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Soviet Union

Economic Affairs

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'Alternate Scenarios' for Economic Reform Reviewed

18200378 Moscow PRAVITELSTVENNYY VESTNIK in Russian No 10, May 89 p 9

[Comments by S. Shatalin, member of the academy, on five basic models of the radical economic reform in the USSR summarized from several dozen foreign sources: "According to the Model and in Actuality"]

[Text] From the Standpoint of Foreign Specialists

The method of alternative scenarios is widely used in foreign practice to forecast the development of the radical economic reform in the USSR. An analysis of several dozen foreign sources has made it possible to identify five basic models of reforms along with the assessments given them by sovietologists:

Name of the Model of the Economic Reform	Proposed Analog	Basic Characteristics	Forecast Consequences of Application	Estimate of the Likelihood of Application in the USSR
Neo-Stalinist model	Traditional Soviet model	Recentralization of planning and management. Use of methods external to the economy to reinforce work discipline and for redistribution of labor resources among sectors and regions. A policy of autarky in foreign economic relations.	Precludes the transition to economic methods of management. Increased bureaucratization in society. Decline in production and consumption. Deepening crisis in the economy and politics. Could bring a certain improvement in the short run.	Close to zero
Model of conservative modernization	Model similar to that used in the GDR	A certain decentralization of management, still preserving predominantly administrative rather than economic levers. Restructuring of central planning without altering the fundamental bases of the administrative-command system of management. Introduction of narrowly targeted incentives, especially for scientific-technical progress, redistribution of labor resources, and development of contractual relations. Increased use of prices for distribution of scarce consumer goods.	Continuation of predominantly extensive economic development. Possibility of maintaining negligible rates of economic growth for a limited period. A certain rise in labor productivity and improvement in discipline. Continuing divergence of planned and actual investments. Conditions not brought about for radical modernization of the economic mechanism.	It is this type of model that is now mainly being used.

Name of the Model of the Economic Reform	Proposed Analog	Basic Characteristics	Forecast Consequences of Application	Estimate of the Likelihood of Application in the USSR
Model of radical reform oriented toward the market	Similar to models being used in Hungary, China, and Yugoslavia	Elimination of administration by directive, renunciation of the setting of targets for economic entities at the lowest level. Orientation toward profit as the sole indicator of economic efficiency. Partial preservation of centralized management and monitoring in a number of the most important spheres of economy—investments, pricing, and regulation of income. Use of indirect economic regulation. A majority of enterprises continues to be state enterprises, and the cooperative develops. No mechanism for increased competition.	Higher efficiency related to offering real independence to enterprises. The market mechanism goes into operation to bring supply into line with demand. Appreciable acceleration of scientific-technical progress. Saturation of the consumer market and improvement of product quality.	The probability that this type of model will be used in the future is increasing, in the opinion of the experts.
Mixed model type	Models used in Hungary, Yugoslavia, and China	Combination in varying proportions of centralization and decentralization, the plan and the market, and state and private enterprises. In the state sector, which embraces the most important branches, there is centralized planning, pricing, and material and technical supply. In the private sector, the market, supplemented by instruments of tax policy and credit policy, serves as the regulator.	Instability of the economic mechanism because of contradictions between centralization and decentralization and between the plan and the market. Possible deepening of the contradictions that exist and emergence of new problems.	Some possibilities for transition to this type of model persist, although, according to the statement of Western specialists, the combination of centralized planning and a restricted domestic market will fail, as is evident, in their opinion, from the example of Hungary.
Model of transformation of a planned socialist economy into a capitalist market economy	Models used in the capitalist world	Reprivatization of property. Radical decentralization. Free labor market, capital market, and market for machines and equipment.	Opportunities open up for development of production on the basis of the most recent technology.	Practically nil

Commentary of S. Shatalin, Member of the Academy

The first thing that needs to be said immediately is that the use of the method of alternative scenarios of the radical economic reform in the USSR is undoubtedly constructive. My colleagues and I, although in a manifestly formalized version, always resort to it in working on problems of the socioeconomic development of the USSR. To a certain degree the method of alternative scenarios has been used by Soviet economists—practitioners and theoreticians—in preparing the model of the economic mechanism now in effect. Although, to be fair, we need to say that this is clearly not enough. We also need to note that the estimates by sovietologists of the possible models of radical economic reform in the USSR are not tendentious in this case and are undoubtedly scientific. There is no need to look in them for any "anti-Sovietism." We need to use them to our own advantage. After all, this is only a case of everyone believing him a strategist when he watches the battle from the sidelines. According to Goedel's theorem, the principle of external supplementation is necessary for a truly scientific analysis of the functioning of systems.

And now we will comment briefly on the five basic models of the economic reform in the USSR and the estimates given them by the sovietologists.

Neo-Stalinist Model

The authors consider the traditionally Soviet model to be its analog. I fully agree with them. The present state of the Soviet economy, the course toward socialist pluralism, thorough democratization of the political system, and the present public opinion in all strata of society, including the country's political leadership, make the likelihood of applying this model nil. Pessimism and conservatism are always necessary, but I think I will not sin against the truth when I say that Soviet society is not threatened by a plunge into neo-Stalinist economic and political structures.

Model of Conservative Modernization

In the opinion of the sovietologists, this model is being used in the GDR. I suppose I agree with all the characteristics of this model, with the consequences of its application, and with the idea that approximately this type of economic mechanism is actually in effect at the present time in the USSR. But there are no chances at all of its remaining the basic model. To a considerable extent, I have already explained why this is the case. The political leadership of the USSR cannot limit itself to halfway measures. Fundamental steps toward restructuring are being undertaken now in all spheres. It is also important that there is greater political activity of society, which will not allow itself to be deceived once again. It is really difficult to appropriately evaluate this situation from outside, even if you want to be perfectly objective. In addition to scientific knowledge, one needs political, economic, and social intuition. The increasing dynamism of all the processes in the USSR, in my view, make the status quo absolutely unreal. The model of the economic reform being carried out in the country will unquestionably evolve.

Model of a Radical Reform Oriented Toward the Market

The sovietologists include among the characteristics of this model that a majority of enterprises would still be state enterprises and that there is no mechanism to encourage competition. These two prerequisites, it seems to me, cannot be mandatory characteristics of the model of a radical reform oriented toward the market.

The dominance of state ownership is not an inseparable characteristic of the socialist economic model. Incidentally, I would note that in describing the alternative models the sovietologists are essentially ignoring processes taking place in the social sphere. And this is one of the most important conditions for choice of the appropriate model. Especially since, in my opinion, economic efficiency and social justice are not antipodes. On the contrary, they support one another. I agree fully with the sovietologists that the likelihood of this type of model (with possible additions) being used in the future is increasing.

Model of the Mixed Type

It seems to me rather idle to examine this extremely special and manifestly eclectic model, which divides the economy into enclaves difficult to identify. I am convinced that for the USSR this type of an extremely vague and internally contradictory model is absolutely unsuitable. It could be a "stopgap," but never a basic model.

Model of Transformation of the Planned Socialist Economy Into a Capitalist Market Economy

This model is the fruit of speculative ideologization and the description of its characteristics and consequences is extremely superficial and a priori, framed in the terms of free competition, and it is by no means a universal description of the models used in the capitalist world. Neither Japan nor Sweden, for example, fit it.

Life is considerably more complicated. In a real economy, regulating procedures and instruments seeming to be the most incompatible are frequently closely intertwined, contradictory processes develop alongside one another, and sometimes economic instruments and incentives of utterly different character operate together. There is, of course, no question whatsoever of any transformation from socialism to capitalism in our country. But the conclusion about the practically zero likelihood of application of elements of this model in the USSR is also offered without evidence and is extremely lightweight. To be specific, we have already been moving step by step toward a mechanism in economic organization that is oriented toward major changes in the technological base of production.

In conclusion, I would like to emphasize the manifest advisability of continuing research in the field of alternative economic models of optimum economic activity. In that effort, it would be important to strengthen the study of social, political, moral and ethical, and cultural aspects inherent in the different versions of the economic reform.

Insurance Coverage of State Production Property Explained

18200319 Riga SOVETSKAYA LATVIYA in Russian 1 Apr 89 p 3

[Report by the chief administration of state insurance in Latvian SSR: "Insurance Coverage of the Property of State Enterprises"]

[Text] Beginning April 1, 1989, voluntary property insurance is being introduced for government enterprises (corporations) which have made the transition to full non-financing by the state. Property insurance for state enterprises (corporations) will be implemented under the terms of the laws ratified by the Ministry of Finance of the USSR on February 2, 1989.

According to the basic agreement, all property owned by an enterprise can be insured. That includes buildings, structures, transmission devices, power and work machinery, equipment, means of transport, vessels for fishing and other uses, fishing equipment, sites of incomplete production and capital construction, inventory, finished production, goods, raw materials and other property, with the exception of livestock, perennial plantings, and harvests of agricultural crops.

A supplemental agreement provides that all property is insurable which an enterprise has received through a property rental agreement, provided the property has not already been insured by the lessor. Also insurable are property received from other organizations and the personnel needed for its processing, repairs and transportation, or for commission, storage, etc.

An agreement may be made with an enterprise to insure a part of its property (for example, means of transport, an individual site, a machine or building, equipment) at full cost. This is the selective insurance option.

Voluntary insurance does not cover documents, cash, valuable papers, business-owned timber or firewood when it is in woodcutting areas or being floated.

With the exception of fishing vessels and gear as well as other kinds of vessels in operation, property will be considered insured against any of the following causes of destruction or damage: floods, storms, hurricanes, heavy downpours, hail, snow-fall, frost, avalanches, landslides, effects from subterranean waters, mountain torrents, lightning, earthquakes, tidal waves, sinking soil, fires, explosions, flooding, gas emissions, or suspended output of electrical energy as a result of fires, accidents, or natural disasters, and accidents (including those involving means of transportation, heating systems, water and sewage lines).

Fishing vessels and gear as well as other kinds of vessels in operation will be considered insured in the event of their destruction or damage due to the following: storms, hurricanes, gales, tidal waves, fog, floods, fires, lightning, explosions, shipwrecks, accidents, damage due to ice and other objects. The insurance also covers the loss of vessels which are missing or have run aground.

No compensation will be given for additional damage incurred as a result of interruptions in production or changes in navigational and other conditions arising as a result of events which are covered by insurance.

The insurant's written statement allows him to insure additional property at a special rate against burglary or theft of transport equipment.

Rates for insurance payments as provided by the basic and supplementary agreements of property insurance are estalished according to the following percentages of total cost.

The gas and oil industries, mining industries, oil and gas refineries, petrochemical, chemical, ore-dressing, as well as metallurgic, woodworking, pulp and paper, transport, trade, and energy industries, including atomic energy plants, will all be charged a rate of 0.15 per cent. Additional coverage in case of burglary (or theft) will be provided at the rate of 0.3 per cent.

Machine-building, construction and other industries will be insured at 0.1%—0.2% for coverage of loss through burglary or theft.

Transport industries: 1.0%; 2.0% for coverage against theft.

Fishing equipment is insured at 3.0%—4.0% for coverage against theft.

For partial property insurance, or selective insurance, rates of payment rise accordingly.

Enterprises' insurance payments are taken from the profits (or income) that remain at their disposal.

The yearly rate decreases (by five, 10, or 15%) for those insurants who have fully insured their property for an uninterrupted period of three, four, or five or more years without receiving any compensation.

Enterprises whose buildings and equipment meet the fire safety requirements, which are explained in standard and standard- technical documents (in accordance with the resolution of the organs of the State Fire Inspectors, MVD [Ministry of Internal Affairs] of the USSR, or the

organs of fire protection under the corresponding ministries and departments) are entitled to a discount of 5% of the total estimated payments.

Voluntary enterprise (corporate) property insurance agreements are concluded by the organs of state insurance.

PLANNING, PLAN IMPLEMENTATION

Two-Phase Plan Period Debated

18200385 Moscow PRAVITELSTVENNYY VESTNIK in Russian No 11, May 89 pp 4-5

[Article by Yu. Rytov, economic commentator: "What Kind of a Five-Year Plan Should We Have?"]

[Text] As is known, we embarked upon the present five-year plan with a plan which had been worked out in accordance with all the canons of former times. And it it was natural that the economic reform, begun at the fundamental level—associations and enterprises—immediately encountered innumerable difficulties. Despite the new logic of economic management, the economic norms had to be set up, to a significant extent, arbitrarily: they were calculated "in reverse"—depending upon those funds which had already been vested in the plan. During the first phase of the reform the state order adopted the traditional form of shaping the collectives' production program "from above." The centralized distribution of material and technical resources virtually deprived the enterprises of the opportunities of setting up mutually profitable ties horizontally.

In essence, the Law on Enterprises (Associations) during the initial period was blocked by the continuing rigid functioning of the administrative levers, as well as by the already developed structure of the sectorial administration. And it took a great deal of effort to just partially fill it with genuine contents....

And, even so, we have not yet completely solved this problem to this very day. Usually cited as being among the principal causes of this are the non-comprehensive, non-integrated nature of the reform, its lagging in the following very important units—wholesale trade and price formation. That is all true. But, in the opinion of many economists, there is yet another substantial reason why the new Law is spinning its wheels: the obsolete nature of centralized planning. Hanging over each sector like the Sword of Damocles are the volume indicators specified for it by the state plan. The leading officials of the sectors bear full responsibility for them. However, the ministries and departments themselves do not turn out products—the latter are produced by enterprises. It would seem that we need to achieve a situation whereby, just as was the case previously, each of us keeps in step with the plan, fulfilling it at any price, thus providing favorable indicators for the sector as a whole.

Nor, of course, can we fail to see that in many sectors mutual relations with enterprises are now constructed on a fundamentally different, partner-type foundation. But it is impossible to close one's eyes to the fact that arbitrary pressure is occurring just as before, that the administrative levers function implacably, and the call "Give! Give!" often obscures any real opportunity for the collective to impart any real substance to matters. Just sit for a while in the office of any general director, and you will become convinced of what an enormous quantity of directives "from above"—both in writing and orally—which pour into an enterprise every day....

Production people are hoping that the 13th Five-Year Plan will be marked by a new qualitative turn in the economic reform. That, in particular, the new five-year plan will be fundamentally different—in form as well as in content.

Ways to radically restructure centralized planning were formulated precisely in the decisions of the June (1987) Plenum of the CPSU Central Committee. This was talked about here in the following manner: "Transform USSR Gosplan into the country's genuine scientific and economic staff headquarters, freed from current economic problems. It must concentrate its efforts on the strategic directions of the planned leadership of economic and social development, shape the most important national-economic proportions, implement the main scientific and technical achievements, improve the structural and investment policy, and ensure a balanced quality in the national economy."

It is obvious that all these mainline directions, which determine the new quality of the economy's growth, should also comprise the foundation of the five-year plan. But just how should such ideas be implemented?

On this matter, animated discussions have been taking place for more than a month now in the press. And how are the problems of formulating the new five-year plan being solved on the governmental level? The answer to this question (albeit not the final one) has been given by one of the May sessions of the Presidium of the USSR Council of Ministers.

L.B. Vid, deputy chairman of USSR Gosplan, reported to those persons assembled here on the proposals regarding the procedure for further plan work. He emphasized that it now requires new approaches and non-traditional solutions. In particular, we must embark upon the 13th Five-Year Plan with the economic mechanism and outfitted with the following new units: an expanded wholesale trade, a system of taxation, and an improved credit system. As practical experience has already shown, all these units must be very carefully checked up on and worked out. Furthermore, additional time will be needed to solve a series of problems for which the remaining year and a half is not sufficient: we need to stabilize the consumer market and normalize the monetary circulation. Therefore, the speaker proposed that the 13th

Five-Year Plan be broken down into the following two phases: a two-year phase and a three-year phase. In additional to everything else, the two-year phase would allow us, in his opinion, to complete the preparation of the price-formation reform and to embark upon the subsequent phase with a new price structure....

