anywhere yet?

World practice shows that it takes no less than a year and a half after startup to bring the miniplant up to the planned conditions. The VNIETO and the Sibelektroterm Special Design Bureau suggested several times that they approve by an order of two ministries—the Ministry of Ferrous Metallurgy and the Ministry of the Electrical Equipment Industry—a joint schedule for the assimilation of the electric steel-smelting complex with its reaching its planned level within a year and a half. At this moment the metallurgical ministry was holding a different position: there is a plan—let them fulfill it. And as a result, with the significant design shortcomings of the equipment and the poor qualifications of young collective—there were frequent emergencies and down time of equipment.

“Without having the first miniplants operate under experimental industrial conditions it is impossible to assimilate these principally new enterprises. Work under stress situations from the very first day, with the threat of failure to fulfill the plan hanging over their head like the sword of Damocles, makes concern for assimilation take a back seat to the current plan,” I was told in Moldavia. “And what has happened as a result? We still did not reach the planned level until the first quarter of 1987.”

Even under the third director, 50 times they failed to pour all of the metal from the bucket into continuous smelting, and twice the steel went directly into the furnaces: the first time—30 tons, and the second time—all 100 tons. It was not until after this that the branch began to be persistent and persuaded the Gosplan that it was necessary to change the production assignment. Hastiness and the unsuccessful approach to assimilation ended up in excessive technical, financial, and moral outlays and, in the end, a loss of time.

For Whom Is It Easier in the End?

In Rybnitsa I was told with a certain amount of envy that the Belorussian Metallurgical Plant has it much easier: they received an enterprise that was completely “turn-key” and all that was left to do was work, for here they had to fill out the technical equipment and complete the construction—everything was on the shoulders of the metallurgists. How surprised I was when I heard in

Zhlobin: "Of course it will be easier for the Moldavians to work. They are working now so that later they will not have the kinds of problems with which we will begin."

In such cases people frequently say: "One man's trouble is another's good fortune." But still each is right in his own way. When the MMZ goes through the trials of finishing up and modernizing, in which it itself participates so actively, when a skilled collective is finally formed and the technological process has been worked out, it will be possible to operate normally. For the question is when will this happen, how much will this cost the national economy, and why must a new enterprise pass over this thorny path each time?

The actual expenditures on the construction of the MMZ exceeded the initial estimated cost by almost 100 million rubles. And this when many expenditures were not included. A plant which has not yet gotten on its feet is carrying out reconstruction and technical reequipment. Moreover, the complex for continuous smelting of billets is being subjected to reconstruction for the second time. In Soyuzmetallurgprom and at the plant I was told enthusiastically that with the help of science they had found an original technical solution for simplifying the MNLZ. When the unsuccessful hydraulic cutters for cutting the billets are replaced with impulse cutting with an explosion according to the method of scientists of the Kharkov Aviation Institute, the MNLZ will operate more stably and reliably.

Simple logic tells us that since the reconstruction was needed immediately after the startup of the new equipment, the expenditures on it should be borne by the developers and manufacturers of the MNLZ. No way! Their design imperfections did not cost them a single kopeck. Everything is being paid for by the plant.

"From which funds?"

"From expenditures on capital repair," explained the chief of the technical division of the MMZ, V. V. Medvedev.

"And will the bank allow this?"

"It has allowed it up to now...."

Alas, literally an hour later in this same office of the chief of the technical division I became convinced that they could no longer count on the "kindness" of the financial institutions. Having analyzed what was at least a strange situation in the new enterprise, which, without having learned to walk yet has been included among the elderly, the Stroybank demanded explanations and halted the financing of the reconstruction.

So the plant, being guilty by default, ended up in another financial impasse.

At the Belorussian Metallurgical Plant when they talk about future difficulties they have in mind primarily the changeover to domestic analogues for batching items and spare parts. The foreign trade organizations scrimped on some things in purchases where this should not have been done, some things will have to be replaced in any case when the time comes, but it is not yet completely clear who will supply the spare parts and batching items. Moreover, they cannot forget about the fact that the plant in Zhlobin was released "turnkey," and that the Belorussian metallurgists received a completely ready enterprise.

The BMZ was constructed under contract from the Fest-Alpine firm (Linz, Austria). The contract included design and "turnkey" construction of all the necessary structures with the delivery of all the equipment for smelting 700,000 tons of steel and producing 500,000 tons of rolled metal carbon and low-alloy steel and 200,000 tons of cast billets.

Moreover, Fest-Alpine also had quite a few associates, but the Belorussian metallurgists dealt only with this firm. Its representatives were constantly in Zhlobin and took responsibility for all the problems that arose during the process of assimilation. In addition to construction, the firm provided for delivery and installation of equipment, "software"—services for developing software for automation of the plant—test operation, and training the client's personnel.

In spite of the undoubted advantages, the method of "turnkey release" is not being realized in the construction of industrial facilities in our country. Moreover, even the organization of comprehensive construction and installation work and complete deliveries of equipment are turning out to be an impossible goal. In essence, neither management methods nor the system of incentives is oriented toward this.

If Sibelectroterm can be paid for an electric furnace without transformers, automatic equipment, electrodes, cable or certain other parts that are necessary to the electric steel-smelting complex, why should it be concerned about the complex as a whole? If the VNIIMet-mash, having developed the machine for continuous smelting of billets, the intermediate shovel and the hydraulic cutters, can avoid responsibility for an unsuccessful design, why should it worry if the mechanisms turn out to be not completely effective?

The method of "turnkey release" will not get off the ground until the corresponding organizational and economic mechanism has been developed. Equipment should be paid for after the delivery of the entire set, and the associates should be financed not directly, but through the general supplier.

"And the general designer and general contractor should bring the plan up to the point where it reaches its planned capacity," says the deputy chief of the plant's

division for labor and wages, V. P. Belchenko. "In addition to the first document concerning the startup, there should be a second document for when it reaches its planned capacity. We have spent a good deal of money on eliminating mistakes, but not a single institute has suffered from this. Maximum responsibility—this is to take away the bonus of the head engineer of the plan for the division for comprehensive processing of scrap metal."

On the Mercedes, the Volga, and Management

There are technical problems with the creation of mini-plants but from appearances one would think that few people think about developing principles for the organization of production and management of them.

"And yet an experiment is also being conducted in the organizational and managerial sphere, and one must be no less thoughtful concerning it," the deputy chief of the division for scientific organization of labor and wages of the MMZ, Viktor Petrovich Belchenko, correctly noted.

At the MMZ during the first year the downtime of equipment was high not only because of technical blunders. The head specialists and executives themselves planned the increase with their own hands. There is such a procedure in the metallurgical industry as "loading." It is done in the autumn of the year before the year being planned. For "loading" the enterprises send to the ministry "diehards" who know both production and planning.

Zapsib, whose experience in 100-percent fulfillment of contractual commitment was approved by the CPSU Central Committee, was one of the first subsystems in the ASU to develop the subsystem "Loading." The computer helps to consider all the variants of loading and to select the optimal one, which makes it possible, on the one hand, to make the best use of equipment, and, on the other, to meet all of the contractual commitments. When they go for planning the loading of the branch, Zapsib workers are always prepared, armed with their counterproposals for fulfilling order-schedules.

Correct loading is especially important for miniplants. While the giants can maneuver their equipment, here a mistake in loading cannot be corrected. In 1986 the MMZ was forced each month to manufacture all at once 24 profiles of rolled metal which comprised its annual assortment. And it would have been possible to distribute the orders so that they could produce no more than eight profiles each month. This is a typical management mistake, but it was felt in production no less painfully than a technical one. The planning and production divisions had already prepared ahead of time, jointly, for the plan for loading for 1987. They developed six variants, calculated the productivity of the steel smelting and rolling equipment and equipment for continuous smelting of billets, and considered the economic possibilities of the enterprise in the various periods.

"It is no easier to build a collective than it is to build a plant," says MMZ director Anatoliy Konstantinovich Belitchenko. The skilled metallurgists who were invited, about 800 workers and engineering and technical personnel, gathered from all corners of the country loaded with various ideas and production traditions. A large part of the collective was gathered locally. Former vineyard workers and farmers, they did not even have an idea of what a metallurgical plant was. It was necessary to create services and divisions ahead of time and staff the brigades with workers so that they could work on their shifts several months before startup, participate in the installation and adjustment of the equipment, and even by that time they felt as though they were a collective. There is no better way of learning production and technical equipment than to assemble and adjust the mechanism with your own hands. But the ministry did not provide complete staffs until just before the startup. It was necessary to learn during the process of production, right at the workplaces. The mass emergencies and down time were the consequence not only of the design shortcomings of the equipment, but also of this approach to the formation of a collective."

"Perhaps there is some point now in hiring experienced specialists in management and conducting classes in the form of business games so as to feel out the 'hot points' of the contacts of the shops, divisions, and services?"

This question from a correspondent evoked a sharp negative reaction from Anatoliy Konstantinovich: "We have no time to play," he objected, "we must get our work done."

Belitchenko is an energetic manager, he has a strong will, and he does not lose his bearings in extreme circumstances. One must also recognize his knowledge of production. Before coming to Rybnitsa he was in charge of one of the largest shops at the Novolipetsk Metallurgical Combine. He began every working day at the MMZ in the shops and delved into the details of all the production collisions. At first it was not a bad thing that he was not an office worker. But time passed and his intense interest in concrete shop problems ended up in serious mistakes. Many problems of management had to be put off because he did not have time for them.

People in the shops also had a certain reaction to the director's decisiveness and his desire to handle everything himself. People stopped having a sense of moral responsibility for their sections. They became passive and dependent.

When things settled down it was at great cost. When in spite of common sense and the schedule for planned preventive repairs they decided not to shut down a furnace and to obtain additional tons of steel, the price they had to pay for neglect of management and organization of production was too high. The furnace changed from a place of burned fettlings into an object of two of the largest emergencies. First 30 tons of metal spilled

onto the ground and then all 100 tons (again a management error—they tried to make do with minimum measures when a large-scale repair was needed).

Now there is finally some kind of regulation of management activity. A schema has been prepared for the interaction of services and charts have been developed for regulating the service of equipment and the responsibility of participants in the technological process and repair brigades. Following the method of the Magnitogorsk Metallurgical Combine, they have introduced books with detachable coupons for warnings, which are taken into account when calculating bonuses. The work week begins with the director's operations meeting. It has become the practice to have a monthly economic report. On previously determined days they discuss future problems of the plant's development. But this is after two critical articles in the central newspapers and after a decision of the plant's party committee that pointed out to the director the need to improve his style and work methods.

And here are some lines from an order of the Ministry of Ferrous Metallurgy regarding another miniplant—the BMZ: "To clarify the functions of the structural subdivisions of the enterprise in questions of organization, technical support and management of production and the enterprise as a whole. To create a training-production base...."

This order, according to the results of the first half of 1985, seemed to sum up the initial period of the activity of the plant in Zhlobin. The order was at least a half-year late. It should have preceded the beginning of production. Mikhail Grigoryevich Tikhonovskiy, who accepted the plant in September 1985, made this diagnosis of the organizational-management condition of the BMZ: "There is no mutual understanding in the management staff, the functions have not been clarified, and the boundaries of responsibility have eroded." To be sure, Tikhonovskiy was not the third, but only the second director, and therefore he was responsible for fewer of the confusing managerial problems. The first director, as those who have worked in Zhlobin since the beginning of construction say, wasted too much time on representation at the higher administrative levels and drove around in a "Mercedes." He derived no advantage for the enterprise. The daily problems of the metallurgists were poorly solved and housing construction fell further behind schedule each year.

Mikhail Grigoryevich Tikhonovskiy decided to turn over the Mercedes to the contracting firm, preferring a Volga and other means of transportation which were quite adequate for a small enterprise. He spent all his time forming the collective and solving social problems, relying on the rich experience of the Magnitogorsk Metallurgical Combine where for many years he was the chief of production. Each week he had an operation meeting on housing. With the startup of the second section of the BMZ, as a result of which they created the

production of metal cord for the automotive industry (large MAZ's, BelAZ's produced in Belorussia had long been waiting for reliable "footwear"—tires containing metal), and it was necessary to hire another 2,000 people. They decided to construct three dormitories through their own forces, to enlist youth, and to train them in the new professions. Once a month, on Saturday, the director would hold an operations meeting in the residential microrayon of the workers which was devoted to building up the settlement.

It was very difficult later to make up for everything that had been omitted in the beginning. At the BMZ they are still clarifying the functions and developing the inadequate official instructions. But both in Belorussia and Moldavia all other difficulties of the noncomprehensive approach to the assimilation of capacity fade in comparison to the mistakes in the organization of repair production. The situation has turned out to be so confused that the enterprises still cannot figure it out.

Version No 1, the BMZ, the chief of the division for scientific organization of labor and wages, Oleg Valentinovich Shumilov: "Foreign miniplants work on two shifts and the third shift is for technical service and preventive repair. All of Saturday is a repair day and Sunday is a day off. The electric steel-smelting furnaces are kept hot with ordinary gas heat. Capital and medium-term repair of equipment are done by a specialized repair firm, and the organization of the workers based on the block system of repair. The repair firm replaces malfunctioning blocks with new ones, and it takes the old ones and repairs them at its own shop.