Yu.D. Maslyukov, chairman of USSR Gosplan, likwise drew the attention of those present to the fact that the very approach to formulating the plan as such is now changing. Its foundation is now constituted by the overall economic indicators. It is on this foundation that we must work out the economic norms, including the state taxes. We are carefully feeling our way, the speaker continued, through the entire complexity of the present period, when we have grappled with the shortcomings of the old system and the difficulties of introducing the new system of economic management. But we must not hurl ourselves into extremes, dashing aside from the plan into free enterprise. This country has 43 million persons who are poorly provided for, and the state must protect their interests.

And there is yet another important circumstance which we must not allow to slip out of our field of vision. Under the existing system of price formation, to what extent are we capable of adjust the operation of the economy so that it will work correctly? Only a new system of price formation will supply our national economy with a new set of clothes from head to toe....

The discussion continued, and the participants in this session expressed far from an unambiguous attitude toward the contents of the socioeconomic tasks embodied in the 13th Five-Year Plan, or to the methods for carrying them out.

Yu.P. Batalin, the chairman of USSR Gosstroy, decisively supported the proposal for two phases in planning the 13th Five-Year Plan: prior to introducing the new wholesale prices and after introducing them.

However, V.S.Pavlov, the chairman of USSR Goskomtsen [State Committee on Prices], expressed himself with equal decisiveness against delaying the reform of price formation. If we retain the old prices, he said, that would mean retaining the individual norms as well. If we retain the individual norms, they must stem from the assignments approved from above. But just what are the new approaches to planning here?

L.A. Voronin, chairman of USSR Gossnab, in his speech also touched upon the problem of forming norms. The fundamental elements of our plan, he declared, do not include control figures, limits, nor state orders—these are essentially elements of the old national-economic program—but rather stable economic norms. They specifically aim enterprises and labor collectives at tight plans and at fulfilling them. But if we make them non-normative and non-stable, then we lose all, we lose the levers which have been placed in the new economic mechanism. The speaker also noted that in the future five-year plan we must also provide for a sharp change in the structure of public production. Is it really a good procedure when we produce five times as many tractors as the United States does, but we make them without mounted equipment, without hitching units, and we continue to pour resources into this without providing society with the anticipated benefit?

N.I. Maslennikov, chairman of the RSFSR Gosplan, noted in his speech that nowadays the situation in preparing the plan is utterly different from what it was five years ago. Whereas formerly the regions and enterprises patiently waited for solutions and instructions from above, now plan work is going on everywhere. And their biases and distortions too; in certain regions local interests gain the upper hand over those of the All-Union level. But one cannot help but take this process into account and make allowances for it.

In summing up the results of the discussion, N.I. Ryzhkov, chairman of the USSR Council of Ministers, said that we can hardly adopt a final decision on this very complicated question at the present time. Because the formulation of the new plan must proceed on a foundation which is completely different than was previously the case. Specifically, it must proceed as follows: closely interconnected with the economic-management reform, with the development of self-government in the localities, with the rights which have been granted by the state enterprises. And, although we have accumulated a certain amount of experience in working with the enterprises, and we have a normative base, in regional cost accounting we have not even taken the first few steps.

It is obvious that an enormous amount of unusual work lies ahead of us. And no matter how we are overwhelmed with current concerns, these problems must be constrantly kept within our field of vision.

But just how should we correctly formulate the five-year plan? Planning in the old way, whereby everything was calculated and scheduled down to every last ton, is no longer possible. If we hurl ourselves to the other extreme, to which many persons are urging us, saying let's have a free market, then a situation could arise whose consequences are difficult to predict.

Due to various circumstances, I meet with some foreign ministers. Like a red thread, one topic runs through our conversations. They say the following: our market must be geared, to a considerable extent, to your Gosplan, whereas your system of economic management needs to pay a significant amount of attention to our market. We must seek such a solution—that would be a genuine economic model.

When foreign specialists read our publications wherein the following statement is made: "We need a market and nothing more," they ask in amazement: "What is this, do

you want to return to the 19th century?" In any developed country the market is regulated by the state, and a multiplicity of various levers and diverse programs are in operation. We have set ourselves important social goals, and we must achieve their implementation both via the plan and via an integrated system of economic regulators.

The chairman of the USSR Council of Ministers expressed his own cautious attitude toward the proposal for dividing the upcoming five-year plan into two periods. Despite all the shortcomings which have been manifested in carrying out the economic reform, there is one undoubted achievement—a system of stable, long-term economic norms. People, since they believe in stability, have begun to work more confidently. And we cannot retreat by changing the norms during the course of the five-year plan. We can single out of it the first two years as a phase for restoring economic health, but the norms can remain stable.

It was further emphasized that, among the pressing problems, the reform of price formation is causing the most concern. The documents presented here boil it down to a one-time, ad hoc revision of prices, and we can scarcely agree with this.

It was decided at this session to conduct several additional discussions of the problems connected with shaping the 13th Five-Year Plan, and, above all, the proposals on reforming price formation. It was also decided to involve scientists and production people in such discussions.

And so, the formulation of the new five-year plan is still far from finished. But how strikingly different this very process is from that office-bound, "paper-type" creativity, concealed from outside eyes, which used to be practiced formerly! The goals and prospects of our work are being discussed democratically, openly, and publicly at all levels of administration—from the enterprise to the Presidium of the USSR Council of Ministers.

The very careful registering of public opinion, along with the proposals made by scientists, specialists, and production people, allow us to establish feedback with the various social groups of our society, and to take their inquiries and interests into account in formulating the plan.

And, finally, of particular importance with regard to this work is the fact that the last word here will now belong to the USSR people's deputies, who are not just pro forma but de facto responsible to the people who elected them and to those who express their desires in this matter.

And so somehow the various tons and percentages involved here have been shunted aside, and advancing to the center stage are the social criteria, expressing people's standard of living, their aspirations and hopes. The social goals and the optimum ways of attaining them: the creation of an effective, self-regulating economic mechanism.

INVESTMENT, PRICES, BUDGET, FINANCE

Rumors of Currency Reform Denied

18200394 Moscow SOVETSKAYA ROSSIYA in Russian 18 Jun 89 Second Edition p 6

[V. Solovov, deputy chairman of the board of the USSR Workers' Savings and Credit Bank, answers readers' letters under the rubric: "Once Again About Money"]

[Text] Is it true that the country will soon carry out a currency reform, and people who deposited all their financial savings in the savings bank will benefit by it?—N. Kuzima, Saratov.

How do you explain the high level of the population's deposits in savings accounts?—V. Drunin, Norilsk.

V. Solovov, deputy chairman of the board of the USSR State Workers' Savings and Credit bank, replies to readers' questions:

It has already been pointed out in the press that there is no foundation to these rumors. No currency reform in the country is intended. The amount of cash in circulation and the total size of the population's savings on deposit and in the form of state savings bonds is not so high that it is necessary to talk about the need for currency reform. Their combined total, as the press reported earlier, is slightly greater than 400 billion rubles.

It's true that in the last year alone the amount of the population's deposits increased by 30.7 billion rubles, or 11.6 percent of the total amount of all deposits. How to explain this?

The lack of a proper balance between the amount of the population's monetary income and the availability of goods and paid services for the realization of this income implies the presence of available funds in the hands of the population.

In the interests of reducing the cost of additional printing of bank notes, the state tries to attract these funds into savings deposits, state savings bonds and other forms of state savings. As a reminder, income on these savings is paid out in the form of interest. For 1988 the amount of interest totalled 6.6 billion rubles. Unfortunately, for the time being, this interest compensates for a certain reduction in the ruble's purchasing power.

Finally, the fact that savings institutions guarantee the safe keeping of your money plays an important role in the increase of the population's deposits.

Determining Prices for Manganese Raw Material

81440775 Moscow GORNYY ZHURNAL in Russian
No 4, 1989 pp 16-18

[Article by A.V. Gerasimov, V.A. Velichko and A.V. Okunkov, mining engineer-economists at the Central Scientific Research Institute of Ferrous Metallurgy imeni I.R. Bardin: "On the Prices for Manganese Raw Material"]

[Text] Improving price formation for mineral raw materials, particularly for the ores of ferrous metals is a very important task at the present time. In the current price list for manganese products, its use value is not being taken fully into account. The term use value is understood to mean the degree to which the same requirements for final manganese products are met. The development of a wholesale price list based upon average rayon expenses led to a distortion in the monetary evaluation for the manganese raw materials of various deposits. In addition, the current price list does not provide a correct evaluation of the cost of 1 ton of manganese in the raw material of different quality from the same deposit.[1] For example, oxide concentrate of the 1st grade from the Nikopol Basin has a value of 113.44 rubles per ton of manganese and carbonate concentrate of flotation enrichment from this same deposit—48.03 rubles, that is, less by a factor of two. However, assuming the same amount of manganese in steel, 1 ton of manganese in oxide concentrate of the 1st grade is equivalent to 3 tons of manganese in carbonate flotation concentrate. Such a situation derives from the fact that for the production of ferrous alloys on the one hand it is impossible to use low quality raw materials and, on the other, the continuous extraction of manganese in steel in accordance with the "blast furnace - converter" chain is three times lower than through ferroalloys.

When developing the existing wholesale price list for manganese products and for the purpose of computing its consumer properties, use was made of the principle of determining the metallurgical value. In the opinion of the authors, one indicator is not enough for determining the use value of manganese ore products, since the metallurgical value defines how profitable the use of raw material with a certain quality will be in a particular metallurgical process (blast or electric furnace) and it does not describe the degree of satisfaction of the national economic requirement for manganese. In addition, the amount of metallurgical value depends substantially upon the ratio of the items of expenditure to the production costs for the various metallurgical products. As a result, raw materials of the same quality but used in different technological processes have a different metallurgical value (for example, in the production of blast and electric furnace ferro-manganese).

In order for the wholesale prices for manganese raw material to reflect more fully the national economic value, the price level for 1 ton of manganese in a concentrate of a particular quality must be established taking into account the equivalence of a given ton of manganese. In order to determine the national economic value of the raw material, use can be made of an indicator for planning and taking into account the production volumes for the manganese ore products.[2]

In view of the fact that the two principal types of manganese raw material (oxide and carbonate) are used for the production of three alloys—ferro-manganese, manganese-silicon and cast iron for steel manufacture (use is made of grades I, II and lower respectively—the proposal was made to establish 5 wholesale price levels for 1 ton of metal. Oxide and carbonate raw material used for the production of cast iron for steel manufacture must be evaluated according to the same wholesale price level for 1 ton of metal, since these types of manganese raw materials have the same equivalence when used in a given processing stage. In the opinion of the authors, the price level for 1 ton of manganese must be established for manganese raw material with maximum low quality indicators for each of the mentioned processing stages.

In order to determine the price level for 1 ton of metal for various types of products, the coefficients of equivalence are computed by comparing the continuous extraction of manganese for steel from the various grades of concentrate, with an indicator for the continuous extraction of manganese for steel from the basic concentrate. Subsequently the price level for 1 ton of manganese in various grades of concentrate is found by multiplying the equivalence coefficients appropriate for each grade by the wholesale price for 1 ton of manganese in the basic concentrate. The authors of the article propose the establishment of a price based not upon the closing expenditures of a deposit, but rather upon the expenditures of existing production, since the price is a monetary name for the labor materialized in the goods [3].

Those who advocate the establishment of prices for natural raw materials based upon average expenditures refer to the fact that the social value of a product reflects the ONZT [obshchestvenno neobkhodimyye zatraty truda; socially needed labor expenditures] for its production and sale. Moreover, it is maintained that the ONZT are determined based upon average social conditions and average social intensity and skill. However, K. Marx wrote that socially needed working time is that working time that is needed for producing a certain use value under existing socially normal production conditions and for a level of skill and labor intensity considered to be average in a given society.[3]

The principle of closing expenditures does not call for an orientation towards mining enterprises which are backward from a technical and organizational standpoint. The question arises as to what can be considered as socially normal production conditions—average or worse conditions for exploiting the sources of natural raw materials. Those who advocate closing expenses base their position upon the fact that if society is unable to proceed in the absence of products produced under

the worst natural conditions, then these conditions are recognized as being normal and necessary. In many instances, those who favor average expenses recognize these operating conditions only as socially permissible, which from the standpoint of the authors does not change the essence of the problem. If under these conditions the expenses were to exceed the ONZT, then they must not be recognized by society as permissible. The social requirement determines the proportion of the overall amount of social working time required in the various special spheres of production.[4] This is precisely why those who favor closing expenses maintain that socially needed expenses in the mining branches are those labor expenses incurred for an average level of worker intensity and skill realized under the worst of natural conditions. These are the expenses which determine the value of the natural raw materials. The mentioned condition cannot negate the position taken by some advocates of average expenses. For example, Yu.V. Yakovets[5] believes that the social requirement for a product and its quality are taken into account when forming its social value. If the social requirement exceeds the mass of goods produced, then it is given a raised social value. The expenses of enterprises which operate under conditions which are worse than average are receiving recognition and this is creating the prerequisites for expanding production and for satisfying more completely the requirements for raw materials.

A change in the concept of price formation will make it possible to bring the price level for natural raw materials closer to the socially needed expenses and it will provide an opportunity to orient, from an economic standpoint, the national economy towards resource conservation. In addition, the newly enacted USSR Law Governing a State Enterprise (Association) has expanded the cost accounting independence of cost accounting enterprises. Since the output of naturally worse deposits is socially necessary, its production must be profitable to a cost accounting enterprise, that is, an average technical level for production and average labor organization must produce an average cost accounting profit. Hence the prices for the products of the mining branches, including the manganese industry, must be established based upon expenses incurred at objectively worse deposits. Moreover, in order to ensure stable opportunities for all normally operating mining enterprises for carrying out all of the overall budgetary payments and the formation of their own funds throughout the entire period in which the newly introduced prices are effective, it will be necessary, in the opinion of the authors, to take into account during price formation not simply the closing expenses for a particular year of the planned period but also their average weighted amount.

Thus, in accordance with the ranking of manganese enterprises in accordance with the indicators for the mentioned expenses and the normative production profitability for marketable output, when establishing the prices for the 1990-1995 period, the non-graded (gross) concentrate of the "Chiaturmarganets" PO [production association] should be accepted as a concentrate with the basic chemical structure. The acceptance of this raw material as the basic one is also predicated upon the fact that the "Chiaturmarganets" is the third enterprise in terms of capability engaged in the production of manganese raw material. It should also be borne in mind that the production of marketable output will be carried out under conditions involving growth in the volume of ore extracted using the underground method. As a result, by 1995 the production expenses for 1 ton of manganese in concentrate at the mentioned enterprise will exceed the average branch expenses by a factor of 1.25. Thus, when developing unified prices for manganese products based upon average branch expenses, 20 percent of the all-union production of this type of raw material will be of low profitability (particularly at the "Chiaturmarganets" PO) and approximately 5 percent—unprofitable (Dzhezdy RU).

Price formation for products of the manganese industry, based upon closing expenses, will lead to the appearance of differential rent at the Ordzhonikidze and Marganets GOK's [mining and concentration combines]. In order to create equal managerial conditions for those manganese enterprises which exploit different quality mineral resources, the additional income obtained from the use of a natural source of raised natural productivity must be withdrawn for all-state needs in the form of payments for natural resources and only partly redistributed within the sub-branch for the purpose of compensating for losses and creating definite financial funds for ensuring the normal operation of the Dzhezdy RU. In the event the prices are developed based upon the level of average branch expenses, the payments for the use of natural resources, established in accordance with the principle of polarity, will appear only as a mechanism for redistributing the profit within the branch. S.M. Ulanov recognizes this fact in his work.[6] However, this gives rise to the question as to how can a system of payments for the use of natural resources, under this concept, be in harmony with the national interests. In the given situation, as is well known, it should be recognized that the social interests are not always identical to the departmental interests and, moreover, the natural resources are a part of the national property and by no means branch property. Hence, the branch on the whole must make payment to society for the mineral resources placed at its disposal.

Rental payments for the use of different quality natural resources must be differentiated, in the opinion of the authors, for each enterprise based upon a consideration of the rent-forming factors. Moreover, the differentiated payments must be stable for the entire period that a price is effective. The mentioned differentiated norms should be determined using the residual method: by deducting from the overall amount of profit of each enterprise the average-weighted profit for the entire period that the newly introduced prices were in effect and all other payments and withholdings.

If, from the standpoint of S.M. Ulanov,[6] the rates for a unit of liquidated reserves appear to be stable in terms of time and unified for all mining enterprises of each branch, then such an interpretation presents it as nothing more than absolute rent. In the opinion of the authors of the article, such rental payments are also legal and must be withdrawn by the owner of the mineral resources—society as a whole. However, while in agreement with such a definition for payments, S.M. Ulanov advocates the use of closing expenses in price formation, although he himself does not wish to do so.

After establishing a price level for 1 ton of manganese in concentrates, with a maximum low quality for each grade, the amount of allowances and supplementary payments for a deviation in the chemical structure of the raw material evaluated from the accepted figure must be determined.

Allowances and supplementary payments for adding on to the wholesale price for the basic types of concentrate are being considered at the present time only for the manganese and moisture content and this is completely inadequate for evaluating their quality. The quality of manganese raw material affects not only the degree of satisfaction of the national economic requirement, but also the technical-economic indicators for the production of manganese alloys. The effectiveness of metallurgical smelting, in addition to the manganese and moisture content, is affected to a substantial degree by the presence of such chemical structure components as phosphorus, the principal and acid oxides and by losses during calcination. The effect of the mentioned components can be evaluated using the indicator for metallurgical value.

The metallurgical value of manganese raw material should be determined in conformity with the smelting of the more massive types of alloys from ore of the Bolwhe-Tokmak, Nikopol and Chiatura basins and the low phosphorus ores of central Kazakhstan. Correlative analysis can be employed for determining the relationship between the indicators for metallurgical value and the content of the mentioned chemical structure components for each grade of manganese raw material. The amount of allowances and supplementary payments is determined based upon the results obtained. Since the proposed approach calls for the price level for 1 ton of manganese of various grades, used for the production of the same corresponding type of alloy, to be established for raw material with maximum low quality indicators for each grade, then only the supplementary payments must be determined for the indicators for manganese content and the ratio of phosphorus to manganese (P/Mn). In the event of a deviation in the manganese and phosphorus content from the assigned technological limit for quality in a given grade of manganese raw material, it must be evaluated according to the price level, allowances and supplementary payments for that grade the indicators of which it conforms to.

If the manganese content in the concentrate evaluated is lower than that needed for the production of ferromanganese (with a permissible phosphorus content), then the wholesale price for 1 ton of manganese is determined by summarizing the price for 1 ton of manganese in raw material, intended for the production of manganese-silicon, the supplementary payments for exceeding the manganese content (higher than 33 percent) and the appropriate scale for allowances-supplementary payments for the content of other components. For exceeding the permissible phosphorus content, the raw material must also be evaluated according to the price level for 1 ton of manganese in the raw material intended for the production of manganese-silicon and in accordance with the appropriate allowances and supplementary payments.

This method of evaluation, according to the authors, will make it possible to interest the manganese ore enterprises in producing high grade raw materials, especially low phosphorus types.

The prices for manganese raw materials must exert a regulating effect with regard to achieving a balance in supply and demand. As is known, the price for a particular product can be higher or lower than its cost and only by way of an exception will it coincide with its cost if the demand and supply are mutually equal.[4] In actual practice, those metallurgical enterprises which consume manganese ore raw materials encounter just such a situation when, in the face of an excess of low grades deemed unsuitable for the production of ferroalloys, a critical shortage is experienced in high quality and especially low-phosphorus raw material. Hence the conclusion is drawn concerning the need for deviations in the price levels for manganese concentrates of lower and higher grades from their costs. For the lower grades of concentrates, the mentioned deviation must be directed towards reducing the price level and for the higher grades—towards increasing them. Since the cost of a product is determined by the proportion of social working time required for its production, which in turn is determined by the social requirement for the particular product, the price for low grade manganese raw material must be lowered to that point where its supply volume equals the amount of demand. In other words, if the branch can satisfy the requirement of blast furnace sinter production for raw material without the use of the Chiatura agglomerate ore, or by means of other enterprises, then the price level for raw materials of a given quality must be determined in accordance with the closing expenses of these enterprises. In another instance, the achieving of balance in supply and demand must also become a limit for deviations in the wholesale price for high quality low-phosphorus raw material. At the present time, not enough high grade raw material is being imported. Thus, from the standpoint of the authors, our domestic raw material that is similar in quality to that being imported must be evaluated according to the international market prices. Such an approach in the development of prices will stimulate the mining

enterprises into augmenting the shortage in raw materials by means of their own resources. The metallurgical enterprises will be interested in lowering the specific expenditure of manganese per ton of steel. However, a question arises as to how to determine the moment when balance is achieved in supply and demand and the moment when the prices must change in the opposite direction. In the opinion of the authors, this will be determined by the consumers and producers themselves.

The role played by the price forming organs includes determining the price level, the upper limit for a deviation in the price from the cost of the raw material, controlling observation of it and also defining the mechanism for allowances and supplementary payments.

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INDUSTRIAL DEVELOPMENT, PERFORMANCE

Fate of Unprofitable Enterprises Reviewed

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[Article by Natalya Petrovna Figurnova, candidate of economic sciences; associate professor, Political Economy Department of Economics Faculties, Moscow National Economic Institute: "On the Fate of Economically Insolvent Enterprises"]

[Text] For decades, socialist production in our country expanded its field of activity while simultaneously raising its technical level as a result of new construction. Modernization of existing enterprises, however, was on a small scale. Such an orientation was to a considerable degree forced upon us because we had to create new branches from the ground up and to form production complexes in new regions. Because the process was protracted, deep disproportions began to be detected in technical development between old and new enterprises. Notwithstanding the annual increase in the activation of industrial production capital, which was about 7 percent in the last 2 decades[1], the share of machine tools and equipment in service more than 29 years has increased: from 1973 to 1985 from 8 to 14 percent. The retirement of capital during that time declined from 1.7 to 1.4 percent a year while the capital-output ratio in industrial production rose 1.2-fold.[2] The average service life of productive fixed capital increased by 2 years and by 1985 was 26 years—4 years higher than the normative level.[3]

An increase in the service life of productive fixed capital attests to the consolidation of the positions of technically backward and obsolete production. And unfortunately, this trend is not slackening. Despite pledges by ministries and departments to retire obsolete equipment at a rate of 8-10 percent a year, in 1987 this indicator was lowered by 1-2 percent.[4] Hence also the economic insolvency of a considerable number of enterprises.[5]

In what way are losses from the perpetuation of technically backward and obsolete production primarily expressed? First of all, in the following way: the aging of equipment necessitates the investment of resources in its capital repair in order to keep it in working condition. The sad paradox of the existing situation, where the "dead grips the living," lies particularly in the fact that production that is supposed to leave the stage doe not permit the use of new technology. New equipment is frequently not included in the technical system of obsolete production. The concentration of such equipment at new enterprises and in new shops is frequently ineffective because it is not utilized completely either due to a shortage of workers or their deficient skill level. Losses of the national economy due to the underutilization of new, more productive equipment is over seven percent of the annual overall volume of production of goods and services.[6]

Technically backward, obsolete, and moreover unprofitable production is surrounded by a stagnant zone, the existence of which creates serious obstacles to scientific-technological progress and impedes the positive regrouping of the work force and its adaptation to the higher demands of modern science and technology. The varying degree of effectiveness of enterprises also continually aggravates the problem of standardizing the normative base of planning.

Publications in the sixties have already examined problems pertaining to the normalization of the economic structure, to liberation from technically backward and

therefore unprofitable production. However the proposed avenues of solving these problems were not understood and evaluated because they did not fit the customary framework of the economic mechanism. Thus, A. M. Birman's suggestion back in 1967 that cost-accounting levers be used to close down enterprises consistently operating at a loss was roundly rejected (see: LITERATURNAYA GAZETA, 11 January 1967, 1 February 1967, and 22 March 1967).

The economic reform of 1965 substantially expanded the framework of the independence of enterprises and gave production collectives the possibility of modernizing means of labor at the expense of production development funds formed from profits. However the absence of wholesale trade in means of production and the relatively small size of the funds proper substantially restricted the independence of the enterprise, which suggested the conclusion that the introduction of advances of technological progress was difficult for individual enterprises; it proved to be only within the power of the association. The association will become the cost-accounting unit that introduces technological progress.

We recall that attempts were made in the early sixties to equalize branch structure with the aid of the "patronage" [*shefstvo*] of progressive enterprises. However it proved to be impossible to cope successfully with the basic tasks of introduction of new equipment and technology. The solution to the existing situation was found in incorporating backward enterprises in economic associations.

The experience of the work of associations in turn showed that they cannot independently resolve such a complex problem as the reconstruction of existing production. The latter, vis-a-vis them as well, also requires exceptionally large means and entails a certain amount of risk for which enterprises and associations are not prepared. Administrative prohibitions of ministries on shutting down capacities and facilities are an obstacle to the reconstruction of production. The point here is not the quest of gross indicators which enterprises at least try not to lower by any means.

Just how do economically insolvent enterprises stay "afloat?" For many years, one "prescription" has worked without fail here: the transfer of funds when ministries and departments take them from profitable enterprises (associations). This "prescription" is bad because it does not encourage backward enterprises to "get on their feet," because it legalizes and actually encourages dependency. Such a condition cannot be called either socialistic or just.[7]

How can lagging enterprises be made to show a profit? This is not only extremely important, but is also unconditionally timely because existing unprofitable production should be liquidated in the last 2 years of the current five-year plan.[8]

The basic directions of realizing this task were articulated by the July (1988) Plenum of the CPSU Central Committee. The report delivered at the plenum by M. S. Gorbachev discussed the possibility of making widespread use of credit, of the reorganization of enterprises that are presently being "fed" pittances by the ministries, of the liquidation (at the very least) of such enterprises, of the leasing of these enterprises to work collectives.[9] Naturally it is impossible to get rid of unprofitable and especially marginally profitable production once and for all since the development of cost-accounting units presupposes the differentiation of farms, some of which are in the last ranks. What is more, the latest advances of technological progress cannot be simultaneously introduced at all enterprises. The formation of society's economic structure continually encounters the braking tendencies of lagging production. Therefore the elimination of technologically backward and obsolescent production must be part of every reproductive cycle. It is a stable, not an episodic task even though it is manifested in different tangible forms.

A number of economists have correctly noted that the awareness of the possibility of bankruptcy spurs not only lagging but also profitable enterprises onward, compelling them to look continuously for ways of improving their economic activity. The experience of China, Hungary, and Poland shows that bankruptcy and its consequence—the closing down of enterprises—cease to be a hypothesis and become a reality. Laws on sanctions and bankruptcy in these countries are already applied in practice.[10] And even though the experience of using them is brief, it contains much that is instructive.

The bankruptcy of enterprises increases social tensions. It can be assumed that this circumstance impedes the wide diffusion of the law on enterprise bankruptcy. It is evidently for this very reason that in 1987 out of several hundred insolvent enterprises (the majority of which were cooperatives), only a handful were declared bankrupt.[11] The bankruptcy law was not applied to them.[12] However excessive timidity in applying this law promotes the legalization and stabilization of marginal enterprises and creates a kind of alternative to the active search for ways leading to effective production.

In the effort to eliminate lagging production, much hope is placed in the lease contract associated with the contractual form of production organization and material incentives. It should stimulate effectiveness.

Economic reforms in the People's Republic of China demonstrate the experience of introducing the lease contract. Starting in August 1986, the city of Wuhan has held open bidding on contracts to lease unprofitable enterprises. Both collectives and individuals may become contractors. Thus, for example, the Wuhan Auto Engine Plant, which was nearly bankrupt (its debt was 12 million yuan; its property was valued at 15 million yuan) and which had a work force of 1500 persons, was leased by a group consisting of 21 of the plant's workers.

QINGJI JIPAO reports that notwithstanding the short time that has elapsed since the experiment began, 35 previously unprofitable small and medium-size enterprises in Wuhan that were taken over on a lease contract basis have begun showing a profit.[13]

The lease contract is also being introduced in our country—for the most part at public catering and consumer service enterprises. The first positive results were realized at Estonian SSR enterprises and at several Moscow enterprises. At the present time, enterprises in other branches and regions are being converted to a lease contract at the present time. Among them, in particular, the Butovskiy Construction Materials Combine (Moscow Oblast), which has been experimenting with the new forms of management since 1 March 1988. It has adopted a policy of raising the workers' interest in the results of production and of strengthening the proprietary feeling of every member of the collective. The belief at the combine is that the second form of economic accountability corresponds to the objectives to the greatest degree. It is by using this form that the combine hopes to double the profitability of production and to acquire financial stability by 1995.

The solution of the problem of unprofitable production varies for all specific conditions and alternative variants are needed here. It is important to determine the conditions under which positive results can be expected in such cases. The orientation toward the lease contract as a way of increasing the effectiveness of management is justified for labor-intensive production where organizational restructuring and the intensification of the human factor are decisive conditions to the stabilization of the enterprise's financial status. For farms [*khozyaystva*] on which it is unrealistic to eliminate lag without making the transition to a new generation of machines and new technology, such a form of production organization will not produce positive results because radical reconstruction presupposes maneuvering large volume of capital investments and interbranch coordination.[14]

It appears that the radical reconstruction of production or the liquidation of enterprises must become the object of centralized planning. This will make it possible to prepare the economic rear for the "painless" procedure of closing down or temporarily suspending activity at an enterprise: to increase production capacities at leading enterprises, to retrain and find employment for released workers at society's expense and other required measures.

In this connection, we deem it advisable to make provision for the retirement of obsolete production (enterprises) in the long-range plan for the development of the national economy. The question of long-term planning of new construction should be resolved after the number of technologically backward, unpromising enterprises to be closed down in every five-year plan period has been determined and recorded in drafts of planning documents (broken down by branch).

Unprofitable enterprises also include enterprise-monopolists that are irreplaceable producers of certain products. The provision in the USSR Law on the State Enterprise (Association) on the possibility of bankruptcy can hardly be applied to them. In this case, financial normalization should be carried out in conjunction with measures to overcome narrow product specialization.

It is extremely important to increase the interest of ministry and department officials in the financial normalization of unprofitable and marginal enterprises. The incentives here may vary. Such a variant is in particular possible: altering the procedure by which ministries make payments for resources used by unprofitable economic units. At the present time, payments to the centralized fund are restricted to the norm that is established by the ministry itself. The procedure according to which the norm would be determined by USSR Gosplan and the USSR Ministry of Finance would obviously substantially reduce the freedom of the apparatus of the branch ministry and its institutions to make ineffective decisions. Only two possible avenues to the solution of the problem will remain: either to help the collective to get on its feet in a short period of time or to close down the enterprise, selling its productive capital to other, more effective work collectives. In individual cases, budget funds are used to implement measures for the liquidation of unprofitable enterprises, with the condition that the state order for the implementation of the corresponding measures is carried out.

Thus the seizure of technologically backward, obsolescent, i. e., economically insolvent, production facility is the constant impetus to improve the reproductive structure. This problem has also been quite poignantly manifested in socialist society. The paths that have been found today for resolving the contradictions connected with the varying effectiveness of economic links must be depicted not by the seemingly simple means of perpetual campaigns but on a strict scientific basis.