"This is the proposal of Fest-Alpine for the BMZ: 90 percent of the repair work is done by specialized organizations from the outside and 10 percent is done by themselves, mainly current service for production. The construction plan did not include repair shops and the repair services are extremely small. The general planner—Ukrgiprommez—made small adjustments in a number of personnel, but approved the orientation toward centralized repair: it was assumed that we would obtain 90 percent of the spare parts through cooperation. It was not intended to create a repair base. The idea was for the plant staff to control technology and everything else would be provided by centralized repair organizations of the Ministry of Ferrous Metallurgy: Energoremont, Chermetmekhanizatsiya, Domnaremont, and so forth. A good idea, and there would be no objection to it if it were not based on sand. There was a total disaster because the Ministry of Ferrous Metallurgy had no repair organizations for hundreds of miles around since Belorussian did not have any metallurgical plants. During the most difficult months, when the equipment was being assimilated, and when the qualifications of the personnel were still poor, we ended up without handymen, repair-electricians, or sanitary and technical engineers. Then we had to hastily add repair staff, but during the first months we were in terrible shape and the down time of the equipment was much greater than it could have been with normal operation."

Version No 2, MMZ, chief of the division for scientific organization of labor and wages, Vladimir Tikhonovich Shcherbina: "Ukrqiprommez envisioned centralized performance of 75-80 percent of the repair work. We must receive all of the cast pieces for repair from the outside, and also 70 percent of the parts after mechanical processing. Therefore the most minimal repair base was planned. But the Ministry of Ferrous Metallurgy did not organize specialized repair sections for its services and it had to hastily issue two orders one after the other with approximately this content: because of the absence of conditions for conducting centralized repair, it is necessary in 1985 to envision 273 industrial production personnel in addition to the plan. A year later—another 251 people. If everything were according to the plan, the staffs would have been formed differently. Now it has been necessary to create two repair shops as an emergency. The position of deputy director for technical support for production has been introduced. The head engineer engages only in technology."

Version No 3, deputy chief of the Soyuzmetallurgprom VPO, Ye. I. Grinberg: "There is some point in creating centralized organizations in places where there are large volumes of repair work. But the MMZ and the BMZ are 'small fry.' The repair workers will have a lot of time with nothing to do. Therefore we have added staff to the miniplants so that they can do their own repair service. And then in the orders for them they added more staff for repair, and some of these people can be used in other sections."

With the agreement of the VPO, repair workers were actually used to augment other services. But here is what the metallurgists say about the reasons. V. T. Shcherbina: "The organizational structure and the staffs have not yet been determined by normative documents. In addition to this, the collective of the Dnestr water intake facility of 157 people has been added to our staff. We constructed the water intake facility along with the cement plant and the Ministry of Municipal Services of the Moldavian SSR. We were actually forced to augment our own administrative services as well because the plant was produced without an ASU. The planners fulfilled the technical assignment and the plan for the ASU, ordered the computer equipment, and considered their mission accomplished with this. So far there is no working plan or program support. The automated measurement in the ASUTP barely flickers. It was necessary to create as an emergency a large ASU division" (70 people at one miniplant!—Editor's remark).

BMZ, O. V. Shumilov: "When we first came to Ukrqiprommez they agreed with us that the plan lacks a number of positions which are necessary according to the technological charts and technical safety rules, for example, heating furnace operators and a senior engineer for repair of cranes. But then Ukrqiprommez refused to change anything and advised that we find the necessary extra personnel in our own staff. And so we are looking and patching up holes until we get a chance to write

technological instructions, because each time new gaps appear in the organizational structure and the positions that have been missed make themselves evident."

All the mistakes and omissions in the formation of the organizational-management structure of the miniplants only confirm a truth that has long been known. It is necessary to have a scientific approach to the creation of enterprises and a comprehensive solution to problems of organization and management in the very earliest stage—the stage of the development of the plan.

Taking Wishes for Reality

But the consequences caused by omissions in the technical and economic substantiation of the plans of the miniplants turned out to be especially severe. This is what the chief of the planning and economics division of the Soyuzmetallurgprom VPO, N. Kh. Mustafin, had to say about this: the plan was pushed up to the normative level of return. What was desired was passed off as being real. The plants had to have high profitability at any cost. What was this cost? Say, through additional payments. It was planned to produce progressive kinds of rolled metal with additional payments of up to 50 rubles per ton at the BMZ and 43 rubles at the MMZ. But what were these additional payments? They were for the delivery of small batches of products—something that is very difficult for large metallurgical enterprises, and here they were quite justified. They were also for producing rolled metal without wastes—measured to the length ordered by the consumer, for treatment with argon, thermal hardening, and so forth. Actually the additional payments amount to only 11.7-11.8 rubles per ton, and some of these are disputed by the consumers.

We have in front of us a curious document—a letter from the chief of the heavy industry division of the State Price Committee to the Ministry of Ferrous Metallurgy and the BMZ: "The division of heavy industry is drawing the attention of the USSR Ministry of Ferrous Metallurgy to the violation of state price discipline by the Belorussian Metallurgical Plant, which, when settling accounts with the Orsha Selstroy Plant for Reinforced Concrete Items without the consumer's agreement is unjustifiably charging the following additional payment...."

"At the same time we are informing you that, in order to eliminate the differences with the consumer, it is necessary to create normal conditions for the sale of metal products of improved quality. The basis for this could be the creation of special technical specifications for metal products with improved quality whose requirements the consumer can include when designing the products it produces...."

One asks where the State Price Committee was earlier? Why did it not insist earlier on the development of special technical specifications for the products of miniplants. For the question of prices did not arise all of a sudden, not after the letter from the director of the Orsha Plant.

The deputy minister of ferrous metallurgy, A. A. Kugushin, who at that time was also chief of the Soyuzmetallurgprom VPO as early as 4 years ago discussed the fact that the orientation of the Ministry of Ferrous Metallurgy and the gosplans of the Belorussian SSR and the Moldavian SSR toward specialization of miniplants did not coincide. The republics wish to receive from them ordinary metal for daily needs. But the Ministry of Ferrous Metallurgy thinks that the modern technological process for steel smelting with possibilities of processing metal outside the furnace makes it possible to produce high-quality products.

At that time the Ministry of Ferrous Metallurgy should have taken all necessary measures for developing a unified approach with its planning institute, the planning commissions of the republic and the state price committee for specialization of plants and the prices of their products. The tardiness in solving the problem placed the new enterprises in a difficult economic position.

Now both plants have reached profitability, although even they would not call themselves stable. The level of profit is much lower than what is necessary in order to observe the normative time periods for repayment. According to calculations of the chief of the planning and economics division of the MMZ, Ye. P. Matyushenko, the maximum possible profit at any time in the future will be 20-25 million rubles a year (and in the first quarter of 1987 the first 100,000 rubles of profit were received), while in order to reach a point of recouping expenditures in the normative period of 8.2 years it would be necessary to receive 38 million rubles in profit each year. Throughout the complex of the Far Eastern miniplant losses are so great that they put Amurstal, which does not have a high profit level to begin with, among the ranks of the enterprises operating at a loss when it was accepted as part of the DMZ.

From the standpoint of the subbranch, Soyuzmetallurgprom, which includes such gigantic combines as Magnitka, Zapsib, the Lipetsk, Cherepovets and others, compact plants are nothing but a bother: there is a small amount of output and a large amount of troubles. The territorial agencies are not enthusiastic about their new enterprises either: on the one hand, the products are not in a profile, and, on the other, they are not even very needed because the metal was delivered previously and they could still get it in the republic today. Soyuzmetal of the USSR Gosnab is giving the newcomers orders for the least expensive products, on which they will not get very rich. At the same time everyone on whom the destiny and future of the miniplants depend are forgetting about the most important thing—national economic advantage.

And there is no doubt about the national economic advantage in the future. Even today the output per one worker at the MMZ and BMZ is almost 1.5 times greater than at analogous electric steel-smelting enterprises that

are larger. Even now secondary metal resources are utilized more efficiently and shipments of the same cargo going in opposite directions at the same time have been reduced, although one gets the impression that Soyuzglavmetal and the Ministry of Ferrous Metallurgy even try to have this effect not be so significant, and are constantly planning the delivery of products from the most Western plants right up to the Urals and beyond.

It is necessary to take the position of the state in approaching the consideration of the first experiment in the creation of miniplants and their further development.

Footnotes

1. EKO, 1974, No 4; 1978, No 6; 1979, No 7; 1983, No 4.

2. Myrtsyomov, A. F., "Miniplants in Ferrous Metallurgy," EKO, 1979, No 7.

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Problems of Miniplant Construction Discussed
18200012h Novosibirsk EKONOMIKA I ORGANIZATSIYA PROMYSHLENNOGO PROIZVODSTVA (EKO) in Russian No 10, Oct 87 pp 136-144

[Article by Ye. A. Kudashov, chief engineer of the Planning and Technological Institute of the Minvoststroy (Moscow): "Miniplant—Maxiconfusion"]

[Text] In January 1981 construction was started on a metallurgical plant in the city of Komsomolsk-na-Amur, one of the three miniplants being constructed in the country. The first section of the plant—the "steel" complex—has already been constructed and there is a need to look back and critically evaluate what has been done so that the example from this specific construction site can reveal the unsolved problems, which must be solved in order to change over to the intensive path of the utilization of capital investments.

Let us begin with the plan. The general contractor—Sibgiprometz—to his credit has not delayed the builders and has produced the documentation on time and completely, and it would seem that it is of good quality. But the general and partial indicators of the plant that were included in the stage of planning were significantly lower than those of an analogous enterprise which was being constructed almost simultaneously in the city of Zhlobin in the Belorussian SSR by the Austrian firm Fest-Alpine.

The area of the construction site for the basic shops of the Far Eastern plant—the steel-smelting and steel-rolling shops—are larger by factors of 1.8 and 2.2, respectively; the masses of the metal structures are greater by a factor of 1.75 and 1.5; and the proportional indicators of production area per 1 ton of products produced—by a factor of 2.2 and 3.5, respectively.

It would be wrong to make a superficial comparison of the indicators; it is necessary to take into account the differences, for example, in natural and climatic conditions. The increased snow and wind loads make it necessary for the framework of the buildings to be heavier. While in Belorussia the plant was constructed "in an open field," the Far Eastern plant was included in the organism of the existing Amurstal Plant, and a number of its external production facilities were of general plant significance, which required increasing their capacities.

But why, for instance, is the height of the steel-smelting shop at the plant in Belorussia 3 meters lower and that of the rolling shop 4 meters lower than at the Far Eastern plant? Why was the roof of the rolling shop in Zhlobin designed on an industrial basis using stamped planking while in the Far East they used the traditional rubberoid? Why was it necessary for the Far Eastern plant to create a division costing many millions for slag-forming and ferrous alloys with an immense feed line while in Belorussia they made do with significantly simplified technology? Finally, the technology for transporting the raw material by automotive transportation which was adopted by the Austrian firm made it possible to bring its processing as close as possible to the steel-smelting shop and refrain from the complicated rail system of shipments.

In the responses to these "whys" and "wherefores," in our opinion, lie the main reasons for the shortcomings in the design solutions. Thus the reduced sizes of equipment with the same capacity made it possible to reduce the height of the production buildings of the Zhlobin Plant. Because of the better system of gas purification (the degree of purification is up to 95 percent) it was possible to safely use metal items in the roof design. If one adds to this a number of progressive design solutions and the application of highly durable alloy steels one can see quite clearly the shift in the point of evaluation that can be called technical imperfection of the design solutions that were adopted.

In the stage of engineering preparation and in the process of construction of the Far Eastern plant, they used progressive solutions for organization and technology: the group-by-group method of completing jobs, conveyor-block installation of the metal structure rolling shop, sheet-by-sheet installation of the walls, extensive utilization of sets of concrete-laying equipment, standard types of flooring, normed sets of equipment, means of minor mechanization and mechanized instruments, and so forth. It was intended for this work to be done under an

all-encompassing brigade contract using progressive forms of payment for labor and with a high level of engineering support for construction and management. The construction project was included on the list of facilities of exemplary model construction and it was suggested that advanced experience be tried out here so that it could be extensively introduced subsequently.

They managed to accomplish some of what was intended and this in and of itself, under the conditions of the distance of the construction site and the difficult natural and climatic conditions, is an achievement for the builders and installers. The collective of the general contracting subdivision—the "Komsomolskmetallurgstroy" Trust—by the end of the third year of its existence was assimilating more than 9 million rubles a month under the general contract—and not a single other Far Eastern construction site could boast such rates. And the first section was released on time. But still a critical analysis is necessary in order to reveal the general problems inherent in the entire construction complex and disclose the widespread "sore spots" and earmark ways of "treating" them.

Let us begin with the implementation of the organizational and technical decisions. As we know, conveyor assembly and installation of metal structures in large blocks promises all kinds of advantages. These include a significant increase in labor productivity (up to 30-40 percent) as a result of moving many operations from the top of the buildings to the ground, improving the quality of work that is done because of the stationery conditions for carrying it out, improving working conditions, and many other things. There are also many possibilities for the introduction of the all-encompassing brigade contract. But nonetheless the conveyor did not work—the time period for installing the roof on the rolling shop was not reduced, and, moreover, almost all the work was done essentially on the conveyor.

Sheet assembly of walls is an incredible discovery on the technical plane. It is dictated, in the first place, by the inadequate quantity of wall panels of the "sandwich" type and, in the second place, by the fact that the latter cannot be used anywhere because of fire safety specifications. But the sheet installation was not introduced either, which led to irreparable losses of time and delayed the work on the rolling mill on a broad front by at least a half year.

One could continue the list of lost opportunities, but it is much more important to give the general reasons for them that stand on the path of introducing advanced methods of organization and the achievements of scientific and technical progress into the practice of construction.