Footnotes

1. See: "Narodnoye khozyaystvo SSSR za 70 let" [70 Years of the USSR National Economy], Moscow, 1987, p 148.

2. See: "Uskoreniye sotsialno-ekonomicheskogo razvitiya i perspektivnoye planirovaniye" [The Acceleration of Socioeconomic Development and Long-Range Planning], Moscow, 1987, p 132.

3. Ibid., p 136.

4. See: PRAVDA, 1 March 1987, p 2.

5. The number of unprofitable enterprises in the national economy in 1988 was nearly 24,000 (see PRAVDA, 28 October 1988, p 5); annual losses from unprofitable operation throughout the national economy as a whole total 10-11 billion rubles (ibid.).

6. See: PRAVDA, 1 March 1988, p 2.

7. See: L. I. Abalkin, "Novyy tip ekonomicheskogo myshleniya" [The New Type of Economic Thinking], Moscow, 1987, p 123.

8. See: PRAVDA, 28 October 1988, p 2.

9. See: "Materialy Plenuma Tsentralnogo Komiteta KPSS 29 iyulya 1988 goda" [Materials of the 29 July 1988 Plenum of the CPSU Central Committee], Moscow, 1988, p 31.

10. It is interesting to note that the problem of unprofitable and marginally profitable enterprises in the indicated countries was exacerbated in connection with the strengthening of the positions of self-financing in the economic mechanism, which reduced the redistribution of profits. The number of unprofitable enterprises increased. This circumstance revealed the need for structural change in the economy and was responsible for the promulgation of special normative acts on sanctions in the event of the bankruptcy of unprofitable and marginally profitable enterprises.

11. In Poland in 1985, 20 percent of the enterprises brought the state 1141 million zlotys in losses (see: TYGODNIK DEMOKRATKYGZNY, 30 May 1986).

12. Since cooperatives can swell the ranks of unprofitable production facilities, the transfer of unprofitable state enterprises to them can only be viewed as a temporary measure suitable for bringing a lagging production facility up to the mark, not a measure that is suitable for all contingencies. Given the relative saturation of the market, cooperatives that do not keep up with modernization and the reconstruction of production will find themselves in the last ranks according to its laws.

13. See: QINGJI JIPAO, 20 November 1986.

14. The possibility of eliminating unprofitable operation depends not only on the size of the enterprises development fund but also on its commodity backing. The performance of associations and enterprises converted to full economic accountability and self-financing shows that only 80 percent of the economic incentive funds were used in 1987. Under these conditions, the use of the population's funds, as was the case in the Butovskiy Combine, will hardly play the role of a sufficiently active means for bringing technologically lagging production facilities up to the mark.

Deputy Chairman on Developing Chemical, Timber Industries

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[Interview with V. K. Gusev, deputy Chairman, USSR Council of Ministers, chairman of Bureau of the Council of Ministers of the Chemical-timber Complex by Ye. Khokhlov: "To Overcome Disproportions"]

[Text] **Deputy chairman of the USSR Council of Ministers, Chairman of the Bureau of the Council of Ministers of the Chemical-timber Complex, V. K. Gusev, answers questions concerning the chemical-timber complex**

Three years of the Five-Year Plan which should introduce a radical turning point in the economy are behind us. Laws concerning the state enterprise and cooperation have been enacted. Enterprises of all sectors of industry are now operating on principles of complete profit and loss accounting. The flow of economic directives is decreasing, giving way to contractual relations, bank crediting and wholesale trade. The economic reform revived the national economy and production rates began to increase. At the same time considerable complications and contradictions appeared not only in development of individual sectors but also of major state complexes. What are the causes of these problems; how can they be solved and how are they assessed at the governmental level? Sovetskaya Rossiya has already published an interview concerning the state of affairs in machine construction ("Priorities and Perspectives", 17 Aug 1988). Today, Vladimir Kuzmich Gusev, deputy Chairman of the USSR Council of Ministers, chairman of the Bureau of the Council of Ministers of the chemical-timber complex answers questions asked by Sovetskaya Rossiya correspondent Ye. Khokhlov.

[Khokhlov] Vladimir Kuzmich, evidently it is best to begin with a summary.

[Gusev] I also believe it is necessary to summarize, since it is impossible to present nothing but facts. Therefore, let us examine how these three years turned out in the chemical and timber industry. Its role in the national economy has grown. Today, industrial production at enterprises of the five ministries included in this complex amounts to more than 100 billion rubles. The complex produces an absolute majority of both traditional and modern materials. There is no place in which they could not be used. Demand for them is increasing.

Basic economic indicators show that the planned tasks for the three years of the Five-Year Plan have been fulfilled. The average annual rate of growth of production was 4.1 percent with the plan rate at 3.9 percent. However, this brings no satisfaction to us, directors of the Bureau, nor in the ministries nor in the goverment nor, even more, to the public. The shortage of very many kinds of chemical and timber production is increasing. In addition to those named above, there is a shortage of

chemical fiber for light industry, plastics, medicines and vitamins. I am not even mentioning paper, cardboard and sawn timber. The volumes of their output satisfy 70-75 percent of the needs of industry and the general market. The situation concerning output of production related to the modern categories is quite unenviable; only 35 percent of the demand is being met.

What is the cause of such a contradiction involving fulfillment of planned task and simultaneous increase of shortages? Comparison of our structure with the structure of the economy of other countries gives a rather clear answer. The share of chemical production in industrial production is: 11 percent in the USA, 13 percent in Western Germany, 14 percent in Eastern Germany, 16 percent in Japan and 6 percent in the USSR. As you see, our material and technical base has half or even one third of the opportunities available to related sectors in the economy of highly developed countries. Moreover, we must emphasize that the demand for chemical and timber materials, especially in recent years, is increasing by 15-20 percent a year and certain forms of new construction plastics and paper are increasing by up to 40 percent a year which indicates the objective needs of society for development of this industry. However, in the 12th Five-Year Plan, it was impossible to have high rates of growth of the chemistry-timber complex.

To the causes stated, we must add that 5-7 percent of the enterprises in the chemical-timber complex operate irregularily and allow stoppage of planned tasks and these faults have become chronic in some of these enterprises, including the Sumgait associations "Sintezkauchuk" and "Orgsintez," the Sayansk association "Khimprom," the Dneprodzerzhinsk association "Azot," the Manturovo biochemical plant and the Bratsk timber complex.

There is definite concern that production of mineral fertilizers, synthetic resins and plastic, paper and pulp cannot be increased up to the set volumes in the remaining 2 years of the Five-Year Plan. We were counting on new shops and enterprises but construction of them is lagging. A total of 4 billion rubles of capital investments are under-assimilated in sectors of the complex. Analysis shows that the basic causes of such a situation are the absence of equipment and non-fulfillment of the plan by construction and installation organizations.

[Khokhlov] Immediately the question arises: where are the forces and funds being directed?

[Gusev] It is common knowledge that the Party gave the main priority of development of the economy in the 12th and 13th Five-Year Plan to the social sphere and, in this period of social reorientation of our plans, we should more precisely determine the goals and the direction of movement and means with which we may achieve these goals. As world experience shows, rapid movement forward is really only possible with the help of scientific and technical progress, which necessarily assumes a high level of use of chemical material. Thus, for example, the planned significant increase of volumes of housing construction is determined, to a large extent, by the ever increasing rate of production of linoleum, plastic pipes, sanitary engineering products, wallpaper, paints, heaters using synthetic fuels and other articles. Overlooking scientific and technical progress would mean disrupting the entire social and economic program. The government understands the seriousness of this situation. However, many problems remain.

As analysis shows, the rapid progress in the chemical and timber industry made by the scientific institutions and planning agencies of our sectors may be ensured only at the expense of radical reconstruction of operating productions. This requires highly-productive and highly-efficient equipment. But such equipment is not available. We are completing installation of imported equipment, purchased by "oil" billions. Very little of our own domestic equipment is being produced, not more than half of the demand. Moreover, its level of sophistication precludes realization of the latest technical ideas.

In spite of the fact that machine construction is now being developed at accelerated rates, its possibilities are limited, as before, and the chemical-timber complex will be held back for some time. This led to an extraordinary situation in the state of the active part of the productive assets of the chemical-timber complex enterprises. They tend to age steadily and now the degree of their wear is the highest in the national economy. The rather obsolescent equipment simply is not suitable for present-day technology.

Everything in the national economy is interconnected. In order to create new generations of machine tools, electrical engineering equipment and electronics equipment, we must also have new construction materials. Where can we get them?

We see a way out in a more intensive creation of our own machine building base, in placement of some orders with machine building plants of socialist countries, in creation of joint enterprises to which the foreign partners will bring their equipment and by acquisition of the newest equipment from abroad at the expense of the enterprises themselves. There is beginning to emerge a "narrow front" in the most progressive directions and such a breakthrough will provide necessary materials and articles for the national economy. Actually, this is what is happening. Production of plastics for producing construction items is increasing most rapidly of all (by 20-50 percent for three years). As envisaged in the plan Conception of Economic and Social Development of the Country, production of modern polymer construction materials will increase by 18 percent a year in the following Five-Year Plan while the average annual increases of production of the chemical-timber complex will increase by 7 percent.

[Khokhlov] What measures of an economic nature are planned for launching in order to expand and renovate production? The reform, as yet, did not solve many problems: the "expenditure" approach still prevails; gross indicators predominate, as always. Take the rates about which you, Vladimir Kuzmich, spoke: the percent of growth is above the planned rate but many tasks are not being fulfilled. Are increases of expenditures, costs and prices involved here?

[Gusev] All enterprises of the chemical-timber industry have, by now, worked for a year on principles of profit and loss accounting according to the first model. Positive economic results were obtained at petroleum processing and petrochemical industry enterprises, where calculations of all resources showed an increase of volumes of net production. Consumption of materials was greatly reduced. Other sectors began to develop this version of profit and loss accounting. Production cost in the chemical industry was reduced by 6 percent (more than was envisaged by control figures) since the beginning of the Five-Year Plan. Output-capital ratio is increasing; that is, the indicators are improving. However, in addition to high efficiency, production is needed. Here is where the problem actually arises. The picture was just about the same at some plants which I visited recently. The profit and loss collective is reducing the number of workers. It turns out that labor productivity is increasing but not 1 ton of additional product is obtained. Using profit and loss accounting independence, they follow the path of elimination of unprofitable productions. However, these may be necessary to the national economy as, say, production of higher alcohols in Dzerzhinsk production association "Sintez." On the other hand, it is not always unprofitable; someone will find methods of obtaining a profit by ensuring the best operation of equipment, improving the technology and increasing output volumes.

The new system of management, stimulating growth of efficiency, still does not have a mechanism which would directly induce an increase of production output. We need a clear-cut regulator. Possibly, we should establish such a procedure: for each percent of increase of production in natural measurements, increase the wage fund. We are thinking this over. Generally, we must say: "perestroyka" opened, in the economy, so many paths of development and also gives such variants of solutions which were unknown even recently. Cooperatives are undertaking waste reprocessing. Some enterprises are preparing for the transition to the lease of enterprises. All of this also expands production possibilities.

A sectorial bank was established in Minneftekhimprom recently. Why was this necessary? The current accounts of enterprises now contains 1.5 billion rubles of unused capital of different funds for a particular purpose. The enterprises cannot spend these funds; there are no available reserves of metal or cement in the country. However, at the same time, others are in extreme need of credit. The bank is "unfreezing" these billions and they are bringing double or triple profit. In the future, the role of the sectorial banks will be expanded and, upon the possibility of free purchase of equipment, they will further accelerate technical re-equipping. This is especially important since the possibility of obtaining state investments now is limited.

[Khokhlov] Vladimir Kuzmich, I want to remind you of our past interview in Sovetskaya Rossiya during which you talked about problems and prospects of export. It was published May 1987 under the promising head-line "Russian Timber Speaks a New Word on the Foreign Market". Has anything changed since then?

[Gusev] Not only timber but also almost all production of the chemical and timber industry is enjoying umlimited demand in the foreign market. However, because of insufficent volumes of its production we can sell no more than 10-12 billion rubles worth a year. At the same time, we must emphasize that importation of chemical and pulp and paper production is 5-5.5 billion rubles. The backward structure of our export restrains trade. Paper, cardboard (but not round timber) and products of deep chemical processing are what make money on the world market! However, after 1.5-2 years no revolutionary transformations have occurred. Deliveries of pulp, cardboard, plywood, slabs and sawn lumber increased slightly. But the structure as a whole remains unchanged.

How do we directors of the Bureau see the program of foreign economic activity in the next few years? There are two basic trends here. The first trend is to expand exportation, mainly by use of finished production which, previously, we exported little or not at all. Take furniture, for example. As you know, the government adopted a decree calling for a 1.8-fold increase of furniture production by 1995. This will make it possible not only to meet the demand within the country but also to supply large quantities of furniture for the world market.

The second trend, the most promising one, is wide-scale cooperation in production and, first of all, creation of joint enterprises with foreign firms both in the USSR and in the partner's country. There are now 28 such enterprises and the work is continuing. Some industrial complexes for production of chemical and petrochemical output are being established in Western Siberia, specifically in Tyumen Oblast, with participation of Italian, French, Japanese and West Germany firms. Production will be carried out on our own equipment in places at which we have sufficiently advanced technology. If the foreign firm has better equipment, its equipment will be used. Some of the contracts have been concluded and others are being prepared. Of course, friction develops in the negotiations; the foreign partners would like to export our raw material, as before, but we must develop on site processing.

Modern systems of control of technological processes are already being released to the market at the Nizhnekamsk Soviet-American enterprise. An agreement was concluded concerning creation of a branch of the Polish

"Polleny", which I think is well known to our buyers for their perfumes. The enterprise "Sovplastital" has been established for production of goods for national consumption. Visitors to the exhibit "Chemistry and Acceleration of Scientific and Technical Progress" may see samples of this production; there are mirrors without glass, mahogany frames without wood, statuettes "under marble", a complete illusion in form, color and weight and elements of decorative trimming for furniture, which elements cannot be distinguished from natural threading.

[Khokhlov] The wonders of modern chemistry are well known but its blessings are costing man and the environment more and more. The chemical and timber industry today is among the sectors which are criticized most. How does the government assess this contradictory situation?

[Gusev] For the last three years alone, USSR Minkhimprom issued more than 100 decisions to suspend shops and sections at 69 enterprises, almost one out of four. Construction of a phosphorite mine in Estonia was stopped and a quarry and enrichment mill for phosphorus raw material in Buryat were shut down. Now local and inspection agencies have prepared proposals to limit output at 77 enterprises of the complex.

The list of bans and limitations is long but involves what was said. The main thing is that the readers are aware of all aspects of the problem. You know it is illogical to insist on the closing of plants which produce synthetic fatty acid and complain, at the same time, because soap and powders are not on sale; to be indignant at faded colors but not to permit development of dye production.

Shortcomings in the matter of environmental protection were awarded and ignored for years. Now all unfavorable information is being widely circulated and is causing sharp reaction by the people. Naturally, it did not circulate without causing high emotions and provoking extreme measures. Emotion and over-reaction, as is well known, make it difficult to arrive at responsible decisions. I, for example, am convinced that calm discussion could achieve the same results in matters of environmental protection with much less loss for the national economy. Stoppage of complex technological process leads to annual loss of production volumes to the amount of 1.5-2 billion rubles. The production lost must be bought, as a rule, via foreign exchange. Making up the shortage of soluble pulp, previously produced by the Priozerskiy plant, costs us 35 million non-currency rubles. This year, we will begin to buy phosphorus ore abroad, for the first time.

The government is now spending large amounts to normalize ecological conditions. Thus, the nature-protection construction program, developed by Minlesprom and Goskomprirod, at a cost of 2.2 billion rubles provides for guaranteeing, by 1995, protection of reservoirs for paper and pulp combines and for fulfilling, in 1995, the tasks of all operating environmental protection resolutions. The complex of measures will make it possible to reduce the specific discharge of unpurified drainage into reservoirs 20-fold and this will not exceed permissible levels.

The problem of complete use of raw material is a major problem. There are many sad examples in which 1 ton of finished chemical output produces 5-10 tons of waste, which form vast dumps, slime deposits and "white sea". We are presenting serious claims to a large collective of scientists who are working too slowly on creation of low-waste and waste free technologies. The many violations of technological regimes and rules found at enterprises are disturbing. Ignorance and lack of elementary discipline of personnel create emergency situations, leading to environmental pollution.

There are many such problems, the solution of which requires not only enormous funds but also a long time. An objective attitude is also essential. Appeals to "stop chemistry" are not realistic. Is it possible to assume, if only in abstract calculations, that the overall volumes of chemical, microbiological and timber production may not increase in the future? There is only one answer; if this occurs our State will face its gravest crisis. In the actual situation, with consideration of the demands of the economy and the people, the government plans a significant increase of rates of development of the chemical industry. The most important tasks for 1989-2000 will be creation of ecologically safe processes and assurance that procedures at each enterprise meet the required safety standards.

[Khokhlov] The development of the Concept of Social and Economic Development of the Country up to 2000 is being completed. What should be the future of the chemical and timber industry?

[Gusev] We are deeply convinced that the last 2 years of this plan and the 13th Five-Year Plan should be a period of scale, general reconstruction of productions on the basis of new technologies and modern equipment with creation of a system of direct increase of qualifications of personnel. We propose to introduce, on necessary scales, production of modern materials and the step by step realization of a policy of complete satisfaction of demand.

This approach is not only a long-term approach but is also oriented on more immediate tasks. Thus, in 1989-1990, we will be able to satisfy the demand for detergents, passenger car tires and newsprint. In the 13th Five-Year Plan, in accordance with the developed concept of development of the national economy, the social trend also will be continued. This means complete satisfaction of the demand for medicines, vitamins, many biotechnological products, furniture, dyes, timber and chemical fibers. The volume of production of modern materials is increasing up to the level which is typical for all developed countries. We must emphasize that the

development of industry will be carried out jointly with countries which are members of the Council for Mutual Economic Assistance. All of this will create conditions for significant increase of the volume of sales of our products on the world market.

Ecologically safe, highly productive, economically efficient enterprises which are producing items required by society and which give satisfaction and joy to the people; this is how we see our complex in the future.

INTRODUCTION OF NEW TECHNOLOGY

Nuclear Technology Facility Converted To Civilian Output

18010708 Moscow SOTSIALISTICHESKAYA INDUSTRIYA in Russian 1 Jun 89 p 4

[Article by I. Klimenko; "Magnets From A 'Post Office Box'"

[Text] Yet another former secret production facility has adopted a civilian name—the Moscow Polymetals [polimetall] Factory.

The first interview of the young (both by age and by experience) director, Valeriy KRYUKOV was with a correspondent from SOTSIALISTICHESKAYA INDUSTRIYA: Our organization is the foremost in the nation for the production of absorber elements for nuclear reactor control and protection systems. The collective has solid scientific-technical and production potential. But until recently our capabilities were aimed for the most part at the defense sector. Today in connection with the conversion we have begun to address civilian problems. We have created a marketing department and are looking for and establishing ties with potential partners, as well as with future consumers of the electrical consumer goods which are being developed.

And whose cooperation are you seeking?

We are seeking the cooperation of anyone who has ideas on the use of superpowered permanent magnets created based on rare-earth alloys such as samarium-cobalt, or neodym. We are capable of preparing magnets of any mass, configuration or strength. Anyone who is interested in our proposal is invited for a business discussion which we will be holding on the 28th of June at 10 o'clock.

But you are not so easy to find, Valeriy Viktorovich. Your organization is listed neither in the address bureau nor in telephone directories.

I will give the address: Kashirskoye Shosse, 52. The telephone number for inquiries is 324-89-06.

AGROTECHNOLOGY

Measures to Make Grain Growing a Priority in Agriculture

18240089 Moscow SELSKAYA ZHIZN in Russian 15 Mar 89 p 2

[Article by V. Loskutov, Moscow: "Grain of Your Own or From a Cordon?"]

[Text] At any time in history man has placed, places and for a long time to come will continue to place a priority for his existence on the availability of grain in storehouses. It would be impossible to count how many folk sayings, songs and proverbs there are about this most important product. At the threshhold of the CPSU Central Committee plenum on agricultural problems I would like to consider why the grain shortage exists and what must be done additionally so that our country can cease to be an importer of this product.

We know that in recent years we have done a great deal to increase grain production. A number of organizational, economic and technological measures have been taken. This has yielded some positive results. Still we are producing insufficient amounts of grain. This is attested to by a USSR Goskomstat [State Statistics Committee] report concerning 1988 work results which states that 36 million tons of grain were purchased abroad, basically feed grain. Moreover, imports have been in progress for many years now.

Naturally the question arises: What is hindering increased production of our own grain? An overall analysis shows that an effective system of measures is needed that will bring out a deep economic interest in solving problems in each agricultural worker, director and specialist, in all cadres of the agroprom [agro-industrial committee].

Unfortunately, this kind of interest does not always exist or exist everywhere. Many directors of enterprises utilize existing possibilities poorly to improve the branch. Little fertilizer is allocated for grains, the crop structure is not always determined wisely and some areas are involved in low-yield annual grasses. For these and other reasons the area in grain crops has decreased considerably. And the elevated procurement plan is not an accelerator but more likely a hindrance to grain production. After all, an adequate reserve of high-quality feed should always remain in enterprises for the intensive development of livestock raising. But the reserve is weak. This forces directors and specialists to produce more of the feeds that will remain in the enterprise for certain.

Other factors also decrease production. Existing procurement prices with supplements for livestock products are not equivalent to prices for grain. It is several times more advantageous to use grain as feed for livestock and then to sell livestock products than to sell grain itself to the state. It is no accident that kolkhozes and sovkhozes sell as little grain as possible to the state, often exhibiting dependence in this by requesting forage from state resources, which in the final analysis results in the need for imports.

The situation involving the cultivation of millet and buckwheat also attests to the absence of economic interest in increasing grain production. Procurement prices for these crops were increased more than once, the marketing of mixed feed was planned and despite this yields are increasing slowly, especially of buckwheat. This means that the mechanism that was developed is not effective. We need more improved economic, technological and agricultural measures.

In the country as a whole too little grain is still being produced per capita—only 730 kilograms. Yet in a number of socialist and capitalist countries this index equals 1.3-1.4 tons. This enables them to carry out livestock raising on a high level and to implement product exports. In this regard we must take into account the fact that our population is increasing by 2.5-2.9 million people annually, and it is supposed that by the end of the year 2000 it will comprise 313 million and possibly more. Thus it is completely correct that the party is putting forth as one of the central tasks in agriculture a significant increase in grain yield, and the satisfaction of demand for grain by means of our own production.

In accordance with the Food Program by 1990 250-255 million tons of grain must be produced. And we need not just a "gross yield" but hard and strong wheat, millet, buckwheat, rice as well as high-protein and feed crops. But even with this kind of volume less than 1 ton of grain will be produced per capita. From this we can draw the following conclusion: it is important to change not only the way of thinking of all cadres but also economic approaches in order to solve the problem in the shortest possible time.

The great demand for grain and instability in its production means that the country is greatly dependent on the world market. Prices are increasing. At the same time in our country they are still very low, especially for durum and strong wheat. The kolkhozes and sovkhozes of Orenburg, Saratov, Volgograd and many other oblasts sell soft wheat for 110-130 rubles per ton, and for a high level of quality the price is somewhat higher. Imported grain is acquired for approximately the same price with a consideration of delivery and shipment to different parts of the country. But enormous resources are directed to West European, American and Canadian businessmen and not to the Soviet people. I am convinced that if the procurement price for grain were increased today to a level that would allow profits from sales to be higher than if the grain were used as livestock feed, grain production would increase significantly already this year.

In other words, priority must be given to grain. Then there will be sufficient meat and milk. This means that a strong economic interest is essential, and not just an interest. First and foremost economic measures must be in effect—the use of rents, collective and family contracts, the development of the high feeling of manager of the land and also elevated procurement prices.

Immediately the question arises: Where shall we get the resources? Basically from among those resources that are expended for the procurement of grain abroad. We know that each year billions of rubles are spent on this. According to data from the Ministry of Foreign Economic Relations, in 12 years (1976-1987) over 36 billion rubles were spent to procure grain, with the exception of groats. Then why not allocate at least a portion of these resources into the hands of Soviet village workers, plant workers and machine designers and by means of this awaken additional interest in the rapid growth of our own grain industry?

We can find resources without special effort after critically analyzing the structure of all imports, including commodities that belong to the agroindustrial complex. I will mention just a few. Our country imports harrows, sowers, mowers, reapers, grain cleaning equipment, grain dryers and sprinkler equipment. Can it be that we ourselves cannot manufacture these? Or, over 1 billion rubles alone have been spent during the last 2 years to buy preparations for the struggle against pests. Yet what are our scientists and enterprises doing in this direction?

And another thing. Enterprises must be guaranteed the sale of high-quality mixed feed for preferential prices for the procurement of grain sold above the level established by the contract. The more grain above the contract the enterprise sells to the state, the more mixed feed it has a right to buy from the state at decreased cost. A direct proportional ratio will help in this. Today mixed feed is very expensive and this is why directors are not interested in selling grain to the state. Many kolkhoz chairmen and sovkhoz directors speak about this.

Right now there is no wholesale trade. Beginning in 1989 the allocation of deficit material resources must be implemented on a contract basis primarily for products. The principle, "If you sell to the state you receive resources from it," is called upon to be in effect. For example, that includes tractors, feed harvesting combines, trucks and cars, buses, building materials, pipes, metals and so forth. It is especially important to interest enteprises with material resources in return for buckwheat and millet. It is important that the state guarantee these resources.

The largest reserve for solving the problem is the knowledgeable use of unexhausted possibilities in the biology of agricultural crops, particularly corn. The possibilities of producing large yields of corn grain are well-known. Yields are 2-3 times greater than those for spike crops, and in dry years they are even greater. In recent years new rapidly-maturing hybrids developed both abroad and domestically have appeared. Industrial crops in many oblasts and on large areas have demonstrated excellent results even under the conditions found in the Urals and Siberia. Last year in Kurgan, Orenburg and Tyumen oblasts and the Bashkir ASSR under drought conditions dozens of kolkhozes and sovkhozes produced 80-100 quintals of ears of corn in the waxy stage of ripeness, and 50-100 quintals per hectare of the entire mass translated into feed units, whereas barley and oats yield only 8-10 quintals. Corn can be a good addition to the grain balance.

Tests and accounts show that corn can be cultivated using grain technology in the RSFSR alone on 12-13 million hectares and grain production can be increased to 50-60 million tons, and in the country as a whole—significantly more. And it is not at all obligatory that all of it be in dry form—ears can very successfully be used in the milky-wax or waxy stage of ripeness with a well-pulverized silage mass. It is important that corn be available and that it find its way into feed troughs.

In my opinion, we must without hesitation create a large cost-accounting association for the cultivation of corn and breeding and reproduction of rapidly-maturing hybrids. Since the yield of hybrid seed is significantly lower than of regular corn grain it is essential to develop additional economic incentives for all enterprises and scientific-research institutes involved in the production of this seed. Whereas at first there will not be enough rapidly-maturing domestically-developed hybrids in the country it is economically more advantageous to procure such seed instead of grain from abroad. As was done in Rovno Oblast, it is expedient to create joint ventures with foreign firms to produce rapidly-maturing hybrid seed.

It is time to finally solve the problem of manufacturing a complex of contemporary machines for corn cultivation and harvesting. This is one of the most problematic areas in agricultural promotion. After all due to the early schedule of corn harvesting and poor-quality grinding losses volued at billions of rubles are tolerated. This truth is know to everyone but the problem remains. Control over the manufacture of such machines should be established at the highest level.

I would like to hope that the ways to sharply increase grain and feed production will be thoroughly discussed at the Plenum of the CPSU Central Committee. It is these factors that are most important in developing adequate food supplies in our country.

Fertilizer Minister Assesses Industry

l8200345 Moscow SELSKAYA ZHIZN in Russian 4 May 89 pp 1, 2

[Interview with Nikolay Mikhaylovich Olshanskiy, Minister for Mineral Fertilizer Production by B. Sevastyanov: "Wherein Lies the Strength of the Plowland"]

[Text] Nikolay Mikhaylovich Olshanskiy is the Minister for Mineral Fertilizer Production. Perestroyka placed

him into this high-level post. He is 50 years old. He was born in the village of Drabov in Charkassy Oblast. He graduated from the Lvov Polytechnic Institute and the Academy of Social Sciences of the CPSU Central Committee. He passed through all the stages of engineering growth up to plant director. He has a great deal of experience in party work.

[Sevastyanov] Nikolay Mikhaylovich, you participated in the March Plenum of the CPSU Central Committee and you spoke there. Your arguments in favor of chemical fertilizers are well-founded. Thus we can draw the conclusion that the branch will continue to develop further...

[Olshanskiy] Before speaking about the prospects for the branch I would like to note that the high level of effectiveness of agricultural production depends not only on it. The effect of reclamation, mechanization, breeding and seed farming is indisputable. After all, they act simultaneously and are capable of supplementing each other.

It would be difficult to count on a high return per irrigated hectare if we sow it with a low-yield, nonregionalized variety and do not fertilize it, or if we fertilize abundantly but do not suppress weeds with herbicides.

But I think it is possible to make some qualitative assessments. Labor productivity in agriculture in economically-developed countries increased by 60 percent between 1900 and 1940. This growth is the result of mechanization and land reclamation.

During the next 40 years labor productivity in the agricultures of these countries increased elevenfold. The forestalling development of production and the use of mineral fertilizers, feed supplements, chemical agents for plant protection, growth regulators and soil reclamation agents had an effect.

We supply the village with over 28 million tons of mineral fertilizer annually. We supply 120 kilograms per hectare of plowland. Is this a lot or a little? Let us look at foreign experience. Bulgaria applies 180 kilograms, Hungary—250, Czechoslovakia—303, Belgium—almost 600, and Holland—800 kilograms. As you can see, we still have a long way to go before we catch up with them.

[Sevastyanov] Is it possible that we will have to enlarge capacities?

[Olshanskiy] I am not in support of the mindless expansion of capacities. The problem is much more serious. A balanced use of chemical fertilizers with organic matter, sapropel and peat is very important. We must start deoxydizing the soil immediately and properly. This work is being carried out poorly. This is why the area in acidic soils is not decreasing. Yet practical experience here and abroad shows that an uncomplicated method such as liming increases the effectiveness of using mineral fertilizers by 30-40 percent. This is equivalent to an increase in mineral fertilizer supplies to the village of several million tons.

[Sevastyanov] We are still managing the land poorly. We are not conserving its fertile strength...

[Olshanskiy] In many regions farming is being carried out under conditions of diminishing fertility and a lack of nutrient balance. This has resulted in the fact that humus content has decreased by 0.4 percent. And the main reason for this was the low level of organic fertilizer use. The proportion of organic fertilizer in total volume of nutritive substances applied to the soil is only 27 percent in our country, whereas in the GDR it is 45 percent, in England—49 and in the U. S.—61 percent.

The gap between the application of fertilizers and the means for protecting crops is large. In countries with developed agriculture 30-50 kilograms of these preparations are used per ton of mineral fertilizer. In our country only 13 kilograms are used. I feel that comparisons in kilograms do not reveal the true picture. Japan, for example, used a hundredfold more resources than we do per hectare for the chemical protection of crops.

[Sevastyanov] It turns out that in our country a significant portion of nutritive substances is consumed by weeds.

[Olshanskiy] If that were not enough, 25-30 percent of the possible yield is lost due to disease and pests.