Why is management practice so passive in realizing the innovations proposed by science and technology? First of all because the plan for introducing new technical equipment and the mechanism that stimulates support

for it exist in and of themselves, and the production activity with its results and the mechanism for bonuses also exist in and of themselves. And the plans are not coordinated among the performers of the work—the organization of the USSR Minvostokstroy and Minmontazhspetsstroy. This is actually proved by the following figures: the calculated volume of payment of bonuses for new technical equipment in the Komsomolskmetallurgstroy Trust amounted to only 0.1 percent of the wage fund; hardly a single one of the subcontracting organizations of the USSR Minmontazhspetsstroy, not to mention organizations of other departments, head such assignments for new technical equipment as the general contracting organization did. How can one calculate their actual success when the incentives for the overall job were extremely limited, and a number of participants were not even included on the overall list for incentives? For such measures, for example, as conveyor-block installation, the group method of completing jobs, and the all-encompassing brigade contract are based on principles of unification and temporary interbranch integration.

Moreover, there is no connection between the fulfillment of the plan for new technical equipment and the indicators of the work of the construction organization. Nobody is surprised any more when an organization that regularly fulfills the plans for new technical equipment can with equal regularity fail to fulfill the technical and economic indicators set for it and vice versa. Let us trace this at the level of territorial main construction administrations. For example, Glavvladvostokstroy, which in 1985 had the highest indicators for fulfillment of the plan for new technical equipment, did not fulfill the assignment for labor productivity and allowed the cost of construction and installation work to increase by a sum of more than 4 million rubles; at the same time Glavkamchatskstroy, which is in last place in terms of fulfillment of the plan for new technical equipment among all the territorial main administrations of the ministry, successfully fulfilled the established technical and economic indicators.

It would be too simplistic to explain this merely by the quantitative aspect of the plan and it would be naive to think that improving the formation of the plan for new technical equipment would inevitably lead to the fulfillment of the planned indicators. Generally speaking, this can be achieved if the higher organization "takes everything into account" and it has everything necessary to provide for this plan. But the fact is that somebody must calculate, plan, and provide, while at the same time any system must have a certain degree of self-regulation. And here an extremely important role is assigned to the collective, whose influence on the formation of this indicator today, as was shown above, is insignificant.

For the sake of fairness one should note that far from the least important factor in the interruptions is the poor engineering support for construction and the unsatisfactory level of material and technical supply that is related

to it. The builders are told: "You have everything you need to fulfill the plan," but in practice this includes lengthy periods of waiting for the delivery of metal or pipes, the necessary panels, and so forth. In terms of "gross output" the calculation is correct, but we do not receive what we need when we need it.

Well, and what about stimulation for labor, particularly advanced bonuses? The overall calculated sum of advanced bonuses for the "steel" complex as a whole amounted to a fairly significant figure—1.16 million rubles, including 357,000 rubles transferred by the client to the account of the general contracting trust, of which 260,000 rubles had been spent by the time the construction was completed. The majority of this money—220,000 rubles—was used for bonuses for workers of the general contracting organization.

How could it happen that by the time of the completion of the first section only 30.5 percent of the advanced bonus money had been transferred, and only the "advance" from the advance equal to 22.5 percent of the sum had been used for bonuses, that is, the bonus effect had been reduced to one-fifth of the initial amount? In each case the client is the one who saves. This is simple to explain: when the facility for which money has been advanced is not introduced on time the builders and installers forfeit the right to receive at least the initial sum, and if there is a second delay they forfeit the entire sum of the bonus. In this case the "guardian" of state interests has "saved." If the facility has been introduced by the established deadline all the bonus, including the advance, will be paid and there are no complaints against the client either. But this mechanism for influencing the startup of capacities has no economic influence on the client—he does not receive an advance and if the startup is delayed by his fault he will be penalized only through measures of a noneconomic nature, and the blame is shifted at best to the realm of pangs of conscience.

The construction bank could intervene here—after all, it protects state interest, which means to have the facility started up by the established deadline. But it intervenes only in another area. It is no wonder that the sad joke is common among construction workers: "It is simpler to build and release a facility than to fill out the documentation for a bonus for it." Indeed, filling out the documentation is an excessively lengthy procedure. And why not? After all, if the facility is released on time there is a savings, and if it is not anyone may bear responsibility, but not the bank workers. And here we are speaking not about a specific client in the construction bank, but about a generally imperfect mechanism for using economic stimuli. This phenomenon is typical of many construction projects.

Let us trace the influence of the advance bonus in the temporal cross-section. Figures show that a five-fold reduction of the initial bonus causes a fatal transformation in terms of time. When the work is accelerated and the system of organization becomes more complicated in

the final stages (prestartup and startup periods) the bonuses are sharply reduced: for stimulating the intensiveness of work—by a factor of 2.5, and for stimulating the workers—by a factor of 1.5.

The mandatory regulation of the ratio between workers and engineering and technical personnel led, in the final analysis, to an overall average amount of advance bonuses that was more than twice as high for engineering and technical personnel as it was for the workers, and as a result of the natural desire to stimulate the maximum possible number of jobs, the overall minimum amount of bonuses was 10-15 rubles per person; bonuses for workers amounted to only 9.8 percent of the wage funds. If one adds that, according to some strange logic, no bonuses are given to workers who work on the construction sites for the automotive bases and administrations for mechanization, and plants for construction materials and reinforced concrete items, which are direct participants in the construction, and the fact that the bonuses divided up among the participants in construction without taking into account the labor-intensiveness of the work, based only on the volumes and the output achieved, the complete groundlessness of the existing system of advanced bonuses becomes obvious.

The culmination point, when all the shortcomings of construction production are revealed, is the stage of the intermediate transfer of work from one performer to another, the release of the facility for installation or for other kinds of work. At conferences at various levels a large amount of time is wasted on endless discussions about the time periods for the performance of work, but the results of the so-called engineering preparation amount to nothing. Especially heated battles take place in the stages of release of construction facilities and design elements to installation organizations of the USSR Minmontazhspetsstroy. The fairly widespread attempt to explain this by the low level of discipline and efficiency is too simple. There is a deeply ingrained practice of arbitrarily designating deadlines, and not only at the directive level. For this reason, up to 70-80 percent of the initial deadlines are changed, and certain decisions are changed many times or are not implemented at all.

Certain observations at a specific construction site make it possible to draw the conclusion that the mechanism of socialist management, from the standpoint of its influence on scientific and technical progress, operates with a great deal of tugging or else it does not operate at all. Thus the criteria for evaluating the work of a construction organization are not coordinated with the indicators of the plan for the introduction of new technical equipment, and no system of legal acts has been created that regulates the relations between the participants in the construction process concerning this range of problems. Material incentives are not directed toward intensification of construction production and the introduction of the achievements of scientific and technical progress into construction practice. In a word, no system has been

created for organizational, economic, legal and other measures for introducing new technical equipment into construction production and there are no reliable levers that make it possible to radically change the situation in capital construction.

What follows from this?

It would be a mistake to think that increasing the effectiveness of construction depends only on improving the economic mechanism for management. Even today it is possible to introduce reserves for acceleration, the kind of acceleration for which the time is objectively right, in whose direction the path was earmarked by the development of our economy through the decisions of the 27th CPSU Congress. Thus construction has always been hampered because of the lack of reinforced concrete items, while at warehouses of the plants and of the Komsomolskmetallurgstroy Trust itself reinforced concrete items have literally been broken apart, and at the point of completion of this first stage more than 10,000 reinforced concrete structures have been left over, and if they had been used there could not have been any shortage.

The staff created for the startup complex did not fulfill its direct function—it did not provide for effective management of the construction project. All of its activity amounted to gathering operational information for making decisions at a meeting of the staff, which was headed by none other than the chief of the main administration, and the chiefs of the subcomplexes, who had no real power (incidentally, in rank they were no less than deputy managers of the trust), at these meetings were transformed into "whipping boys." At best they explained in detail the reasons for the latest failures to meet the repeatedly changed deadlines. And if the "brain potential" of the many experienced production workers were used and engineering work had been organized, they would not have had these endless conferences on the various projects and daily 2-3-hour sessions, whose efficiency factor, if the truth were told, has no effect on the expenditures of engineering labor. In just one quarter about 22,000 man-hours were wasted on this unproductive activity, that is, about 30 managers spent all of their work day there just clarifying interrelations, and in no way engaged in production.

And when a job is poorly organized it is necessary to constantly make adjustments, which is what happened with the Far Eastern construction project. Literally 2-3 months before the completion of the work fresh forces arrived from other construction and installation subdivisions—from Khabarovsk and Amursk—and they were to "fill in the gaps" from the planning omissions. What kind of engineering preparation can there be for these organizations if they have come to work without any documentation? What kind of efficient organization can there be if 2-3 weeks before the startup of the steel-smelting facility one could hear discussions about who was responsible for starting up this facility? It is not

necessary to do very complicated economic calculations in order to assert that this "cavalry attack" cost 35-40 percent of the lost productivity.

From the economic standpoint it is difficult to explain enlisting other territorial main administrations of the ministry to work on the construction of the plant except, perhaps, for Glavvladivostokstroy, the supplier of reinforced concrete for the engineering facility. But builders from Yakutsk, Magadan, Petropavlovsk-Kamchatskiy and Sakhalin received assignments and...resources of Glavdalstroy. Here it is not simply a matter of finding work in other places and moving the ruble and that these workers had rubles that "went farther" by a factor of 2.5-3, but that the main administrations enlisted by the ministry and responsible to it were outside the jurisdiction of the general contracting trust: "The ministry gave the order and it will deal with you." It is no wonder that the first deputy minister was in a hopeless situation in the final preplanning period.

Thus we shall soon reach a point where only the ministers are capable of handling the most important construction projects. We shall not focus attention on the ethical aspect of the matter, for apparently it has been expedient to enlist human resources who are the closest and the "cheapest": after all, Glavdalstroy performs an annual volume of 325 million rubles' worth of work.

The times of getting things done at any price have passed and the role of the human factor is in evidence in any specific production situation, whether it be decision-making, the realization of a technical innovation, prompt payment of bonuses, or the organization of engineering preparation. While learning the bitter lessons from yesterday we must draw conclusions from them.

We are awaiting these conclusions from the USSR Gosstroy.

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Roundtable Discussion on Progress Envisioned
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[Article by Ye. M. Mayburd, chief specialist of the Mosproyekt-3 Institute of GlavAPU of the Moscow Gorispolkom (Moscow) and L. N. Myasnikov, deputy chief engineer of the plant of ZhBK No 9 (Cheboksary): "Forward Movement or Tug of War?"; first three paragraphs EKO introduction]

[Text] How does one achieve acceleration of scientific and technical progress in the system of: NIOKR [scientific research and experimental design work]—plant—construction project (the "round table" is led by a specialist in system analysis).

The intensification of management and the inclusion of scientific and technical progress at a maximum speed presupposes a significant change in the system of control of the economy. The problems here are generally known, but it is fairly difficult to solve them in practice. A comprehensive consideration of them makes it possible to see much in a new light. This is what is suggested by the authors of the material published below.

The branch that has been selected as an illustration in and of itself can hardly be considered a key promoter of scientific and technical progress, but it largely determines the state of affairs today in capital construction, which, in turn, undoubtedly influences the acceleration of scientific and technical progress in the national economy as a whole. Even more important is the fact that problems typical of this narrow sphere of scientific and technical progress are equally crucial for many other branches of the national economy. The significance of a comprehensive, systematic approach to the consideration of these problems goes far beyond the framework of the specific example.

Leader: There is no doubt that everyone in attendance shares the conviction that it is necessary to accelerate scientific and technical progress in construction. But still we are a long ways from the demands of the time, although a good deal actually has been done and continues to be done.

The construction product goes through four sequential basic stages: design, planning, plant manufacture, and construction and installation work (the application of the designs and the materials). We have gathered at our table today representatives of all links in this chain. Our goal is to discuss the problem comprehensively.

Designer: We are at the very beginning. We see our task as making each new generation of designs more economical with the observance of the requirements of technology in production and the application of the design. These goals are achieved by various paths: these include improvement of methods of calculation and principles of design, and the application of high-grade cements and highly durable equipment. I will not say that everything is all right with us, but our section is not the place to look for the "bottlenecks."

For instance, 3-5 years after the introduction of the new series of designs, construction continues using the old (sometimes abolished) series. Industry is not efficient enough and is in no hurry to assimilate the new designs.

Manufacturer: The peculiarity for us is that we are under the jurisdiction of construction departments. We work only according to direct orders from construction and installation trusts and associations. Whatever construction site requests these items, we must send them, even if these models are "obsolete" and have been abolished.

Builder: We build according to the plans we have at our disposal by the time the construction begins. Whatever "generation" of design they envision, that is the one we order. As a rule, we have no choice.

Planner: It is not only our duty to use the most economical design, but it is also in our interest, because there are fewer complaints during expert evaluation. But anybody who thinks we have a free choice is mistaken. When developing a new plan, just as we have to use what is standard for local conditions, we must keep in mind the capabilities of the local construction materials industry.

Very frequently it is impossible to introduce the latest design developments into the plans simply because the manufacturer plant is not prepared for this.

Leader: The plant is not prepared for producing new design because there were no orders. There were no orders because the builders did not have the right plans. They did not have the right plans because the plant was not prepared for producing the new designs! A closed circle in which there is no room for technical progress....

Fortunately, this is only a one-sided elucidation of the situation. It describes only the technological ties, and quite formal ones. Nonetheless, this kind of a beginning for the conversation is also useful. Very frequently the administrators and executives refer to this situation to explain why they fall below the required level of scientific and technical progress. In the absence of representatives of other units, these explanations work—after all, it is not easy to establish how substantiated they are. But today we have a "round table" which will make it possible to view the entire cycle of scientific and technical progress. Let us move from technology to economics.

Economist: For the first approximation this aspect can be approached in two ways. One group of issues has to do with material incentives for the workers to create and introduce new technical equipment. The second group has to do with the connection between the introduction of new technical equipment and the cost accounting interests of the enterprises and organizations.