[Sevastyanov] Can I understand you to mean that the branch is developing one-sidedly—many nitrogen and few phosphorus fertilizers and few plant protection agents. It is as if the branch has only one wing. I think that this stems from the fact that the gross index was used to assess the work of an enterprise. Is this also the reason for the poor assortment?

[Olshanskiy] It is difficult for me to give you a simple answer to this question. On the one hand we produce over 10 million tons of phosphorus fertilizer per year. On the other hand we still have a shortage.

The existing production level enables us to apply 740 kilograms of phosphate fertilizer per ton of nitrogen fertilizer. The assessment of our scientists in determining the optimal ratio fluctuates from 820 to 960 kilograms of phosphorus per ton of nitrogen. But foreign experience shows something else: for example, Bulgaria applies 560 kilograms of phosphorus, the U.S.A.—390, and some countries—even less. Throughout the world there is a tendency to decrease the proportion of phosphate fertilizers and to increase that of nitrogen. There is some kind of contradiction here. And I think that science, and first and foremost agricultural science, must deal with this.

After all we are striving to further develop the production of phosphorus fertilizers. But there are considerable difficulties involved in this. We have not found sufficiently promising sources of the raw material. We use imports. We pay for them, incidentally, with nitrogen fertilizer. And I must say that the gross index for assessing the work of enterprises did not have an effect here. After all the production of nitrogen and phosphate fertilizers is concentrated in various plants and is based on different technologies and raw materials. For this reason it is simply impossible to move from the production of one to the other.

I feel that the conclusion about the poverty of the assortment is not quite correct. We produce all of the fertilizers that are produced in the world—over 40 types. The average nutrient content in mineral fertilizers is 42.7 percent. Here we are keeping up with the times.

[Sevastyanov] And are our mineral fertilizers competetive in the world market?

[Olshanskiy] This is attested to by the fact that 60 countries procure them. It is another matter that we have greatly developed the complex fertilizers. Now we will retool the industry for the production of single types. We need more prolonged-action mineral fertilizers and we must optimize them with microsupplements.

Things are much more complicated here as concerns chemical plant protection agents. I have already spoken about the disproportions in production development and in the use of mineral fertilizers and these preparations. Agriculture requires 176 different types. But our industry provides only 100. We are forced to spend enormous amounts of money to procure chemical preparations abroad. And still we cannot yet fully satisfy farmers' demand.

[Sevastyanov] What is being done?

[Olshanskiy] A comprehensive program has been developed. It is planned to satisfy agriculture's demand for pesticides by 1995. But the matter is fraught with considerable difficulties. In order to produce new-generation preparations that are low in toxicity and that decompose rapidly in the environment we need complex technological processes and contemporary apparatuses.

And here an abnormal situation developed during the coordination of the location of these facilities. Local organizations do not agree to locate them in existing enterprises due to the ecological situation. New sites cannot be confirmed from above due to the complexity of the technology and the large capital investments. But the problem will have to be solved. The study of world experience shows that there is no other simple and inexpensive technology.

[Sevastyanov] You sometimes hear that the working of a particular source of mineral raw materials, the construction of a particular plant, the use of fertilizer or poisonous chemicals should be forbidden...

[Olshanskiy] Demands are even being made to close existing enterprises, to cease construction. Anti-chemical propaganda is found on the pages of newspapers and magazines. Moreover, sometimes the articles are not about the serious consequences of violating production technology and of the unskilful use of chemicals but in opposition to chemicals in general. All of this has given rise to a watchful and sometimes a hostile attitude to any directions in the chemicalization of the national industry.

Right now we are faced with a difficult situation. During recent years we have not been able to submit a single new plant construction site for approval. Our capacities are loaded. It is practically impossible to achieve an increase from them. We are surprised by the position of the directors of some regions. They constantly demand an increase in the supply of fertilizers and pesticides. But at the same time they forbid the construction and development of plants on their territory. This applies first and foremost to Odessa, Voronezh, Smolensk, Leningrad and Tambov oblasts and the Bashkir ASSR...And Latvia, for example, uses four times more fertilizer than it has the capacities to produce. Yet the republic does not want to renovate and develop production facilities. The same thing has been observed in Estonia, Armenia and Moldavia.

[Sevastyanov] I would like to touch on yet another problem. Everyone is as afraid of nitrates as of fire. Is the situation really that threatening?

[Olshanskiy] First let me speak briefly about what nitrates are. Nitrates are salts of nitric acid, a natural product in the life process of any plant. In plants they are transformed into proteins and amino acids that are essential for people and animals. What danger do they pose? When they enter the food of man nitrates can be transformed into the salts of nitrous acid—nitrites. In small doses nitrites relax blood vessels and decrease blood pressure. If they accumulate in excess they block centers for the transmission of oxygen and the body begins to suffocate. In this way, since man's existence is impossible without nitrates we can speak only about limiting them wisely. The problem is not as simple as appears at first glance.

[Sevastyanov] The speeches of the majority of authors create the impression in the reader that if we cease applying chemical fertilizers we will not longer have nitrates.

[Olshanskiy] In reality this is not so. There can also be a surplus accumulation of nitrates in places where only organic fertilizer is used. Moreover, this can occur under conditions in which fertilizer is not used at all. Today we

know of over 20 factors that affect nitrate content. For example, the infestation of plants with pests, diseases and weeds can sharply increase nitrate content without any fertilizers at all.

Here we must reflect on things. At the beginning of our discussion I mentioned how much chemical fertilizer is used abroad. I noted that the application of nitrogen fertilizer is being increased there at a forestalling rate. Moreover, considering the fact that in the FRG, England and Holland two or three times more organic fertilizer is applied than here, the plant receives a total of 5-6 times more nitrogen fertilizer there.

[Sevastyanov] Why has the nitrate problem arisen here?

[Olshanskiy] A contradictory picture is also developing within the country. In Belorussia three times more chemical fertilizer is used than in the RSFSR, let us say. Yet cases of elevated doses of nitrates in food products there, according to data from the USSR Minzdrav [Health Ministry], are fewer by a factor of 2 to 3.

We also cannot speak about the effect of fertilizer quality. We make fertilizer in the same facilities both for export abroad as well as for domestic farming.

I think that first, science must understand this problem more thoroughly and must study with greater precision what affects the surplus accumulation of nitrates. Second, and probably this is most important, we must simply use mineral fertilizers and pesticides knowledgeably. Both we and village residents must always remember that our mistakes and slackness bring harm to people and to the surrounding environment.

[Sevastyanov] It turns out that the matter lies in the quality of production, the technology for producing, storing and using fertilizers...

[Olshanskiy] If we judge by the degree of urgency, I would respond to your question in reverse. With all of our weaknesses we have learned to produce more fertilizer than anyone else in the world. But we do not always utilize it effectively.

In my opinion, due to the shortage of specialized technology and the violations of regulations for transport, loading-unloading operations and storage, fertilizer losses today equal 10-15 percent. With the existing delivery volumes this equals more than 3 million tons. Within the system of Soyuzselkhozkhimiya [All-Union Agricultural Chemical Association] fewer than half of storehouses correspond to sanitation standards. Moreover, there is simply nowhere to store over 17 million tons of fertilizer and toxic chemicals. Consumers unload and store them directly at railroad stations...And then let us look at the processing of toxic chemicals. The subdivisions of Selkhozkhimiya [Agricultural Chemical Association] are able to do only 10 percent of the work with these preparations. The rest is done by kolkhozes and sovkhozes. But how? With the great shortage of technical possibilities and of trained specialists things of course are bad. And where will specialists come from if agrochemistry is not taught at all in agricultural technical schools! Institutes train very few such specialists. Judge for yourselves—107 higher educational institutions each year graduate 62,000 agricultural specialists. Of these slightly more than 1,000 are soil scientists and agrochemists simultaneously.

[Sevastyanov] Nikolay Mikhailovich, what is your opinion of aviation?

[Olshanskiy] You probably mean agricultural aviation. How pilots distribute fertilizer and toxic chemicals gives rise to sad thoughts. First of all, quality suffers. A study in the RSFSR showed that 47 percent of area was worked unsatisfactorily.

Dusting machines have an especially low performance quality. Even now we have no applicators for the local application of chemical agents. As a result over half of the pesticides that are used are strewn into the atmosphere. The poor technology results in certain negative consequences—in a large overconsumption of agents, in pollution of the soil, water and food products and in the death of plants and animals.

As long as 7 years ago in our country sprayers with basically new disc, ventilation and valve dusters were developed and recommended for serial production. They could spray with a high level of biological effectiveness while decreasing the dose of pesticides by a factor of 2 to 3. The availability of such machines in enterprises would enable workers to sharply improve the quality of applying preparations, especially those bought for currency, and to improve working conditions for people. But these machines are still not being produced. This is what is hindering the mass introduction of ecologically-safe technologies.

Specialists feel sure that if mineral fertilizers are applied equally over an area of grains that it will be possible to produce additionally at least 26 million tons of grain. And the general increase in yield by means of developing an efficient storehouse industry, of supplying the needed technology for tranportation, processing and application of fertilizer can comprise about 47 million tons translated into grain terms. Thus we do have the possibilities for increasing the profitability of the means of chemicalization in our country...

[Sevastyanov] But the ecological danger—this is a reality, too many facts attest to it.

[Olshanskiy] I will not argue about this, all of our preceding conversation was about this. What does 3 million tons of lost mineral fertilizer mean? This is the amount that somehow got into rivers and lakes...And

then it was returned to us through our drinking water or by some other means. Many pesticides are not used as they should be because of poor technology and improper use.

I do not want to insult my colleagues but I must say that ecological damage is immeasureably greater during the use of chemical fertilizers and pesticides than during their production. I have spoken above about the use of mineral fertilizers and pesticides and about the level of agrochemistry. As for production, there is only one answer. We need waste-free, ecologically-pure technologies. On their basis it is essential to carry out the renovation and technical reequipping of existing plants. There should be no production without natural conservation structures.

An ecological program for the future has been developed and confirmed within the ministry. It encompasses all of the problems of natural conservation activities. And do you know what is hindering its implementation most of all? The struggle with chemistry, no matter how strange this seems. Due to this, as I have already noted, we now practically cannot introduce new facilities. Yet such facilities are being developed only on the basis of low-waste and resource-sparing technologies. Contemporary natural conservation objects are included in them. About one-third of the facilities within the branch were developed prior to 1970. They create 65-70 percent of the emissions into the atmosphere and about 85 percent of the sewage. It would be quicker to put them out of operation and to replace them with modern facilities. But construction encounters the opposition of the "fighters" for ecology. It is a vicious circle...

[Sevastyanov] Could you briefly describe the experience of creating an ecologically-clean enterprise?

[Olshanskiy] I think it would be more correct to speak about the ecologically harmless enterprise, about the kind that fits within the tolerable standards for man and the environment. We are gathering this kind of experience right now. Although not all problems have been dealt with finally, as an example we can present the Pervomay association, Khimprom [Chemical industry association]. Here a closed resource-sparing system of industrial water supply and waste processing has been developed and introduced. Many wastes which previously polluted the environment are now utilized; useful products are obtained from them.

It is satisfying to look at the blooming roses in Grodno's Azot Association. This is one of the largest enterprises for the production of fertilizer that is practically ecologically clean...

[Sevastyanov] Can the entire industry achieve this?

[Olshanskiy] It can and must! What is actually happening? During the past five-year plan we allocated 490 million rubles for the development of natural conservation objects. But local builders assimilated only 390 million rubles. But this, as they say, is for those "who remember the past."

What is the situation now? In 1986-1988 builders were to assimilate 385 million rubles. They did not achieve their quota.

I think that soviets must become actively involved in this, especially today, when construction management has been transferred to local organs.

[Sevastyanov] It seems to us that the chemical industry, and in particular the mineral fertilizer industry, is a branch into which incompetent people cannot be allowed. Wouldn't it be better if the responsibility for production, storage and use were put into the hands of one department? After all, we need an economic and ecologically-safe "plant to field" conveyor.

[Olshanskiy] At the plenum proposals were made to combine the scientific, production and technical potential of the corresponding ministries and departments into one specialized complex, and to point it toward solving the problems of increasing soil fertility.

I support these proposals. Moreover, we are already participating in improving the material-technical base. Thus, 62 storehouses for the storage of ammonia and liquid fertilizers have already been put into operation in oblasts by means of branch resources. Soon there will be another 16. This year our enterprises began to build storehouses for loose fertilizer in some rayon associations of Selkhozkhimiya. This is why we feel that we must join the efforts of plants and Selkhozkhimiya organs. Together we could not only create the necessary number of storehouses but also think about how best to carry out the design and production of modern equipment for applying fertilizer and toxic chemicals.

[Sevastyanov] Chemists are responsible for the harvest as much as farmers are. This is interesting! But underneath any responsibility there must be a material foundation. I know that during the 11th Five-Year Plan the return on mineral fertilizer, for example, was half the norm...

[Olshanskiy] It is true that the return on mineral fertilizer is still low. It comprises 75 percent of the norm. Before me I have data from USSR Gosagroprom [Agroindustrial Committee]. During the 11th Five-Year Plan the return on 1 ton of active substance in mineral fertilizer due to an increase in yield comprised 4.5 tons of grain units. In 1987 in the country as a whole this increase remained on the same level, unfortunately. The picture is very varied according to region. The increase ranges from 5.2 tons of grain units in Lithuania to 3.2 tons in Turkmeniya.

It has been noted that where the level of agrotechnology is higher, where there is a more serious attitude toward chemicalization this index is growing with stability. In the Ukraine the increase in grains by means of mineral fertilizers has increased from 4.5 tons during the 11th Five-Year Plan to 4.8 tons in 1987. In Belorussia the skilful use of mineral fertilizers has enabled us to increase their return by the increase in grains from 4 tons during the 11th Five-Year Plan to 5.1 tons in 1987.

And this is not the limit. On the basis of agrochemical research and agroclimatic potential it has been established that in our country with the application of 1 ton of nutrients in fertilizers it is possible to produce no fewer than 7 tons of grain.

[Sevastyanov] And another thing. Today, during the period of glasnost, is it easy to be a minister, to manage a branch such as the chemistry of mineral fertilizers? After all, it is in full view, everyone judges it by the quantity and quality of food...

[Olshanskiy] It is never easy for ministers. The responsibility is too great. And now, when the pain of the people is splattered across the pages of the press, it is especially difficult. After all, a finger is being pointed both justifiably and unjustifiably at the "bureaucratic apparatus" of ministries and at ministers individually. This problem is too extensive and serious to answer briefly. But in my opinion it is a shame that the ministry apparatus and sometimes ministers personally are blamed for the fact that they are against glasnost and criticism. This is not so. We support glasnost and criticism, but it has to be business-like, objective, just and honest. We cannot confuse glasnost with irresponsibility.

As for the specifics of the branch, I think that I have already answered this question. I am sure that there are no simple national economic branches. I would like to say a few words about the ministry apparatus. Of course under the new circumstances it is much more difficult for it to operate. All of us, from the minister to the operator, are learning to manage in the new manner.

There are still many obstacles on the path toward radical change in relations between ministries and enterprises, toward their transition to cost accounting. The subdivisions of the ministry could already today begin cost accounting relations with plants.

We must accelerate the development of a new resolution on ministries. Conferences and discussions with people and my personal experience convince me that the branch needs a central administrative staff. But its function must be different. It must be developed on an economic basis with enterprises and regions. I feel that it is time to liberate the ministry of the trifling guardianship of central organs, to give it real rights and full responsibility before the government for matters within the branch.

BUILDING MATERIALS

Problems With Dry Method of Cement Manufacturing

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No 4, 1989 pp 2-3

[Report by M.F. Bukhtin, deputy editor in chief of the journal TSEMENT: "Problems With the Dry Method of Cement Manufacture—Report on a Seminar of Chief Engineers of Enterprises of the Main Administration of Cement"]

[Text] In November 1988, a seminar of chief engineers of cement enterprises and of personnel of branch institutes was held at the Krivoy Rog Cement and Mining Combine on the topic: "Problems in Developing the Dry Process of Cement Production."

Representatives of USSR Gosplan and UkSSR Gosplan, Glavtsement, the editors of the journal TSEMENT, and other organizations took part in the seminar.

I.B. Udachkin, doctor of engineering sciences, deputy chief of Glavtsement, and general director of the NPO "Tsement," opened the seminar and presented the topic paper.

Representatives of branch institutes, cement enterprises, and other organizations took part in discussion of the problems of developing the dry process of cement production.

A.Kh. Drozhzhin, candidate of engineering sciences and chief engineer of the pilot plant of NIItsement, examined the basic lines of development of cement production in the country (see pp 6-8).

A.I. Zdorov, candidate of engineering sciences and deputy director of Yuzhgiprotsement, covered the questions of energy conservation in burning the clinker in kilns with cyclone heat exchangers (see pp 15-16).

A.M. Bogin, leader of the group of the burning laboratory of Giprotsement, spoke about the peculiarities in operation of kilns in the dry process (see pp 17-18).

A.N. Afanasyev, chief engineer of Orgproyekttsement, discussed the problems of operating the basic and auxiliary equipment at enterprises using the dry process, and he also shed light on foreign experience along those lines (see pp 8-10).

L.I. Tkach, candidate of engineering sciences and senior scientific associate of Giprotsement, devoted attention to the problems of preparing the exhaust gases from kilns used in the dry process for cleaning in static precipitators.

He noted that unfortunately systems for conditioning exhaust gases from high-capacity dry process production lines in cement production at the Novospasskiy and Navoi plants, the PO "Karagandatsement," and the Krivoy Rog Combine and other enterprises do not provide the necessary conditions for effective operation of static precipitators, since they have a number of fundamental deficiencies related to the impossibility of optimizing the moisture content and temperature of the gases and also to the difficulties in operating high-pressure spraying units.

On the basis of experimental results, the researchers have come to the conclusion that exhaust gases can be effectively cleaned only by separating the processes of cooling them and increasing their moisture. The gases could be cooled by installing in the gas duct a surface heat exchanger in which circulating water would be reheated. Some of the water would go to the heating system or for housekeeping needs, and the other would go to the gas duct in front of the static precipitator to add moisture to the exhaust gases. This scheme makes it possible to do without mechanical sprays, since the reheated water going to the gas duct is evaporated instantly.

No more than 40-80 grams of water per kilogram of dry gas are fed into this system, instead of the 100-200 grams in present conditioning systems. Losses of heat with the exhaust gases are thereby reduced and 7-10 Gcal of thermal energy are saved for recovery per hour, and the degree of cleaning of gases in the static precipitator increases. For instance, assuming a flow of 100,000 m^3 of exhaust gases per hour at a temperature of 350° C and initial moisture content of 40 grams per kilogram of dry gases, a surface heat exchanger with an area of 120 m^2 is required, assuming initial water temperature of 20° C and final water temperature of 120° C.

In this system, 25.4 tons of water would be circulating, and about 6 tons per hour are fed to the gas duct ahead of the static precipitator. The final temperature of the gas flow is 130° C.

In the speaker's opinion, this method of preparing exhaust gases opens up new opportunities in the area of configurations, which is of particular interest in connection with plant reconstruction. The opportunity arises of separating aerodynamic flows and facilitating the processes of controlling units at the same or even lower costs in terms of thermal energy.

The method proposed will be very effective at those plants using the dry process where the systems do not include apparatus to prepare exhaust gases for cleaning (the Katav-Ivanovsk and Slantsy Cement Plants).

The economic benefit from applying the new system (not including the benefit from environmental protection) would be about 85,000 rubles per year, according to the calculations of its authors, for a production line with a rotary kiln that is 4 x 60 meters in size.

V.I. Konovalov, chief engineer of the Rezina Cement Plant, shared his experience with operation of a new dry process production line, and he also discussed problems of its development and shortcomings that arose during construction of a second production line at the plant.

He said that everyone in the audience knows the difficulty with which the production line using the dry process has been introduced in our country. And yet the Rezina plant started up at once. What facilitated that? Mainly the fact that the management of the enterprise under construction was concerned about training the personnel, who were recruited from among the construction workers.

The reasons for the difficult activation of dry process production lines are the imperfect designs and bad equipment.

After the first line of our plant was started up, I wrote to Yuzhgiprotsement a thorough report which I addressed to A.G. Kisel, who then was the chief engineer on the project, and on that basis an official record was made of the defects detected, also including our request: that it correct them in designing the second line. But everything stayed the way it was.

The same issues are frequently raised over and over in our conferences. But over many years they are not resolved because there is no responsibility either on the part of the designers or on the part of the machinebuilders, and in the ministry there has so far been no leader who would tackle the solving of these problems.

Designing in our country is going poorly at present. For example, oversights in the design which Yuzhgiprotsement did for reconstruction of just the equipment of the plant's first production line cost 1.8 million rubles.

For some reason, the institute's specialists do not design displacement pumps with dry pits, so that operating personnel had to overcome difficulties "heroically" carrying them up.

It took me 8 years with the ministry's help to prove to Yuzhgiprotsement that a crane should be set up in the department for mills grinding the raw materials.

A trestle was designed at our plant for the unloading of aluminate clays, but no machinery at all was envisaged for it. The situation in drying the slag is the same: had we not built an additional gallery and if we did not keep two bulldozers there, the plant would come to a halt. The facility for storing limestone is still not in operation.

It is altogether impossible to put the second line into operation without solving these problems. But for some reason, this has to be proven at all levels—from the institute to the ministry.

E.R. Polishchuk, candidate of engineering sciences and senior scientific associate of Giprotsement, examined the particular features of processing and blending the raw material for the dry process of clinker production (see pp 18-19).

N.A. Ryabchenko, director of the Krivoy Rog Cement and Mining Combine, spoke about the ways in which the enterprise has developed and its problems (see pp 11-12).

P.N. Dmitriyev, sector head at Giprotsement, elucidated the problems of homogenizing the pulverized raw material at cement enterprises using the dry process (see pp 12-14).

V.D. Barbanyagre, candidate of engineering sciences and department head at BTISM, reported on development projects of the department's staff members to improve the transport-rheological properties of the pulverized raw material and cement.

V.I. Zharko, candidate of engineering sciences and chief specialist of USSR Gosplan, dwelled on the prospects and directions of development of the dry process of cement production in the country (see pp 4-5).

A.B. Bresler, scientific associate of NIItsement, examined the strategies for improving the technology of grinding cement in connection with the dry process.

G.A. Shabolev, chief engineer of the Katav-Ivanovsk Cement Plant, spoke about the enterprise's problems. He noted that in 21 years of operation of the dry process kilns the plant has been unable to reach their rated capacity.

Over the last 3.5 years, the enterprise has been operating stably, and we are not getting up to the rated capacity of 50,000 tons of cement per year, while the output plan in 1988 was 1.5 million tons.

An extensive organizational and technical effort has contributed to the enterprise's stable operation.

For instance, in the compressor department most of the units were replaced with improved units, one of the four furnaces which are 4 x 60 meters in size was rebuilt and the cyclone heat exchangers were modernized, and a second is being readied for reconstruction, one of the mills that is 3 x 12 meters in size is being replaced by a mill that is 3.2 x 15 meters in size, and another is being prepared for replacement. Of what was originally designed for the crushing department, there remains only the jaw crusher, while everything else has undergone reconstruction or has been replaced. Other projects have also been carried out. Giprotsement has been very helpful to a plant's collective in this regard.

As has already been stated here, departmental repair enterprises cannot meet our demands for reconstruction of equipment, since they have small capacity.

That is why we did the reconstruction of one of the kilns entirely ourselves, using the personnel of the machine repair shop. The machinebuilders did not deliver a single cyclone, a single gas duct, a single chute, or a single shut-off valve to us.

That reconstruction project took, of course, many personnel for a long time, which adversely affected attainment of the plant's rated capacity.

We would like it very much if the reconstruction of equipment were done by specialized repair enterprises together with the machinebuilders of the PO "Volgotsemmash."

L.B. Katsman, scientific associate of Yuzhgiprotsement, analyzed shortcomings in automation of the first production line at the Rezina Cement Plant as well as problems in organizing the designing of automated systems and the aggregate supply of equipment.

The participants in the seminar observed operation of the production line of the Krivoy Rog Combine furnished with the reactor-decarbonizer.

Unfortunately, only three production specialists spoke in the seminar. Papers that had been planned were not delivered: by the chief engineer of the Nevyansk Cement Plant, where a new dry process production line was recently activated; by associates of SibNIIproyekttsement on preparing the mixture of raw materials with the given chemical composition at the Nevyansk plant; by the general director of the NPO "Soyuzstromekologiya" on applying promising dust-catching devices. And a paper by personnel of the VNPO "Soyuzavtomatstrom," which is to provide for automation of the production lines using the dry process, was not even planned.

Representatives of the NPO "Volgotsemmash," the principal developer and supplier of equipment for the dry process of cement production, did not even take part in the seminar.

We must also be sorry that the seminar adopted no recommendations aimed at correcting the present deficiencies and at further development of the dry process of cement production, and as a consequence, as was noted by certain speakers, the shortcomings which have been exposed travel from one new production line to another.

Indeed, the seminar itself was convened without the necessary preparation. Although Glavtsement had planned it long before, it notified people of the date when it would be held only a few days in advance.

Of course, such measures have to be prepared more thoroughly and conducted not just for the sake of a report, but in order to efficiently correct the shortcomings discovered and solve the problems that have arisen.

Energy Saving Using Dry Method of Making Cement

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[Article by A.I. Zdorov, candidate of engineering sciences, Yuzhgiprotsement (South All-Union State Design and Scientific Research Institute of the Cement Industry): "Energy Saving With the Dry Method of Making Cement"]

[Text] Designs of Yuzhgiprotsement[1] and Giprotsement were used to build new production lines for the dry process of production with a productivity of 3,000 tons of clinker per day in each line. It is natural that the technical features should be distinct from one another as one goes from one phase to another of the plants. Nevertheless, a thorough analysis of them allows us to take note of a number of general trends that have great importance. They include the following:

- reduction of energy losses in all stages of the production process, including use of the heat of exhaust kiln gases to dry the raw material and use of the hot air from the cooler for preliminary decarbonization of the pulverized raw material (Krivoy Rog Combine);
- combination of various processes in a single unit: the drying and grinding of the raw material, drying and crushing of the raw material (Novokaraganda plant), primary and secondary crushing of the carbonate component (Krivoy Rog Combine), and crushing and movement of the raw material in mobile crusher units;
- substantial increase in the speed of production processes in all phases;
- introduction of continuous types of industrial transport, especially for delivery of the raw material from the mine to the plant (Navoi plant);
- elimination of direct human participation from the production process (mainly operator functions are left to him and participation in attending the equipment);
- the increase in the unit capacity of basic units in all phases of production.

Yuzhgiprotsement considers further energy conservation in burning the clinker using the dry process possible by using efficient technologies.

More than 10 years ago Yuzhgiprotsement departed fundamentally from the traditional method of designing the composition of the raw material mixture delivered for burning. Research conducted on the third production line of the Lipetsk plant showed that the presence of high-aluminate clay, because of the peculiarities of the

thermal preparation of the raw material in the system of cyclone heat exchangers, has an adverse effect on the burning of the portland cement clinker and on its activity. Instead of high-aluminate clay, granulated slag from blast furnaces began to be included in the mixture of raw material; the pyrophysical characteristics of the slag guaranteed improvement of the homogeneity of the material at the entrance to the rotary kiln, its granularity, and reduction of the level of the maximum temperature in the caking zone. This made it possible to substantially increase (by 5-9 MPa) the activity of portland cement clinker at the Navoi Cement Plant, where ash-slag waste from the Angrenskaya GRES has been included in the raw material mixture instead of kaolin.

In the period 1987-1988, two technogenic products were simultaneously included in the mixture for the first time at the Rezina plant: blast furnace slag and ash-slag waste from the Moldavskaya GRES.

A distinguishing feature of the research conducted jointly with the Rezina plant is that it came as close as possible to real production conditions—every stage of the work was checked in the process of full-scale tests, and the positive results became the basis for moving on to the next stages. Within 1 year, we reached the level of the final full-scale test of a scheme that had been fully worked out, having in that relatively short period of time executed about 20 chemical-technological tasks of varying degree of complexity.

The optimum ratio of these components (2:1) guarantees attainment of the highest level in the branch for the basic operating indicators of the kiln unit and a 10-percent reduction in fuel consumption to burn the clinker in tests. At the present time, the technology is being refined jointly with the plant.

We can expect that in the years immediately ahead the individual approach to each specific situation may be applied in other production lines using the dry process of cement production.

The "R-burning" technology, developed by Yuzhgiprotsement jointly with the MKhTI imeni D.I. Mendeleyev, has been in continuous operation since October 1981 in the third production line of the Lipetsk plant, which has a kiln unit that is 5 x 75 meters in size and cyclone heat exchangers. The essence of this technology lies in a low-caking mixture of raw materials being fed from the loading end of the kiln for burning and a portion of the finely ground endothermic component necessary to bring the clinker up to the given composition is added to the caking zone from the unloading end.

During the period of operation of the "R-burning" technology in a temporary mode over 4 years and under actual operating conditions of the plant, 3.7 million tons of high-quality cement have been produced with a higher activity than that of ordinary clinker. The additional output of the binder during this period was 110,000 tons. The productivity of No 3 kiln rose 17 percent, and, as comparative tests have demonstrated, specific consumption of standard fuel dropped 15 kg per ton of clinker. The resistance of the lining of the kiln unit was 300 days.

Experience in using the "R-burning" technology at the Lipetsk plant demonstrated that the indicators achieved could be considerably higher, but this would require installing a permanent scheme for speeding the components in separately.

The experience of working with the "R-burning" technology and the physicochemical tests that were run allow us to assert that its use guarantees a reduction of specific fuel consumption to 10 kg per ton of clinker as compared to any base level of present-day equipment, including production lines furnished with reactor-decarbonizers. The institute recommends broad introduction of "R-burning" at present plants using the dry and wet processes in permanent production schemes.

It is especially important to use this technology in the dry process production lines at the Rezina, Navoi, and other plants equipped with kilns 6.4 meters in diameter, one of whose operating shortcomings is the low resistance of the refractories in the caking zone.

With the help of the PO "Volsktsement," Giprotsement, and BTISM, Yuzhgiprotsement has created a new remote-controlled gas-mazut multichannel DGM burner. It has been installed on the 5 x 135-meter kiln of the "Bolshevik" Plant, and in 1987 it was submitted to a departmental commission. The burner operates separately for gas, mazut, or a mixture of them with the following rates of consumption: about 12,000 m^3/hr for gas and 11 tons/hr for mazut. When mazut is used, primary air is fed from an air turboblower at a rate of 9,000 m^3/hr.

The DGM burner is installed on special mounts which guarantee its angular deviation to within 2.5° in either direction and are fastened to the truck, making it possible to regulate movement along the axis of the kiln, and the entire device can be rolled out. Operation of the burner over 15 months shows that in addition to eliminating time losses in conversion from one type of fuel to another, the DGM affords the possibility of localizing insufficient preparation of the material without slowing down the furnace, while consumption of primary air is reduced and electric power is saved. The device has demonstrated its high operating reliability, and the economic benefit from its use is about 60,000 rubles.

A comparison of the technical-and-economic indicators of the DGM with the gas-mazut devices of the firms "Smidt," "Lafarge," and others made it possible to establish that it meets the level of the best world examples.

The DGM burner of the appropriate size-type can be applied, say, at the Krivoy Rog Combine instead of the burner from the firm "Unitherm" (Austria), as well as on other kilns using the dry process.

Unfortunately, the PO "Volgotsemmash" has been persistent in not accepting our burner for introduction, and it is developing its own design.