I shall begin with the first. The goal of economic incentives is to create and maintain the personal material responsibility of workers, engineering and technical personnel, and managers of economic units in the acceleration of scientific and technical progress. This work has been under way for a long time, but in recent years it has been stepped up and a number of new provisions have been adopted. This is being done in all units in parallel, taking into account the peculiarities of the labor and technology in each unit.

Before proceeding further it seems that it would be expedient to see how the incentives look in each unit. We know that everywhere there is (should be) a bonus fund

for the creation and introduction of new technical equipment. If a new design is included in the plan for the introduction of new technical equipment, it is possible to claim a bonus. But all this, as it were, is theory. And what is the practice?

Builder: The plan for new technical equipment is drawn up once a year. At the end of the year we settle our accounts and then it is possible...to begin to fill out the documentation for bonuses. This means gathering all kinds of references, filling out multifaceted acts and protocols, gathering signatures, correspondence, going through all the official levels, informal "pushing through," and so forth. Most frequently the ones who have to do this are the ones who have a personal interest, that is, the production workers themselves, and this takes time away from their basic work. A minimum of 2 years pass from the time the decision is made to introduce something, and sometimes even more. During this time new objects appear and forces are regrouped, somebody is fired, somebody else loses a certain paper, somebody has a falling out with somebody else and cannot obtain the necessary signature or his bonus is "cut," or else it is taken away altogether. To put it briefly, a good deal of water flows under the bridge before the bonus is paid (if it is paid), and the person who receives it is frequently an entirely different person from the one who was active in the introduction of the given measure.

Moreover, for a single object the bonus sums are usually not very much (20-40 rubles per person) because of the small volume of introduction and the large number of recipients. Is it worth it? It turns out that at the level of the section or construction site the instrument of economic incentive has practically no effect. It is simpler and more advantageous to work on streamlining. Although the percentage of remuneration (from the amount of the economic effect) is less here, the receipt of the bonus is guaranteed to be sooner and, moreover, it is not conditioned by the planning sequence, it is simpler to document, and it depends less on the higher levels. I think that approximately the same thing is to be observed in other links of our chain....

Voices: Right.... That is so.... Just the same....

Leader: But there should also be other incentives.... For instance, when applying more economical designs you lower the production cost of construction—which is a direct advantage to the organization and the state. Profit increases.

Builder: That is the way it is, but not quite. The production cost decreases, this is true—for about half of it is composed of material expenditures, but the lion's share of these are designs. But if in the next project the plan envisions less expensive designs than in the preceding one, it is not only the production cost that decreases, but also the estimated cost. Consequently, profit does not increase, but declines. The volume of construction and

installation work will decrease (for the same amount of space being introduced), as will the output (with the same labor expenditures!) and the wage fund. But the work is the same....

Voice: You'd have many other reserves....

Builder: You want us to mobilize other reserves just in order to "cover" the cost accounting damage from the introduction of new designs? The reserves will be utilized, but the "labor productivity" (output) will not increase, and the wages will be the same for more intensive work.

Economist: But if the prepared plan is reworked to include the new designs without recalculating the estimate?

Builder: That is another matter.

Planner: That happens in two cases. Either the given plan is clearly obsolete and the items that are included in it are no longer produced or the reworking of the plan is done as an experiment. In the former case we are speaking not about the introduction of something new, but about the application of something "traditional" instead of something that does not exist. Financial benefits and special incentives have been established for the latter case—increments to estimated prices, bonus funds, additional points in the socialist competition....

Leader: More favorable conditions are probably created for an experimental project, is this not true?

Builder: Yes, but there is nothing of the kind under normal conditions....

Economist: "Easier" conditions, as you said, were invented precisely in order to compensate for the cost accounting loss that was discussed a minute ago....

Leader: But there is no compensation for this harm when changing over from the experiment to mass introduction. It is precisely here that the complete economic effect from scientific and technical progress should be manifested, but it seems that it is here that the payment mechanism creates an obstacle....

Economist: That is the way it was until recently. When we introduced the formula for the contractual price we created an anticost mechanism.¹ In particular, after the establishment of a contractual price for the project, a reduction in the cost of the designs increases the profit balance of the builder.

Builder: Yes, but that is—"after." The contractual price also appears "after"—the plan and the estimate are completed. We have already mentioned the cases in which prepared plans are reworked, and here nothing has changed. If new designs are introduced while the plan is being developed, the contractual price itself becomes

lower than with the old designs. Here also nothing has changed, and it cannot change, which means that it will come out of our pocket as before.

Leader: Briefly, under current conditions technical progress from the standpoint of the builders means a little fatter and a little more expensive (general laughter). To be sure, the builders say that they use what they are given. But what is the situation in the place where the material comes from?

Manufacturer: It is that same "gross output" under the name of "commodity output," that same "production" under the name of "labor productivity" plus the indicator of the volume of output in cubic meters, which suffers from the "fine" new designs as much as the two preceding ones do. One gets less cubic meters from the same quantity of items. It is necessary to increase actual labor productivity just so the indicators of "output" and cubic meters of output will stay at the previous level.

Economist: Just a minute! Not so long ago we suggested a system for changing prices: increments to the price for new designs and discounts from the price of outdated ones. We had in mind contributing to your cost-accounting interests.

Manufacturer: Here again you forget that we work only on orders. Let the builder tell you what these increments and discounts mean for him.

Builder: This is very simple. We must pay the plant more for new designs than we receive according to the estimate or the contractual price. This means that it is a direct loss for us. Conversely, when ordering old (discounted) designs, we receive a savings in the amount of the discount, that is, pure profit. This is technical progress from the standpoint of the economists (audience becomes livelier, laughter).

Economist: In order to cover expenditures on the development and introduction of new technical equipment, you are now permitted to form 5 percent reserves: from the annual wage fund and profit left at your disposal.

Builder: It will be necessary to work another year or two in order to see how these things behave in practice, for example, in our relations with the Sroybank. Now one can say that the aforementioned measure is directed not toward the elimination of cost accounting damage, but toward reimbursement for it. But we do not know how complete this reimbursement will be in all cases. With all of that, the aforementioned innovation could still make it easier for us to introduce new equipment, machines and technologies. Do you want for us to waste this reserve on increments to the price for new designs or for "making up the fulfillment" of the plan in rubles....

Economist: Since August 1986 you have been directly permitted to include in the fund for the development of production planned outlays related to the introduction of progressive planning decisions....

Builder: ...From deductions from savings on funds received as a result of the reduction of the production cost as compared to the contractual price: thank you very much. They promised us, and now they explain to us that all the savings as compared to the contractual price are ours, our funds, our development, our bonuses, finally. But you are saying that we have been permitted to leave part of our fund for the development of production for the ZhBI plant. In my opinion, this is a game of tug of war, and not cost accounting.

Manufacturer: It is time for me to intervene and remind you again that we are a subsidiary production of the Main Construction Administration. They can establish discounts for us, but increments—hardly.

Leader: Price setting can hardly solve all the problems that arise in connection with the task of acceleration.

Manufacturer: The question under discussion is a painful one for us. Every new series of designs is almost a spontaneous disaster.... But we are soldiers. We do whatever we are ordered to do by the commander-builder. We fall in battle.

Designer: You are not such sheep.... How many times has it happened that one plant or another has not accepted our design—and nobody can do anything about it. A great deal depends on you, and you will be able to “defend yourself” if you want to.

Manufacturer: Otherwise the plant really could come to a halt, the plan would not be fulfilled, and so forth. Judge for yourselves.

Our situation with respect to bonuses is like that of the builder. There are differences, but they are not in our favor. For example, according to the general provisions, part of our bonus fund for new technical equipment is centralized with the builder and very frequently it is used for bonuses for workers in construction.

Economist: Does it sometimes happen that the fund is not sufficient to justify filling out documents for bonuses for the introduction of new designs?

Manufacturer: All kinds of things happen. It sometimes happens that it is simpler for us to document the introduction of some new design idea as an efficiency proposal. It is also simpler to document when paying the bonus. And we select the bonus fund for new technical equipment most frequently for measures related to the improvement of equipment and technology. Today the sphere of application of scientific and technical progress

is not being discussed here, but it objectively exists and, honestly speaking, for us it is more important than new designs. Updating fixed capital is our vital and primary concern.

Designer: Is that not why you stubbornly continue to produce series of designs that have long been abolished?

Manufacturer: Not for that reason. Let us figure this out. Say the Gosstroy makes a decision to introduce a new series and replace the preceding one. A time period of up to one year is usually envisioned from that moment until the introduction of the series. But it takes 2-3 months just for the publication of the Gosstroy decision. Usually, without waiting for an order for the designs, we asked the TsITP² to manufacture working blueprints (RCh) for the new items.... This order is filled within 1-2 months if the plan has already been submitted to the TsITP (there have been cases when the TsITP has responded that they have not yet received the plan). Further. The planning of the metal forms takes up to 3 months....

Designer: Permit me to interrupt you. The set of RCh for the new series already contains the RCh for the form-fittings.

Manufacturer: There is some confusion here. Can there be such a thing as a standard plan for decking if its design depends on technology adopted in the plant? The facts are that it is an exception when your decisions are suitable and the rule is still that it is necessary to develop the RCh for the form-fittings on the spot. You are oriented toward the more advanced technology such as the conveyor technology is considered to be. But in practice more frequently the flowline-aggregate technology is applied.

Leader: And so, you have received the blueprints for the fittings....

Manufacturer: “And we get an order for centralized manufacture of it which is included in the plan for the next year since the plan for the current year was finished and approved long ago. It takes about 2 years from the time of the adoption of the decree concerning the startup of a new series until the plant receives the fittings (and no less than a year after the old series has been abolished). But this does not mean that we can begin to produce new items here, even if we want to. There are no orders.

Builder: Of course. Construction has already been started on some of the projects and a complete set of delivery of the abolished designs is required. The new projects that have already been included in the title lists are provided with technological documentation that was developed before the abolition of the old series. Should the plans be reworked? This has already been discussed: there was no way out of the situation. Therefore we order designs according to the plan before the completion of the project.

Manufacturer: And so it turns out that, no matter what, the application of the new designs delays the startup by 3-5 years.

But this is where our problems begin. The plant is forced to produce a double list of items. Anyone who is even slightly familiar with industrial production knows what this means: a double supply of forms, double expenditures on their operation, above-normative readjustment of equipment, confusion of blueprints, losses of technological time, excessive expenditures of labor, down time, rush work, nervous strain....

And what is the situation with the assimilation of new designs? A reduction of their material-intensiveness is achieved because of more modern principles of design and materials with increased durability characteristics. The former means a design complication of the items, of their frames for fittings, and their configurations, and more items and basic components on the products list, grids, fixed parts, and so forth. All this requires technological restructuring, the mastery of new work skills, and the creation of new jobs, and it sometimes increases the labor-intensiveness of individual parts (for example, when changing over from nonstressed to stressed steel the degree of preassembly of steel framework decreases).

Further. Recently there has been a considerable increase in the utilization in the new designs of higher grades of steel and cement, the majority of which are in the category of materials that are in very short supply. Either we are unable to obtain the necessary quantity of these items or they require excessive transportation expenditures (not taken into account in the price list), and frequently both are the case.

Finally. There is something else the designer has failed to say: recently one of the significant factors in economizing on new design series is the reduction of the degree of unification and growth of the number of type sizes in the new series as compared to those that are being replaced. This is a clear tendency which promises only more problems for us: again there will be an increase in the number of forms and additional expenditures, again there will be additional adjustments, losses of time, drops in indicators, and so forth.

Leader: Has anybody brought all these factors together and compared them—savings on materials and other consequences of deunification? Are calculations of the economic effectiveness being done?

Economist: It is hard to tell, but most likely they are not. Insofar as I know, this problem has been poorly developed methodologically. The proposals existing in literature require the kind of initial information which can be obtained only at specific plants through lengthy and painstaking chronometric observations. On the other hand, even with good methods of the corresponding statistics, such a calculation would not produce a reliable

response concerning the actual national economic effectiveness—because of the imperfect prices for steel. Most likely solutions concerning deunification of items in the new series are made in design organizations without the proper economic calculations.

Designer: They tell us: Create designs that are less expensive, less technologically complicated, more economical to produce and apply, and less labor-intensive. But most of all try to save on metal.

Voice: Who says that?

Designer: Our client.

Economist: The USSR construction complex consumes almost one-third of all the steel produced in the country.

Leader: Your client is supposedly utilizing the national economic, systematic approach to the task.

Manufacturer: But up until last year only 2 out of 4 units were directly under the jurisdiction of this client—design and planning. This circumstance affects us even today. Here is one example. A new GOST went into effect recently. Instead of blueprints we now receive (under this name) some kind of guidelines for manufacturing blueprints—a draft that gives only the outlines of the items, and the sizes are entered onto many pages of tables—dozens of typesizes for one such draft. And we cannot give the work brigade a draft and an album full of tables to go along with it! We must provide a blueprint with the sizes for each item. This we must now do for ourselves. But where is the general system approach here?

Without any special decision or even discussion, without any special explanation and, obviously, without a clear idea of the consequences of this measure—the operation of manufacturing blueprints has been shifted to the manufacturing plant. In addition to the fact that for us this means a large amount of work that requires increasing the staff of technical personnel, such a step is questionable from the national economic standpoint. Previously the blueprint of the item was done professionally by the designer all at once for all plants of the country. Now dozens or hundreds of plants do this for themselves, much less professionally, which increases the probability of mistakes. And each mistake in a blueprint means a defect in production.

In passing I wish to mention another “invention” of the new GOST for blueprints. The marking of items has become unbelievably complicated. For example, what is “ZPS 51.180.3.0-1”? This means (if I am not mistaken): “Wall corner panel with breadth of 51 centimeters, height of 180 centimeters, thickness of 3 decimeters, for wind load with the code ‘1’” or “ZKSD 4.33-1.2 Vv-D”? This is a “three-story medium two-console column with a cross-section of 40 x 40 centimeters, for a story height of 3.3 meters, with the same amount of bearing capacity

and the same type of framework as the pillar and the same fixed parts." Bar-shaped crosspieces for example, at one time were marked thus: BP-1, BP-2, and so forth. But now a similar item is given this name: "IPR-38-29.25.22u." Instead of 5-7 symbols there are 16, and sometimes there are up to 20.

Designer: That is very convenient for us. When selecting a design we no longer have to dig through the albums and finding out their parameters—all the information is contained right on the specifications.

Manufacturer: But for us this information is the source of more troubles. Well, what do we get from an indication of the wind load in the code? Or the type of reinforcement of the core of the column? We need not the type but the blueprint for the framework with a selection of the parts in terms of diameters and classes of steel. It is this kind of blueprint that we are not receiving.

The worker needs to know how many pistons to cut and of what diameter, how to weld them into the framework, and how to place this framework in the form. And it makes no difference to the worker of the technical service whether one orders technical documentation for the item BP-3 or for the item IPR-38-29.25.22u. Nor is your information needed by the supply division that fills the order for metal or the sales division that sells the prepared items according to the orders of the builders.

Moreover, when producing the blueprints (which we must do) a good deal of confusion arises. In the neighboring lines of the table there are marks consisting of 15-20 symbols, which differ from one another by only one of these symbols—the figure, the index, the hyphen....

Difficulties have also arisen with the stamping of these marks on the prepared items—sometimes the mark simply will not fit on the side of the item where it is supposed to be located.

It is comical to compare: scientific and technical progress and marking. But the subject of our discussion is what is holding up the acceleration of scientific and technical progress? And this is one of those factors. We production workers have interests that do not always coincide with the interests of those who work at the drawing board. What for some people is convenient is trivial for others, and for us this simply becomes a source of losses of labor and materials....

Builder: ...And also the sorters when they draw up the accompanying documents—with all the consequences that ensue from this: there is an abundance of certain parts, of others there are none altogether, down time, interruptions, material losses. We are not against conveniences for the planer, but we must also think about

conveniences for the builders. Just imagine a brigade leader of assembly workers shouting down from the 12th floor: "Give me a ZKSD4.33-1 and a 2V-v-D!" But what else can he do?

Leader: Are you saying that all this pertains directly to questions of the technological level of new designs?

Manufacturer: Exactly. The technological level. In the manufacture and in the application of the construction site. But it is not so complicated, in my opinion, to develop two markings. One for the planner and another for the manufacturer and builder.

It is not often that we get a chance to speak at the round table and therefore I should like to add something to what has already been said. One series of designs is abolished and another is introduced to replace it. Why not envision tables for replacement—which new item is to be used to replace which old ones? But this is not being done, and we have to do it ourselves again. And here again we come up against the phenomenon of deunification—there is no complete interchangeability of items. This is why the plant, even if it wishes to, cannot begin the assimilation of new items until it obtains the complete orders for the specific buildings (the series is produced for a certain class of assignments, but for all cases: all loads, all climatic conditions, all heights of buildings, and so forth). So 5 years from the startup of a new series to the beginning of its assimilation at the plant is an objective time period.

The aforementioned circumstances are not always kept in mind when designs are updated either. It sometimes happens that we are not able to assimilate a new series and it becomes outdated and is replaced.³ Sometime before accepting a new series for production it is good to think about how quickly it will be abolished. What discounts from the price will there be for "outdated" items and what kind of acceleration of scientific and technical progress can one discuss in this case?

Leader: Perhaps the picture is beginning to come clear. I should like to return to one aspect. Here we have the words "We are soldiers." At the same time the plant is in a position to influence the decision to accept new items for production. Is it not possible to work with this?

Manufacturer: We have certain opportunities to "defend ourselves" from new designs if they promise too many difficulties and, of course, if we are able to see these difficulties in time. Some designs are disadvantageous in production, unprofitable, and nontechnological, while others require infeasible resources and still others can entail violation of the stable work of the plant, underfulfillment of planning assignments, increased labor turnover, and so forth. We can say that at the given time the plant is completely loaded. If the higher levels do not accept our conclusions we can resort to influencing local party agencies who can understand us better, being informed about local conditions.

Leader: And do you frequently resort to such tactics?

Manufacturer: This is not a tactic, but a strict necessity. We must choose for the designers do not know our circumstances.

Economist: What specific criteria does the plant use as guidelines in making such a selection?

Manufacturer: Unfortunately, not the ones that you call "national economic." You do not include in this term such things as maintaining the stability of production at the plant and the quality level of the products, reducing labor turnover, increasing the monetary income of the plant workers without overexpending the wage fund, and so forth. But we cannot fail to take such things into account. We must maintain the plant as an effective unit of the national economy.

Economist: Could you name some positive stimuli that actually work, motivating you to assimilate new items?

Manufacturer: Of course there are incentives that compensate for the negative effect of introducing new designs. First of all, the prestige of the plant of the enterprise that is actively introducing new items is important. Then we enjoy greater confidence when we have failures, and it is easier to obtain funds for materials and monetary funds for bonuses. The plant looks better when the results of socialist competition are summed up. The prestige of the plant management increases in the department and in the local party and soviet agencies, which makes it possible to hope for a certain indulgence when there are production losses or inevitable violations of some of the numerous instructions.

The authority of the advanced enterprise in assimilating new items also includes better conditions for providing plant personnel with housing, kindergartens, day nurseries, passes to health resorts...and, finally, it is easier for such a manager to find another appropriate job if he leaves the position he holds.

Voice: That is a very important stimulus! (The audience becomes livelier.)

Leader: Such phenomena clearly show the inadequate effectiveness of the system of material incentives for new technical equipment. So if new items are introduced, the role of bonuses in this is not very large.... I do not mean that bonuses are not necessary or that material stimulation is an unnecessary thing which should be abolished. On the contrary, bonuses still have to be made into a good instrument for introduction. The forms and methods of material incentives are developed irrespective of other aspects of the introduction of new technical equipment. But in life all these aspects are interconnected. Therefore the bonus now serves not so much as a direct incentive for introduction as a kind of compensation for losses caused by the introduction of new items in other

aspects—for example, the loss of the quarterly bonus because of the overexpenditure of the wage funds because the new items are not advantageous. The lack of coordination of various aspects is also manifested in the fact that these bonuses are difficult to obtain even if the introduction is successful.

Economist: Theoretically, a bonus for the introduction of new technical equipment is a form of redistribution of national income according to the contribution of each individual to its creation. This is one of the manifestations of the general principle of payment according to labor. The question is how this operates. It turns out that the possibility in principle of obtaining a bonus for one measure or another for scientific and technical progress is far from providing for the introduction of the given measure. What should be done? Should the amounts of the remunerations be increased? There might be some point in this for certain cases, but on the whole such a measure is also a kind of "extensive path."

Leader: First we must learn to work with what we already have. Increasing bonuses can lead to a situation, in particular, in which the workers devote more of their working time to the complicated and bothersome matter of filling out documents for bonuses. What then? They will receive only what they have coming to them. The same thing can be achieved by simplifying the policy for documentation. But the main thing remains unchanged: when making a decision concerning introduction, potential bonuses serve, at best, as a counterbalance to the potential harm for the plant collective as a whole.

Manufacturer: Regardless of what the bonuses may be, if there is no metal there are no designs. Metal is also necessary for fittings and for the items themselves. Today there is a marked tendency whereby funds for metal for forms are allotted only for target programs of the ministry. But what about the other new series?

The list of kinds of reinforced concrete items for a large plant can include 50-70 items. Each kind has several subgroups (prestressed or nonprestressed pilings, columns with various cross-sections, wall panels for various purposes, and so forth) and within each subgroup there are dozens of type sizes. Designs are being updated almost continually throughout the entire list, and the target programs encompass only a couple of them at a time (from two to four kinds).

Designer: But is it really impossible to use metal from the forms of items that have been removed from production?

Manufacturer: It is possible. And we do this. And we pay out of our own pockets the fines for scrap metal that has not been turned over. So bonuses for new technical equipment are even very necessary (audience animation).

Leader: No doubt. The principle of material incentives must be fully realized.

The general direction of this work is, first and foremost, for bonuses for new technical equipment to be closely linked to the actual introduction. This means elimination of the time lag between introduction and payment of the bonus and strict observance of the principle of guaranteed bonuses as well as simplification of the policy for filling out and submitting documentation for bonuses and real support of introduction through the bonus fund.

As concerns material and technical supply, this problem is much more complicated than ours. But is it necessary to sit with our hands folded until it is solved? Much can be done even under present conditions.

Manufacturer: If the metal saved from the assimilation of new items were left at our disposal the plant would have a dual advantage: greater freedom to maneuver resources and another incentive for introducing metal-saving items. Now this metal is automatically centralized and we must "fight for it"—go through all the levels proving that we have no resources for introducing progressive designs and put up with all the confusion of material and technical supply. And yet the overall balance of metal consumption does not change.

Leader: The proposal apparently deserves attention. Moreover, it could be verified experimentally. But this is only a particular issue.

The application of materials with improved durability characteristics and the deunification of type sizes—this is a simple task for the designer, but it is extremely complicated for industry and not only for the industry of reinforced concrete items, but also for associated branches that supply material resources. Is there no way of stopping this? Are we today not too attracted to such means and do they not sometimes ease the burden of searching for new means—nonstandard design solutions? Do the new series take full advantage of domestic and foreign patent information?

We can and should place ever greater quality requirements on the associated branches because the designs of the future are unthinkable without modern materials, but the work of the designer is not only new materials, but also new solutions. Judging from the experience of various branches and from the experience of historical development, the path of design solutions contains practically inexhaustible reserves. Increasing the durability characteristics should be used cautiously, in connection with the possibilities of associated branches, and deunification, apparently, is allowable only as an extreme measure.

Designer: You are quite right in saying that the design path is practically unlimited. When the possibilities of further improvement of a design solution are exhausted, design thought generates a principally new solution for

the given element or component or the entire design, which opens up new possibilities of improvement and reveals new reserves for savings.

All this is so, but it is not just our problem. There is no shortage of new inventions, but how are they realized? Today only one party is actually interested in introducing the invention—the inventor himself. The policy for filling out applications is excessively complicated and it is a labor-intensive and lengthy process. The processing of the application (from the time it is submitted until the author's certificate is received) takes a minimum of 2 years and an average of 3-4 years. I am speaking only about inventions whose worth has been proved, and not failures. What next? Information about a new invention is published...and that is it. Its further destiny depends entirely on the organizations that will potentially introduce it or, rather, on the personal initiative of the corresponding workers. And here is the reign of random elements: the envy of the person who wishes he had credit for the invention, ambitions, numerous inconveniences related to the introduction of something new, about which much has already been said, the risk, the inadequate competence, doubts, attempts to enter into coauthorship, and so forth. But let us say that these obstacles have been surmounted. It is good if an invention can be introduced within the framework of existing technology. But the most progressive ideas are frequently distinguished by the fact that they require certain restructuring, for example, the creation of a new machine. Even if this machine automates a labor process that is now being carried out by hand, the matter comes to a halt. Who can make a decision to restructure such a machine?⁴ In the absence of such a machine the invention cannot be realized in a design.

It sometimes happens that an invention in the area of design requires a change in the technology for installation, envisions new installation devices, and so forth. And again there is no one to solve this problem: as long as the previous technology is retained, the invention is not included in the new series, and this being the case, the technology does not change either. There is not a level of management that could make such complicated decisions concerning introduction.

Leader: What about the USSR Gosstroy?

Designer: Perhaps it would be expedient to create under the Gosstroy some council for inventions which would gather all the patent information, analyze it, and organize introduction. I think that if thorough consideration were given to everything that has been patented even in our country during the past 10 years a great many reserves would be revealed for improving the design solutions and the potential economic effect.

Leader: This problem could be resolved within the framework of the overall task of eliminating the negative effect from the introduction of new designs. And so we have the opportunity to become convinced once again

that the problem of the indicators of the operation of an enterprise long ago moved from the category of theoretical issues into the category of crucial practical issues. This pertains, in turn, to the so-called "established" indicators (gross and commodity output, production, output of products in physical terms). One can categorically state that these indicators are severely retarding our common efforts at acceleration of scientific and technical progress. It seems that everyone agrees with this. And yet everything remains as it was.

Builder: There have been many changes, but they basically affect names, and not the essence. For example, according to the new provisions concerning the economic mechanism in construction, the number of annually established indicators for construction and installation organizations is figured as follows: "Volumes of contracting work to be done in keeping with contractual agreements for startup facilities of the planned year and also for technological stages and complexes of work on facilities earmarked for startup in subsequent years." Is this not a euphemism for the "gross output" that everybody has condemned? Look at the formula quoted here and show even one slight distinction from the shorter form: "Annual volume of contracting work"! And yet this indicator has been left as one of those used to evaluate the results of our work and socialist competition for each quarter and for the year.

Manufacturer: the latest measures for improving the economic mechanism in construction do not affect the construction materials and design industry. Of all the aspects of its ties with construction production the only one mentioned is the strengthening of contractual discipline. In what way are we not soldiers? And what is left for us if not that which was called "tactics" above?

Leader: Here we must reproach the economists. They have also designated their "easy path": improvement of bonus systems.

Planner: Under the current five-year plan they have begun to establish for us an annual assignment for economizing on the basic construction materials. This assignment increases each year and the degree of its fulfillment is linked to the amount of our material incentive fund. Of course this link does not help things very much. Regardless of the progressive design development that may exist, we cannot include in the design items that the builder does not receive from industry. And if we do this, the client will not accept this plan and the Stroybank will withhold the cost of its development from our fulfillment of the plan. This is simple.

Leader: A more complicated, but even more crucial problem today—scientific and technical progress and cost accounting—was not given the proper attention for a long time and it is far from being resolved. The latter cannot be put off any longer. This problem should be

solved, as we can see, not "generally" but with a careful accounting for the economic and technological specifics of the work of each link in the chain.

Many questions of control of scientific and technical progress, which are usually resolved not in the "links" individually, should be considered and resolved in concert. An example is the suggestion concerning increments and discounts to prices for reinforced concrete items, but questions like these, along with price setting, include optimal limits of unification of items, the application of material resources that are in short supply, a lack of administrative coordination in the progress of new items, and even the question of standards for blueprints for reinforced concrete items.

Today a decision of the Gosstroy concerning the introduction of new designs is actually mandatory only for the planner, who—precisely because of this state of affairs—is far from always able to implement this decision immediately. This means that improvement of the policy for the progress of new design solutions from the stage of invention to the stage of installation is a separate, but extremely important scientific and practical problem.

Economist: The Gosstroy decision concerning the introduction of new series should be mandatory for those units on which its implementation depends, that is, for the client and the general contractor. Therefore it should envision realistic deadlines.

Manufacturer: Such a decision of the Gosstroy should not only envision prompt manufacturer of metal forms, but also make this mandatory, which means that this contract should be coordinated with the contract for financing the metal for these purposes. The time for the appearance of the new items should be distributed among the various units and stages of introduction.

Economist: The idea of increments to the prices for new items (as long as they are new, say, for the first 3 years after their introduction) is still reasonable, although it has been realized in a one-sided way. We need a mechanism that makes it incumbent on the client and the general contractor to replace outdated items with new ones in the plan—this should become advantageous from the standpoint of their own cost-accounting interests and not vice versa.

Manufacturer: The consequences of using outdated items should be appreciable for the builder and the client; for all links in the chain this should lead to negative consequences.

It would be very useful for everyone if there were periodic publications of lists of all operative series or standard plans for reinforced concrete items. They could

come out, say, in the middle of the year for the beginning of the next one. This would facilitate the expert evaluation of the plans for buildings of the client and the builder (contractor).

Leader: The condition of the technological level is among the issues that must be resolved in complex. This pertains in particular to standards for the manufacturer of blueprints and the marking of items. The working plans by definition include the operation of producing the blueprints—that has been the case and that is the way it should be. We cannot recognize as normal a situation in which this operation is shifted to the manufacturing plants. The GOST for blueprints of designs mentioned here is undoubtedly erroneous.

Designer: One of the possible solutions to the problem of marking, as has already been said here, could be double marking: According to the existing principle for the planner and according to a simplified one for the manufacturer and builder.

Manufacturer: It is enough for us to have 5-7 symbols on the mark.

Leader: Allow me now to generalize our conversation. There are two sides to the problem of accelerating scientific and technical progress in the production of reinforced concrete items. The first is the creation of a model of a design on paper and the second is the realization of this model, that is, the introduction into production. In the area of the creation of progressive models one should keep in mind two goals: economy and technology. Moreover, we understand the latter in the broad sense, including questions of unification and convenience in using the blueprints. Here the main problem is to open up the way as far as possible for the utilization of new design ideas and inventions, having removed everything that impedes this. It is not allowable to have many unrealized useful inventions. It is necessary to eradicate the current idea that the introduction of an invention is the personal affair of the inventor. The business of the inventor is to generate new ideas and technical solutions. We must not waste this most valuable social resource on overcoming all kinds of delays and blind alleys so that barriers and red tape ruin the lives of inventors and impede comprehensive acceleration of scientific and technical progress, not to mention the fact that the enthusiasm of the authors alone will not solve the problem of acceleration. This is a state matter and it should be handled in a statelike way.

Now about the introduction of new designs. Here three stages can be singled out: planning, plant production, and application. We have become convinced that these three stages are linked together by direct and reverse ties. At the same time, in each stage this problem looks different. It is most controllable in planning, but the control levers are not so much in the area of bonus interests for the planners or their administrative responsibility as in the area of the production and application

of new designs. In construction today the problem largely amounts to, grossly speaking, a balance of positive and negative stimuli. The former are represented basically by bonuses and the latter is cost accounting. Let us say frankly that progress is impossible unless we can eliminate the indicator of the volume of work (gross, commodity output and so forth) from the indicators that evaluate the work of construction organizations as well as the indicator of "labor productivity" that is calculated on the basis of this. The question arises: is "gross output" necessary today when the main indicator of the work of construction and installation organizations is the startup of production capacities, objects, and structures? The indicator of the volume of work is necessary for planning capital investments and accounting for their assimilation. But if the startup is planned for the 5-year period with a breakdown for the various years, the volume of work becomes a secondary indicator that is derived from the indicator of startup.

Economist: But then we cannot require that it grow uniformly from year to year and be stable in the various quarters and months, and this means that there will be fluctuations of the wage fund and so forth....

Leader: Precisely. Because the requirement for its stability and uniform growth is in contradiction (generally) with such a goal as acceleration of the startup of capacities and concentration of capital investments. In essence, you want to continue to plan from the level that has been achieved while the schedule for the startup of capacities sets its own rhythm for performing the volumes of work. Yet this schedule, in combination with the normative time periods for the erection of facilities in the plans for the organization of production, puts into your hands a valuable information base for planning the volume of work. There is something with which to replace the "level that has been achieved" as a point of departure and therefore to stick to it now means to manifest sluggishness.

Let us recognize, finally, a simple truth: if the organization observes all the time periods for releasing its product with the proper quality and the plan for the volume of work is still not fulfilled, this still shows poor work not in the given organization but, rather, on the part of the planners. What has been said applies both to the builder and to the manufacturer and to the planner. We have had enough of throwing bad money after good, giving the appearance that the planning figures are always substantiated and correct. Overfulfillment of the plan is just as much a defect in the work of the planners as underfulfillment is.

Specifically, I would formulate it this way:

first, the indicator of the volume of work performed can be left among the planning and accounting indicators;

second, this indicator must be removed from the evaluation indicators thus eliminating such an "incentive" as preference for more expensive work over less expensive work; then the indicator of startup will operate better;

third, the indicator of labor productivity, difficult as it may be, must be linked to the indicator of startup, and not to the indicator of "gross output." It is worth an experiment. Of course, we are speaking about an indicator with which one evaluates the current work of construction and installation collectives. In order to evaluate their work on the scale of the five-year plan, the more so for measurements at the level of the branch and the national economy, the previous indicator (more precisely, the current one) will also be needed in the future.

That pertains to construction. What remains is plant production, where the situation is most complicated of all. In addition to all the analogies with construction, there are also a number of special issues here. The task presents itself in three stages:

- 1) Material and technical supply,
- 2) The influence of scientific and technical progress on the indicators of the planned economic activity,
- 3) Material incentives for participants in introduction.

The stages are arranged in the order of how relatively crucial and significant they are. Without a satisfactory solution to the preceding one, even the best solutions to the subsequent ones will not produce the required effect.

Material and technical supply is the subject for a special and a very large discussion. It is clear that here lies the root to many, many economic problems for each unit of the economy and in all branches. It was important for us to establish that—with the best incentive systems and control indicators—the decisive word in the matter of acceleration frequently goes to material and technical supply. Up to this point many proposals are being developed and decrees are being adopted with the tacit presumption that the problem of material and technical supply has been solved or that it will somehow be solved of its own accord. Yet this is an indispensable constituent part of the overall problem of acceleration.

Such a lever as material incentives for workers to introduce new technical equipment under current conditions cannot exert the expected influence, and it is well-known how formally all of this takes place in the majority of cases.

A different approach is needed in principle, and today there is no doubt precisely which one: the creation of a mechanism for acceleration. It is fairly obvious that to begin with one should eliminate as quickly as possible the competition among evaluating (approved) indicators of the work of one and the same enterprise. If for builders the main indicator is the startup of fixed capital,

for the industry that supplies them the main indicator is prompt and complete delivery to the builders of elements of the objects of their labor. Such indicators as volume of output in money and cubic measurements and also measured on the basis of production should be eliminated from the list of established indicators, being left as planning and reporting indicators. Does the plant work for the order? Today this to is frequently a formality. In reality, such a policy must be created all over again. If there are not enough supplies to fill the order a penalty should be paid. Conversely, if supplies have been provided for a rush order—there should be a bonus. From the builder, for rush work!

Let us ask the USSR Gosstroy to consider this proposal: as an experiment, to introduce in several places a policy of working without evaluation according to indicators of the volume of work and output in rubles. In order for the experiment to be more complete, it should be conducted under various working conditions: in an association KPD (DSK) and outside such an association, under conditions of the collective contract and under traditional conditions, in urban and rural construction and industrial and civil construction.

In order not to nip success in the bud, it is necessary to make the normative of the wage fund (where it exists) long-term—for 2, 3 or even 5 years, depending on the production cycle in each specific case. One can by no means allow fluctuations of this normative among the various quarters (months!), depending on the volumes of work performed if the plan is fulfilled for the startup of capacities, objects, or stages.

Of course the range of issues in such an experiment is much broader than our topic today. For example, it is possible to advance for experimental verification the following hypothesis: (a) the management levels—main administrations, ministry, planning agency—should begin to work harder; (b) the production unit (construction trust, plant for reinforced concrete items) should have easier work; (c) incomplete production and the number of objects under construction at the same time and the time periods for construction reveal a tendency more toward reduction than toward increase (the degree of manifestation of this tendency depends on many factors, particularly material and technical supply).

In such an experiment in each case the entire chain should go into effect or, to begin with, two of its links: the manufacturer and the builder.

We have begun to increasingly to expand the initial subject of our conversation. And this is inevitable: a comprehensive approach to the problem forces us to pay attention not only to the internal structure of the system that is being observed, but also to the structure of "system-environment." But let us return to our chain.

Externally everything looks as though the critical link is planned production of designs. In a certain sense this is so. But a more correct conclusion is that in our four-link chain all links are critical. Each of them has its own problems but the interdependency of the links leads to a situation where the task of each link should be carried out comprehensively. We have been convinced that many of the difficulties today exist only because of the lack of this kind of systematic approach—in the control of scientific and technical progress the link-by-link principle still prevails. There is the widespread unrecognized idea that it is possible to achieve acceleration of scientific and technical progress by acting in each link separately. Great efforts are applied to individual links and frequently without looking at the other links. Today such an idea needs to be changed no less than many methods of management, since with such an approach it will be impossible for the most well-intentioned and most exhaustive measures to work. And they are not working. Even the collective contract—a form that has immense potential possibilities of acceleration—can suffer from a noncomprehensive, link-by-link style of management. But, as we have seen, comprehensiveness consists not only in encompassing all links of the technological chain under a unified principle, but also in a systematic approach to the principle itself, that is, simultaneously accounting for all aspects of management of a given individual link, and this means the entire chain. Other approaches not only do not produce the expected acceleration—which in and of itself should disturb us—but also compromise many good undertakings.

Our meeting has not produced concrete answers to the question of how to accelerate scientific and technical progress in the production of construction designs. There have already been plenty of palliative solutions. But it does not seem that we have spent our time usefully. Before giving answers it is necessary to formulate the questions. Many of them were known even before us. They have been considered, as a rule, in isolation, which we found to be one of the reasons for the lack of a satisfactory solution to them. It seems that we have managed partially to bring these issues into a system and place certain focuses. We have seen that this has made some things look different. For example, we have become convinced that the expenditure mechanism that took form in the past was unusually viable. The numerous efforts at accelerating scientific and technical progress have practically not affected it up to this point. The needs for reporting and accountability, the habits of routine methods of management and daily administrative tutelage (only the most innocent factors have been listed) give harmful indicators the property of "superpermeability," as a result of which they penetrate (sometimes under the guise of expert advice) into the latest draft laws,⁵ decrees, and normative acts. The healthy idea of economic stimulation of scientific and technical progress is degenerating before our very eyes into forced compensation for the retarding effect of a mechanism that continues to do its own, as it were, dirty work.⁶ Attempts to improve cost accounting are transformed

into a kind of tug of war: one person wins under the condition that another loses. At best what we manage to gain with one hand we lose with the other. As a result we are at a standstill.

Thus we confirm one of the main slogans of the day: the task of acceleration requires a decisive restructuring—both in the mechanism for economic management and in the style of our thinking.

Footnotes

1. One of the authors heard this phrase with his own ears in November 1986 at a lecture at the Central Interdepartmental Institute for Increasing the Qualifications of Builders.

2. TsITP—Central Institute for Standard Plans of the USSR Gosstroy—receives all standard plans and distributes them according to orders.

3. Here are some examples from the practice of the Plant for Reinforced Concrete Items No 9 of the Chuvash TUS: Series 460-75 was introduced in 1977, orders began to come in in 1982, it was replaced on 1 July 1983. Series 3.90-3: orders began to come in in 1982 and it was replaced on 1 October 1983.

4. Example: Author's Certificate No 844723, published in the *BYULLETEN IZOBRETENIY* No 25, 1981. It proposes a new principle for indirect reinforcement of columns. Instead of welded wire netting—wire spirals; they are manufactured solid and when fastened to the floor they stand erect. The solution completely eliminates the operation of welding and reduces labor expenditures by a factor of more than 3, and it also reduces the expenditure of metal. A simple machine is envisioned for automatic manufacture of the solid spiral. The invention was not introduced.

5. See, for example, the article by Academician T. Zaslavskaya and Candidate of Economic Sciences V. Yefimov, "Braking the Mechanism of Retardation" in *SOVETSKAYA ROSSIYA* of 24 March 1987.

6. The interesting and useful article by Candidate of Economic Sciences M. V. Lychagin (*EKO*, No 1, 1986), unfortunately does not go beyond the aforementioned framework either, although the author raises the question of the competition of economic incentive.

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Workers Become Health-Conscious

18200012j Novosibirsk *EKONOMIKA I ORGANIZATSIYA PROMYSHLENNOGO PROIZVODSTVA (EKO)* in Russian No 10, Oct 87 pp 208-211

[Article by S. M. Balanovskiy, Omsk Polytechnical Institute: "...The Business of the Workers Themselves"]

[Text] And this is the way it was. Nedezhda F. came to work at her design bureau one day and her co-workers noted over tea, half-joking and half-serious, "What is it with you, Nedezhda, you have begun to fill out somehow one-sidedly...."

"What do you mean? After all, I am beyond 40!"

But then she herself thought about this for a couple of days: "What is surprising is that it is hard to tie my shoes because my belly gets in the way."

And so she became one of those involved in the health group of the plant sports complex. No, not for the sake of health, but in order to keep her figure from spreading out any further. The group exercises three times a week were augmented by a morning program of her own in which she emphasized exercise the stomach muscles. Then it was jogging. With a year her figure became the envy of girls, and men looked at her interestedly as they passed.

But the main effect was that her headaches and extreme fatigue after work disappeared. Nedezhda has not been on the sick list for several years now.

I am deliberately not giving her last name: this is the glorious path of many people. The essence lies elsewhere.

Our society has always had a humane attitude toward those who are suffering and in pain. But this is the only disturbing thing. Some people, because of regular physical training, sports, fitness and self-improvement are never ill and, as a result, are never in the bulletins of temporary disability. Others, while recognizing the advantage both of physical training and of watching their weight, ignore both, and, moreover, they smoke and drink and overeat—and this is a person over 40, whose health has already deteriorated and who has gathered an entire "bouquet" of chronic diseases that are difficult to treat. One cannot rule out cases in which poor heredity is the cause of this. But most frequently the cause lies in us ourselves, in our laziness, our disorderliness, and our undeveloped willpower. The causes are purely psychological.

The sick person receives no pleasure from being ill, and it causes direct harm and loss to our national economy. I am referring to the recently published collection titled "The Health of Each Is the Wealth of All" (Moscow, "Mysl", 1985): when even one person 34-40 years of age loses his ability to work the state sustains a loss of an

average of 39,000-46,000 rubles. In 1958-1978 the average losses from disability per worker amounted to 3.2 percent of the overall supply of work time, which means that each of us each year fails to receive an average of 100 rubles' worth of useful products, and if this is multiplied by 140 million people employed in the national economy?

The reader is disturbed. "We are not indifferent to the interests of the state, but now is it a crime to get sick? After all, a disease does not ask when it can come and visit us." Convincing logic. In the aforementioned collection on p 23 we find a confirmation of this: "As our calculations have shown, on an average during the course of a man's working age he suffers about 30 different illnesses, and each woman suffers 34."

I am over 50 years old. Among my contemporaries are acquaintances, relatives, and co-workers who join in physical exercise, the health group, the running club, and practically none of them are ever ill, and this means that they are never on the sick lists. They are always cheerful, active, and full of joy in life. Others out of spiritual laziness or a lack of will, for there is no other explanation, "strengthen" their health through polyclinics, pharmacies, and sanatoriums. And it is futile! The unexercised, lazy organism frequently lets them down, there is a narrowing of the peripheral blood vessels, a stiffening of the joints, elevated salt content, and diabetes.

I can confirm through many years of my own observations: among sick people there are none and can be none who regularly engage in physical exercise, active tourism, self-training, healthful running, and conditioning.

So where is the social justice?

According to the principle of social security, we pay sick pay to people on sick lists that become longer from year to year, and this is one of the conquests of Soviet power. But yet the rest of us, who are actively fighting for our health, deserve both moral and material encouragement! I suggest that workers from 35 to 40 years of age who have not been on the disability list once except to care for sick children be paid 10 percent in addition to the payments for the results of the year (13th wage), for those aged 41-50 years—about 50 percent, 51-55—up to 20-24 percent, and above 55 years of age, including working pensioners—more than 25 percent. The enterprise's collective could decide this for itself in its collective agreement. The idea is important: physical cultural activity should be encouraged.

And another thing. A number of countries have begun to conduct national beauty contests, for instance, for the title "Miss Cuba" or "Miss America." But what if, based on age norms of the "Ready for Labor and Defense" movement, one were to introduce a competitive element into the physical culture movement? How would you like competition for the title "Miss Health" or "Knight" of the kolkhoz, sovkhoz, rayon, plant, city, and, finally,

republic? Let the entire country have its own heroes and be proud of them and attracted to them, for they have earned this high title not by the size of their waist or bust, but by daily training and running, and they are ahead of their contemporaries in terms of the condition of their health. Then the state could place on a pedestal not only the sportsman who wins international competitions, but the simple worker, the "home" physical culture enthusiast.

I am confident that after a couple of generations people will be walking around perhaps with light bands around their waists. Their torsos will be so physically beautiful. It would be socially embarrassing to have loose, hanging bellies, round shoulders, a narrow chest or fat thighs.... Physical culture in sports will become a constituent element of culture, and morning exercise more desirable and mandatory than morning breakfast.

So let us exert nationwide efforts to approach this desired time and to use the millions of rubles that are now used for paying hospital bills for accomplishments that are more necessary and useful to the people.

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EKO Readers Club Celebrates Anniversary
18200012k Novosibirsk EKONOMIKA I ORGANIZATSIYA PROMYSHLENNOGO PROIZVODSTVA (EKO) in Russian No 10, Oct 87 pp 212-215

[Article by A. V. Chmel, secretary of the Leningrad Club of Friends of EKO: "The Club's First Anniversary"]

[Text] The Club of Friends of EKO on the banks of the Neva in December 1986 celebrated 5 years of work with a conference of readers of the magazine.

The chairman of the club, doctor of technical sciences, professor at the Leningrad Engineering-Economics Institute imeni Palmiro Tolyatti, R. F. Zhukov, in his speech generalized the opinions of many members of the club. It was not without regret that he announced that the subscription to EKO for 1987 in Leningrad had increased by only 1 percent, and in the oblast it had even decreased by 10 copies, while from 1981 through 1986 the number of subscribers increased from 3,700 to 6,800, that is, by a factor of 1.8. R. F. Zhukov listed certain indications that the magazine was paying less attention to the readers: The questionnaire of experts concerning the quality of the materials and their interests began to be conducted once every half year instead of quarterly as before; for the second year the editorial staff has not asked the Leningrad Club (and perhaps others as well) about the dynamics of the subscriptions to the magazine; and the column "Reader and Journal" has practically disappeared, a pleasant exception being the 12th issue

for 1986. It seems that the editorial staff should react more constructively to the direction of the "needle on the compass"—the opinion of the readers concerning publications and rates, their advice and their wishes.

The magazine has clearly become less enthusiastic about active methods of training and it was as though it had forgotten about the existence of business games. But the readers are expecting practical advice and assistance in acquiring skills for performing under the conditions of complicated economic life and the ability "to do things the way they are supposed to be done." After all, the magazine is not called "Theory of the Economics and Organization of Industrial Production" and there are probably not very many pure theoreticians among its more than 160,000 readers. However, an in-depth theoretical interpretation of the crucial problems of real activity using illustrative material is undoubtedly necessary for businessmen.

EKO frequently expresses critical remarks and interesting and constructive proposals that should be realized. The magazine's authority gives it the right to expect and demand a response from the corresponding agencies to those positions which it defends. But the readers, unfortunately, do not receive information about the effectiveness of the magazine's articles.

The Leningrad Club of Friends of EKO offers the editorial staff a certain amount of assistance in this. Probably other clubs as well would be willing to support our suggestion. In particular, members of the club could keep track of certain ideas written about in the magazine. One of them is the idea that technical documentation necessarily should include training and methodological materials for assimilating the new technical equipment which includes a set of situations for adjustment, tuning, eliminating malfunctions, and business games for assimilating new models of products. What is being done in this sphere, what is needed, and who is holding it up and why? It would be good to periodically publish the results that are received along with an analysis in the magazine.

The lead engineer of VPTIenergomash, P. S. Filippov, thinks that it is time for the editors to introduce electronic test processing, which will accelerate the handling of materials. The only illustrated economics journal in the country is not only published at yesterday's printing level, but also has the longest cycle for publication of all the central journals! His other wishes were that EKO would analyze the causes of resistance to restructuring and analyze the failures of economic experiments.

It would be good to activate the dialogue with the readers and, say, create economic practical sessions in which it would first be proposed that concrete problems from daily production practice be resolved, and then the results of the introduction of the best suggestions generated during the course of collective discussions would be published.

A club veteran, a division chief of the oblast planning administration, V. I. Vulf, drew the attention of those in attendance to the fact that a considerable proportion of EKO readers are managers who are extremely in need of advice as to how to make and implement effective management decisions. They also need a discussion of erroneous variants. The magazine cannot stop at elucidating problems of information science and its influence on economic life.

Candidate of Economic Sciences B. A. Gusarov suggested introducing the rubric "Paradoxical Ideas." Are the editors not too strict in rejecting ideas that are not altogether professional (or do not come from professionals) and are they not too determined to make the magazine broadly available for "professional" drabness? There is the proverb: if all the doors are closed to stupidity, how will the truth get in?... Now they have begun to write a good deal about the elections of managers. The readers expect from EKO an in-depth, comprehensive analysis of the methods, experience of past years and experience of other countries, our practice, and the legal aspects of this phenomenon. It would also be good to pay attention to the problem of the elimination of outdated branch management agencies and also the responsibility of the Gosplan, the Goskomtrud, Goskomtsen, and the Ministry of Finance for the decisions that are made.

An EKO author, Candidate of Economic Sciences G. A. Klimentov, discussed how difficult it was for his articles to make their way to the pages of the magazine. Yet one of them, "Getting Away From Robinson" (1986, No 6), according to the results of a questionnaire, was marked as one of the best articles of last year. G. A. Klimentov suggested that the magazine conduct a businesslike discussion of problems of combining self-financing and planned management.

EKO Editor in Chief Academician A. G. Aganbegyan shared with participants in the conference his ideas about the essence of the economic restructuring and ways of realizing it, and he answered many questions.

And so our club is 5 years old. The anniversary conference (incidentally, this is the third one in Leningrad in 5 years) was the 70th meeting of the Leningrad Club of Friends of EKO. Today the club has an emblem which will soon also be a badge. The time and place of the meetings are permanently set: every second and fourth Monday of any month (except for summer vacation) in the comfortable living room of the House of Scientists in Lesnyy at 6:30 pm.

Papers on crucial problems have become a traditional form. After the speaker has finished the opponents can speak. If the subject has stung to the quick (and this is precisely the kind we try to choose), there is a discussion which frequently continues outside the living room and into the fourth Monday. But in the life of the club these fourth Mondays have become days for holding seminars

on business games, the need for which is conditioned by the very nature of the club, which joins together readers who are trying to get things done. Initially this forced us to hold discussions about active training methods, and then it brought about the need to master the methods of game modeling and use them in practice.

The club recommends the best papers-articles for publication in EKO, and they are reworked taking into account the remarks made in the discussion. Such materials have been, for example, the already mentioned article by G. A. Klimentov, "Getting Away From Robinson," the articles by P. S. Filippov, "Awakening the Feeling of a Master" and "Public Opinion—Teeth and Nails," the article by V. V. Volostnyy, "On the Competitive Mechanism of Management," articles by V. G. Ramm, and others. We welcome the decision of the magazine's editorial board when publishing the corresponding material to announce that it was recommended by some Club of Friends of EKO.

The atmosphere of a constructive conversation among like thinkers has become the favorable soil on which a new phenomenon in the life of the club has originated: interested people from other cities who do not have the opportunity for this kind of communication at home have begun to send papers to us and come to participate in their public discussion. Communication in the club is mutually enriching, it sharpens word and deed, it forms an economic world view, and it develops the ability to think in a new way. This is not surprising: for professors and students, general directors and workers, economists and engineers, designers and scientists all think together. Such clubs are very necessary for all of us!

The Leningrad Club appeals to all the other clubs to tell us what they are doing and what is keeping them from working actively, and to make constructive suggestions. It would be good to conduct a questionnaire of the clubs. We have developed the appropriate questionnaire and are ready to take responsibility for processing the results. The editor should take better advantage of the clubs as a powerful means of feedback and the members of the editorial board should visit our meetings more frequently.

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EKO Club Analyzes Subject Matter
*18200121 Novosibirsk EKONOMIKA I
ORGANIZATSIYA PROMYSHLENNOGO
PROIZVODSTVA (EKO) in Russian No 10, Oct 87
pp 215-216*

[Article by V. N. Lazhentsev, chairman of the Syktyvkar EKO Club, and Ts. I. Zilberg, secretary: "News From the EKO Club"]

[Text] Members of the EKO Club (Syktyvkar) at the regular meeting held on 7 April 1987 tried to analyze the magazine's subject matter for 1987. This was done in

order to systematize and utilize the articles in their own work, and also in order to develop proposals and remarks for the magazine's editorial staff.

Many of the articles evoked lively interest and contributed to the discussion of modern problems of economic science and improvement of the economic mechanism. Members of the club supported the ideas of D. M. Kazakevich concerning improvement of consumer prices, G. A. Klimentov concerning measurement of labor productivity, T. I. Zaslavskaya concerning the human factor in economics, V. P. Moskalenko concerning cost accounting interest in high final results, and the articles of a number of other authors as well. Using the materials under the rubric "Management Consulting" they discussed the possibilities of scientific subdivisions of Syktyvkar for organizing consulting firms within the framework of scientific and technical societies. It was decided to conduct an experiment and devote a special meeting of the club to this.

In order to strengthen the constructive, businesslike character of the EKO magazine, it is necessary first of all to answer the question: who establishes the critical articles of the magazine and in what form, and what decisions are being made? This question should pertain not only to problems of current economic activity, management, and planning, but also to economic science itself. Say that an author has revealed the complete absurdity of existing methods of measuring labor productivity. The magazine's editorial board, apparently, should recommend that a specific scientific research organization study this problem and check on its solution right down to the development of methods and instructions.

In the opinion of club members, theory and methodology have become a weak point for the EKO magazine. There are not enough articles that raise problems of the interconnections between economics and sociology, philosophy, geography, technology, and the development of social relations as a whole. It would be desirable to more frequently publish articles concerning the comparison of methods of statistics, planning, and accounting with the real structure of productive forces and production relations.

The magazine does not devote enough attention to the history of economic sciences, the development of foreign economic thought, or retrospective analysis of the course of the implementation of previous reforms and national economic programs that have been adopted. In particular, it would be useful to learn of the actual implementation of the programs for the BAM, the Nonchernozem Zone, the formation of specific TPK's, the fuel and energy complex, and so forth.

One of the essential remarks is that the magazine is quite indifferent to the fate of economists. For a considerable number of them did not have an economic education and those who do are employed in less skilled labor.

Economists of enterprises and organizations and even of planning financial agencies over many years have gotten away from political and economic thinking and lost their taste for analysis and for measuring their own work against the actual course of affairs in production. Consequently, in the magazine it is necessary to publish articles concerning increasing the prestige of the labor not only of technologists and designers, but also of economists, and the main thing—concerning the structure and methods of the daily activity of economic services. It was also noted at the club meeting that the number of subscribers and readers of the magazine in the republic is continuing to grow.

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Economics Satirized in Fairy Tale

*18200012m Novosibirsk EKONOMIKA I
ORGANIZATSIYA PROMYSHLENNOGO
PROIZVODSTVA (EKO) in Russian No 10, Oct 87
pp 217-222*

[Fairy tale by E. K. Nomov (Moscow): "The Axe"]

[Text] Prologue

The ancient village of Toporishchino has long been renowned for the manufacture of axe handles. The peasants made them in the winter—since the village was in the Taiga, next to a deep river. In the spring when the water was high a steamship would come with a buyer who would gather up all the products: according to the research of the local historian, the teacher Toporov, there were between 9,958 and 9,958 axe handles.

After the purges an industrial artel was created in the village, "Our Axe Handle," and years later it was transformed into the Toporishchino Enterprise of Local Industry (TPMP). There were only 10 workers at the TPMP, and, as is the custom, a manager, a bookkeeper, a cashier, and a warehouseman (only four people in AUP). The plan set for the enterprise was difficult: 1,000 axe handles a year at a wholesale price of 0.10 rubles per each. A total of 100 rubles of annual output.

The enterprise was able to fulfill the plan and the axe handle merchants traveled in a steamship to the mainland for the axes that were needed in the economy. But....

Part One

One day the resourceful citizen Boris Lvovich Fint arrived in the village along with the high water. Boris Lvovich brought with him a mandate for the TPMP Administration for 1,000, as was written on the invoice, "metal batching items for axe handles" at a price of 0.50 rubles per unit.

There were eight workers left for manufacturing the axe handles, whom Fint called the procurement shop, and two formed the assembly shop. The number of AUP increased sharply: the director (Fint himself), his two deputies (for production—the head engineer and supply—the head economist), five people in the bookkeeping office with the head bookkeeper in charge, two people in the personnel division, a division for labor and wages consisting of three people, and two (and later four) shift foremen in case there was a possible drinking bout. The total was 19 people, not including the VOKhR.

Since when the boxes of batching items were opened there turned out to be only 900 (it was never explained what happened to the other 100), the plan for producing mechanical cutting instruments (MRU)—as the axes were now called—was set at 900 MRU per year. The wholesale price was established at 1.10 rubles (0.50 for batching items + 0.08 for raw material for the axe handles + 0.10 of basic wages + 0.02 for amortization + 0.36 for shop and general plant expenditures + 0.04 for profit. The total annual volume of output was 990 rubles, and the growth rates as compared to the preceding period were 990 percent. Since Fint had installed somewhere a cast-off intercom with a residual value of 100 rubles which, for the appearance of solidity, gathered dust in a corner of his office, an OPF appeared at the enterprise, and the indicator of the output-capital ratio was also good: 9.9 rubles of output per 1 ruble of OPF. These figures were not the record. There were also reserves....

Part Two

At the suggestion of Boris Lvovich, the local leadership divided the TPMP into two plants: wood processing (Derobde), which was under the jurisdiction of the Ministry of the Timber and Wood Processing Industry, and the Mechanical and Assembly Plant (Mekhobr) which was under the jurisdiction of the Ministry of Heavy Industry.

The former began to produce axe handles with increased comfort (a bent hand grip) at 1.00 rubles per unit and were looking for internal reserves for increasing their output to 910 items a year. The total volume of production amounted to 910 rubles with the same labor resources (eight workers).

Mekhobr also adopted an increased plan of 910 MRU's. Obtaining metal and wooden batching items from the outside through cooperation, it changed over to producing products with improved finishing. On the head of each axe, excuse me, MRU-2, there appeared a gilded inlay. A new galvanizing-finishing shop was created with 10 workers, and their number at Mekhobr increased to 12 people. Because of the OTK, shop and plant personnel, the warehouse service and the special guard for the gilding, the AUP increased to 100 people. Wages also increased in Mekhobr, as provided in the Ministry of Heavy Industry (+ the rayon increment + additional

payments for the harmful conditions of galvanizing work). As a result, the price of the MRU-2 was set at 15 rubles (to be sure, the metal batching items were delivered as before at 0.50 rubles apiece). The annual volume of output now amounted to 13,650 rubles. The growth rate was almost 13.8 (!) at Mekhobr alone, and throughout all of Toporishchenskiy Okrug it was 14.7! Labor productivity increased by a factor of 11.4. To be sure, the OPF also increased to 1,000 rubles, but still the output-capital ratio also improved by 38 percent. Fint sent out victorious reports. But....

Part Tree

Difficulties began, and then—stagnation. Fint—the director of Mekhobr—had spent a good proportion of the raw material on the gilt inlays. The finishing workers and the two best masters of the woodworking plant, who knew the secrets of manufacturing bent axe handles, hit the bottle. The output of MRU-2's decreased to 800. Complaints about quality started to pour in: the axe handles bent in the wrong direction and the inlay did not stand up under even one blow of the head of the axe instead of the three that were previously established by the GOST. Fint's attempt, having spent some of his money, to have a new price set for the MRU-2, one that was twice as high, explaining this by weather conditions, interruptions in supply and making Derobde promise to produce improved finishing of the axe handles with artistic carving in the wood, did not end in success. The director of Derobde, Nepovorotov, only mumbled in response. The price was cautiously raised from 15 rubles to 17.30 rubles, which only with difficulty compensated for the reduction of the output of MRU-2's in physical terms. The overall production volume amounted to 13,840 rubles. (The growth rates were only 101.4 percent.) Since during that time Fint had constructed a steam shop which looked surprisingly like a sauna with all of the fittings for 9,000 rubles and 10 female attendants, labor productivity dropped by almost half, and the output-capital ratio—by a factor of 10. Radical measures were needed. And they came along with scientific and technical progress....

Part Four

Fint was fired and, they say, arrested. The director of Derobde, Nepovorotov, was also discharged and penalized, having been replaced by the generally sober chief of the VOKhR, Kosykh. The young engineer Pavel Lavrovich Zakidayev came to Toporishchino to take over the post of director of Mekhobr. He proved that the MRU-2 is essentially only an axe and suggested producing a fundamentally new product—the "optico-mechanical quality cutting set" (OMRAK). The optical device provided the operator of the OMRAK with more precise determination of the projectory of movement and point of contact of the cutting component and the object. The improved finishing in the form of the inlay, which had outlived its time, was rejected as old-fashioned excess.

Along with the previous metal batching items at 0.50 rubles apiece, optical viewfinders began to arrive in Toporishchino at 45 rubles per unit. Intake control was organized at Mekhobr. The adjustment and fine tuning of the instruments were done in a special optical adjustment shop.

Derobde lagged behind scientific and technical progress! It delivered its wooden batching items at 0.50 rubles apiece as it did before. The secrets of the bent line had been lost and the axe handle came out straight, but it was adjusted using a plumb line. Incidentally, that was necessary for better orientation of the OMRAK operators along the optical axis.

The local leadership placed all its hopes in Zakidayev. And he did not let them down.... In the engineering facility that had been constructed the specialists were poring over blueprints and in the plant administration they did not raise their heads from the calculations and accounts, only resting from time to time in the preventive medical facility (which had previously been the sauna). After long negotiations the price of the OMRAK was set at 100 rubles. Zakidayev adopted a counterplan for producing 1,000 of these complicated items a year. The annual production volume increased to 100,000 rubles, and the growth rate was the excellent amount of 722 percent. The overall Toporishchino indicator was somewhat ahead of that of Derobde with its volume of 500 rubles. (The rate was roughly 682 percent, but this was also very good.) Since the sauna-preventive medical facility was eliminated from the OPF but equipment was added to the engineering facility, the volume of the OPF amounted to 15,000 rubles, and the output-capital ratio was 6.7, that is, it improved by a factor of almost 5. But....

Part Five

This is still not all. As was envisioned in the design and indicated in the instructions for the OMRAK, the optical devices of the set were to be replaced after "each cycle of work." They actually broke down with each blow of the cutting unit on the object. Attempts on the part of OMRAK operators (former wood cutters) to do without these devices were resolutely halted as a violation of instructions. Their searches for optical devices so that they could replace them themselves ended in failure: all viewfinders were invoiced to Zakidayev since his plant took the products they produced for centralized repair at 50 rubles, and this initiative was hardly approved of.

First a repair plant was constructed in Toporishchino and a railroad branch was extended through the Taiga (about 500 people of the Ministry of Railways were employed at the Toporishchino station). Mekhobr, along with Derobde, was reorganized into a PO with 100 people employed (including workers: eight in the procurement shop—the former Derobde, two—in the assembly, five—in the optical adjustment, and five—in the repair subdivisions). When the railroad could no

longer handle the flow of cargo, not having been able to synchronize its operation with the life cycles of the work of the OMRAK, Zakidayev made a bold decision. The Mekhobr PO developed an entire network of repair enterprises of Mekhobrservis—1,000 enterprises with one worker each to replace optical viewfinders for the OMRAK's, two receiving clerks, a manager, and so forth (a total of 10 x 1,000 enterprises = 10,000 personnel).

And the production volume of the Mekhobr PO, including repair services, amounted to 10.1 million rubles (100,000 rubles of new sets of equipment + 200 cycles—the PO no longer accepted its own products—x 50 rubles x 1,000 sets of equipment = 10 million rubles). The growth rate since the beginning of repair was 101-fold! Labor productivity increased by 49.2 percent. That was the record!

The Sixth and Last Part

"All this is the effect of the acceleration of scientific and technical progress and well-thought-out organization," P. L. Zakidayev told our correspondent. "In Toporishchino, and we intend to change its name to Tempovoy, more changes are about to take place and we are proceeding toward bold solutions."

Pavel Lavrovich sat at a large desk in a spacious office placing his hand on a stack of proposals and well-known documents. His face shone with enthusiasm. "We consulted with the collective," continued Comrade Zakidayev, P. L., "and we decided to ask to transform our Mekhobr PO, retaining its traditional profile, into the NPO Rubka. It will include the NII Rubaniye which we have created and which is headed by the eminent scientist Z. A. Mastodontov and the skeleton crew of scientists we have developed locally from former female attendants at the steam shop who have studied without leave from production. We shall create a powerful design bureau and, finally, a plant for robot-manipulators. Through cooperation we shall obtain all the batching cutting units, our associates have found reserves for economizing on resources, they have made these units weigh half as much and have reduced the release price from 0.50 rubles to 0.45 rubles. Here locally, at the gigantic new plant for solid alloys (Z-TS) we shall smelt special edges for the cutting units, and in the future we shall strengthen them with diamond. The complex of the assembly plant has been completed, and it will undergo complete technical reconstruction.

"But what is our final product? It is a flexible automated cutting machine (GARM). It will have a built-in computer which should also be programmed by a programmer. Therefore in our Rubka NPO we will include a computer plant that is being constructed not far away and a large training combine for retraining operators with a dormitory, training and laboratory facilities, a firing range, and a stadium. All this will form the nucleus of the Tempovoy Industrial Center.

"The cost of the entire GARM will be 50,000 rubles 45 kopecks. When it reaches its planned capacity of 500 machines a year, the production volume will be 25,000,225 rubles.

"And this is still not all. A consumer goods plant is being created: from the wastes of the wood-finishing production we shall produce clothespins with built-in miniature electronic clocks and scales which will automatically notify the clothespin block as soon as the laundry is dry. At the same time a loudspeaker device will be activated and play your favorite melody. Do not write about this yet—this will be a surprise for our women. We think that the output of consumer goods will give us another 2 million rubles' worth of products.

"But the main thing, of course, is not quantity, but qualitative indicators. And in terms of reliability, for the GARM, as I have already said, they have increased by a factor of 10! Not to mention the micron precision of the fall of the cutting unit on the object."

P. L. Zakidayev stood up and walked over to the large window that covered the entire wall, and said thoughtfully: "Come back to see us in about 5-7 years. You will see for yourself how our plans are being realized...."

Instead of an Epilogue

Up to this point in the company stores of the city of Tempovoy there are long waiting lines for ordinary axes....

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