At the Balakleya and Bakhchisaray Combines and the Kamenets-Podolskiy and "Proletariy" Plants, systems have been applied which were developed by Yuzhgiprotsement to preserve and utilize heat with devices for using secondary energy resources (VER) of rotary kilns.

The device for using the VER of kiln housings, adopted by an interdepartmental commission in 1987, affords the following possibilities:

- to utilize secondary heat in the form of hot water at a temperature up to 100° C in the amount of 12,000-20,000 Gcal/yr depending on the size-type of kiln;
- to reduce heat losses of the kiln housing and to save fuel in burning the clinker in the amount of 1,000-2,000 tons of standard fuel per year;
- to increase the life of the furnace lining by 50-150 days;
- to do without operation of boilers in the summertime.

The water obtained in the devices at a temperature up to 373 K can be used to prepare the slurry, to feed boilers, for direct heat supply to the cement plant and asbestos-cement sheet production, and also to heat greenhouses and fish pools, to obtain cold water in areas with a warm climate using lithium bromide absorption units and air conditioning.

Under the ordinary conditions, the housings of 4 x 60-meter kilns using the dry process and 5 x 185-meter kilns lose into the environment 15 and 20 MJ/m^2/hr, respectively. Our device makes it possible to reduce heat losses to 3.6-1.8 MJ/m^2/hr.

The "YuGTs-VER" devices are reliable, they do not make it more complicated to attend the rotary kilns, but they do necessitate technical habits in their operation. As to design, they are made of prefabricated metal sections which are installed on a support frame around the furnace even without shutting it down and they can be disassembled section by section when the kiln unit is undergoing repair or overhaul. Complicated metal fabrications and expensive scarce materials are not used in manufacturing the "YuGTs-VER" devices. Metal consumption per device for a kiln that is 5 x 185 meters is about 80 tons.

Use of the "YuGTs-VER" can be recommended on kilns of all types and sizes at temperatures on the surface of the housing of at least 140° C in both the wet and dry processes of production, but also in the chemical, metallurgical, and other branches of industry.

As experience has demonstrated, in proper operation the cost of installing an additional heat supply system for plants and units is paid off in 1-2 years.

For reliable heat supply of a cement enterprise which has several devices to recover VER, it is sufficient to have a small boiler plant with peak water heaters in which circulating water is additionally heated for a short period of time during the coldest period of the heating season. The water heaters of the boiler plant used in peak periods are also reserve sources of heat should the kilns be shut down or undergo repair. There is a real possibility of entirely eliminating fuel consumption to obtain hot water in the summer, which means that the boilerrooms can be shut down. Further application of the "YuGTs-VER" is being held up by the lack of due attention on the part of Glavtsement to the problem of using secondary energy resources.

The institute is ready to extend aid in applying the innovations we have enumerated, and this may also be in the chemical, metallurgical, and other branches of industry.

In addition, we should list the following developments of Yuzhgiprotsement:

- a method of improving the transportability of pulverized material and cement using a porous metal instead of the fabric known as "Belting" (jointly with BTISM). It guarantees higher operating reliability of the equipment. The economic benefit is about 50,000 rubles for an enterprise thanks to reduction of the number of repair shifts;
- a sampler of bulk materials taken from a moving flow that is not under pressure; it offers an economic benefit of 30,000-40,000 rubles because of timely regulation of the batching of the initial components;
- a feeder-batcher of loose materials with productivity from 2-3 to 10-15 m^3/hr, designed for feeding ash, pulverized coal, and other materials.

The institute is ready to extend aid in application of the innovations enumerated.

Footnote

1. Associates of the institute V.L. Bernshteyn, M.V. Babich, R.M. Dzvonkovskiy, A.A. Glozman, L.T. Vorobeychikov, and others, have taken part in the projects concerning the problem.

Changes in Consumers' Living Standards Analyzed

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[Interview with A. Kormilkin, chief of the social planning sector of the AUCCTU, by V. Karpov: "From Payday to Payday: How To Prevent the Drop in the Standard of Living?"; date and place not given]

[Text] In the article entitled "Three Hundred Rubles 'Net,'" published 30 October of last year, and in readers' responses to its publication, certain acute questions have been raised having to do with the dynamic behavior of the standard of living of a Soviet individual and his social protection. Today, our correspondent talks on this topic with A. Kormilkin, chief of the social planning sector of the AUCCTU.

[Karpov] Many readers complain in their letters that they are having a hard time making ends meet, that they are living from payday to payday. Sometimes the letters sound even an outright desperate note....

[Kormilkin] Let me say that we also receive quite a few such letters. The restructuring of the economic mechanism has not yet solved the main problem—there have not been any shifts as yet in the social sphere. I am referring to the market for consumer goods, to working conditions, and also to the quality of education, health care, and pension coverage....

An analysis of the dynamic behavior of real personal income affords a fuller idea about the standard of living. At the beginning of the seventies, the rates were still high. Then they began to drop, and so far success has not been achieved in stopping it.

The standard of living is, of course, influenced also by the uncontrolled rise of prices, which has been particularly noticeable in the recent past. Retail prices have risen substantially, as we have been able to see for ourselves, not only on luxury items, but also on necessities and staples. The prices of the latter have risen almost one-third since 1970. But that is the average. Meanwhile, sausages, fruit, and berries have become 1.5-fold more expensive (some types of sausages have tripled in price after having migrated for some reason entirely and completely to the shelves of consumer cooperatives) and vegetables and melons have gone up 60 percent.

The table below contains the average prices of purchases made by workers and employees in state and cooperative trade as presented by USSR Goskomstat. The figures show the cost to the consumer in the relevant year per kilogram of the particular product. The prices are given in rubles:

	1970	1980	1985	1986	1987
Beef	1.97	2.17	2.36	2.41	2.49
Mutton	1.75	1.96	1.90	1.95	1.93
Pork	2.06	2.32	2.33	2.38	2.42
Sausages	2.44	2.76	3.10	3.28	3.56
Fish and fish products	0.97	1.35	1.24	1.24	1.27
Potatoes	0.13	0.15	0.15	0.16	0.18
Vegetables and melons	0.29	0.39	0.40	0.42	0.46
Fruit and berries	0.85	1.14	1.27	1.19	1.26
Candy	2.50	3.02	3.44	3.48	3.42

The prices of industrially produced durable consumer goods have been rising still more rapidly. The index of average prices for the commodity group of durable consumer goods and housewares, according to our calculations, stands at 138. Prices of nonfood goods as a whole have risen almost 40 percent.

Although the share of transportation expenditures in family budgets has dropped, fare schedules have risen—for taxis they have more than doubled and they have risen 182 percent in river transportation, 172 in maritime transportation, 123 percent in air transportation, and 103 percent in rail transportation. At the same time, we have to face the truth, the quality of service has not improved at all, and in some places it has even gotten worse. The lateness of trains and flights is not seen as anything special, but as a normal phenomenon. Neither Aeroflot nor MPS are financially liable to the passenger, as is customary in many countries. What is more, the railroad people are now bombarding the AUCCTU with demands that it consent to a rise in subway fares.

The cost of staying in hotels has increased by two-thirds with practically no change in the quality of service. Organizations engaged in rendering so-called nonproduction types of consumer services are very ready, it has to be said, to resort to this way of improving the results of their economic activity. Who at this point is not aware of the general desire to convert baths to the category of saunas wherever possible, thereby increasing the cost of a ticket correspondingly. It is the same with hairdressers, they are all changing their names to salons without any justification whatsoever. These conversions have raised the rates for using the baths 1.6-fold and hairdressing services 2.4-fold.

[Karpov] But our country is not the only one where prices are rising.

[Kormilkin] Quite right. They are seen to be rising both in the socialist countries and also in the West. In the United States, for example, according to American figures, they have crept upward in recent years at faster rates than in our country (since 1980, 38 percent and 14 percent, respectively). However, as specialists have been saying, in terms of the standard of living the USSR still lags behind the United States and indeed the other capitalist and many socialist countries. What is more, a number of scientists estimate that with respect to this indicator the Soviet Union is now somewhere in the interval between 50th and 60th place, falling behind a number of countries of the Third World. We will leave the accuracy of these computations to the conscience of the authors, but it now seems to be clear to everyone that we are not near the top.

[Karpov] How can you explain the situation that has come about?

[Kormilkin] The reason is that in the United States and other countries there is a special economic mechanism that makes it possible to automatically regulate the level of income, including old-age pensions, disability payments, and other types of social security benefits, depending on the rise of prices. That mechanism is based on what amounts in general to simple monitoring of the cost-of-living index, which is calculated on the basis of the so-called "market basket." Prices have risen, but so have wages, benefits, pensions, and scholarships, if not immediately.

[Karpov] Much is now being said about the "market basket." The AUCCTU has also taken part in developing it. Could you tell us about this effort in more concrete terms?

[Kormilkin] First, let me spell out what the "market basket" is. This is a specifically chosen group of basic foodstuffs, nonfood commodities, and services which affect the standard of living. Their cost is, of course, taken into account. Here again, public statistics on prices and costs are unconditionally necessary.

Now about the effort that has been made in the AUCCTU concerning the "market basket." This is the method: On the basis of budget surveys of the families of workers, employees, kolkhoz members, and pensioners conducted by USSR Goskomstat, a study is made of the entire spectrum of income for each of the family members. But particular attention is paid to those which have less than 50 rubles per month per person, those between 50 and 75, those between 175 and 200, and those over 200 rubles.

The "basket" includes 105 different services and commodities. Including foodstuffs (54 designations), nonfood commodities (41), and services (10). Both commodities acquired in state and cooperative trade and those obtained on the kolkhoz market are taken into account. Data on all the republics are collected for analysis so as to take into account regional features. The data obtained are compared to the standard rates of consumption in effect.

[Karpov] What have the studies shown?

[Kormilkin] I would note first of all that by comparison to 1970, which was taken as the starting point in the reckoning, there has been an increase in the consumption of practically all basic foodstuffs except for bread and rolls. For instance, whereas in 1970 per capita meat consumption was 47.5 kg, in 1987 it was 64 kg. People are buying more milk, cottage cheese, eggs....

As the analysis indicates, a predominantly carbohydrate pattern of nutrition has taken shape in our country, consisting mostly of bread products, hulled and rolled grain products, and potatoes. At the same time, most of the advanced countries in the world have long ago made the transition to protein-vitamin patterns with a high content of products of animal and plant origin in the diet. There obviously are also very substantial differences in consumption from one region of our country to another. For instance, in the Baltic republics and Belorussia in 1986 they were even buying more meat than called for by the standard rate given in the Food Program, which was calculated for the social-demographic conditions in 1990. At the same time, real consumption in Central Asia and the Transcaucasus has been lagging substantially behind the optimum rates. Here, we cannot fail to take into account that the share of purchases on the kolkhoz market is rather high. At considerably higher prices, of course (according to figures of USSR Goskomstat, in 1987 the prices of the kolkhoz market were 2.7-fold higher than prices in state and cooperative trade). Thus, the inhabitants of Georgia, when they buy food on the market, spend on the average for the year 131 rubles more than if they bought the same goods in the store.

The analysis has shown that food consumption in families that are not well-off is far below the standards. And the process of "washing out" inexpensive goods hurts them the worst. To cap it off, as a rule families with a low level of income do not have access to all the various preferential sources of goods. For instance, whereas in well-off families (with more than 200 rubles per person per month) a kilogram of meat products costs 2 rubles 71 kopecks, for the poor, with an income of less than 50 rubles, it costs 2 rubles 48 kopecks. So much for "social justice."

[Karpov] But why have the trade unions, which are expected to protect the interests of the workers, remained aloof from the problems of the standard of

living, prices, and income? Why is it that they have only now begun to study the "market basket" and to set up a mechanism for protecting the workingman?

[Kormilkin] The criticism is valid, it is hard to dispute the point. But let us look at things realistically. In the twenties, we had a mechanism for the interaction of prices and wages. But then we began to gradually forget about it, indeed we gradually even stopped informing the public about real changes in the cost of living.

The method we have recently used to determine the dynamic behavior of the cost of living has not reflected the real state of affairs, since it was not oriented toward the ever growing role of negotiated prices and other types of prices. The figures published on commodity sales and the cost of goods were incomplete, only a limited group of commodities were taken into account. Figures on rate schedules for paid services were "secret," and not all of the information supplied could be believed.

[Karpov] What specifically are you referring to?

[Kormilkin] For example, according to the figures of USSR Goskomstat, between 1970 and 1986 the price index of leather, cloth, and composite footwear was 98 percent; that is, these commodities seem to have become less expensive. But can we the consumers believe anything of the kind? Calculations show that the real rise of prices of those goods was 151 percent. The lack of reliable data has hindered and now hinders determination of the true nature of inflationary processes and the minimum threshold of the cost of living.

Unfortunately, even the very capabilities of the trade unions were rather limited during the stagnant period. Now, the situation has changed essentially—information previously inaccessible is being brought out, the trade unions have a right to make a more energetic effort in fact, not just in words. Today, the AUCCTU has decisively objected to all attempts to revise prices which could result in a deterioration of the material situation of the workers.

In order to give light industry greater motivation to increase the production of goods for children and the elderly, on the initiative of the trade unions the government has established benefits for that purpose. For its part, the AUCCTU has allocated 150 million rubles for that purpose from its own budget.

[Karpov] But still, let us look at things realistically. The situation is such that you cannot solve all the problems of the standard of living by any individual steps, however effective they may be.

[Kormilkin] I agree. We need fundamental new approaches. It is above all a question of what we call social standards in all spheres of our life, and the trade unions are trying to get them established. To be specific, every able-bodied man must have a job, but not for more than 40 hours per week, and he must obtain housing (a separate apartment or a house). He must have a minimum to live on—a monthly income that guarantees the possibility of obtaining the necessary group of foodstuffs, commodities, and services. He must obtain the necessary medical service where he lives, and must have at least 18 days of paid vacation.

The consumer budget should be the backbone of the entire system of social standards, in our opinion. The minimum wage, minimum pension, minimum scholarship, and the entire system of state benefits should be "linked" to it. It goes without saying that the social standards of, say, personal income would be reassessed so as to take into account inflationary processes.

The trade unions will be working for assessment of changes in the price index and adoption of effective measures which do not allow the standard of living to drop. In doing this, we insist on surveys being conducted at least once a quarter. It is very important to publish figures on the dynamic behavior of the cost of living for the general public.

[Karpov] How do you yourself see the practical effect of the system of social welfare?

[Kormilkin] A few year ago, scientists considered the minimum income per person to be at the level of 75 rubles per month. Consequently, pensioners and scholarship recipients receiving less than that amount must be given supplements by the state, and in the case of those who work (assuming, of course, they are not shirkers) this should be done by the enterprise. The AUCCTU believes that special standards have to be established by legislation and that this must be done before the drafting of the 5-year plan begins. They should become both a criterion for evaluating the level attained and also an instrument in the distribution of resources—the national income, capital investments, among sectors and regions. In that way, we could manage personal income and the supply of commodities, services, housing, hospitals, schools, kindergartens, and clubs.... In our view, this would be a real step toward implementing the social welfare policy proclaimed by the 27th party congress.

POLICY, ORGANIZATION

Trade Minister on Alleviating Food, Goods Shortages

18270103 Moscow PRAVDA in Russian 23 May 89 (second edition) p 3

[Article by K. Terekh, USSR minister of trade: "A Question For the Minister: Trade and the Shortage"]

[Text] *I am turning to you in the hopes of receiving a reply to numerous questions which the voters have posed to me. For four years now, we have talked about the food problem being the most important one; however, there is*

no more produce on the counters because of this—although I know that my fellow-villagers produce more of it from year to year. It is just as difficult to explain why one cannot buy a good suit, beautiful shoes, and a smart dress length—and now difficulties have arisen with soap, detergents, blades....

When will people finally be able to calmly acquire in stores what they need for a normal life?

Respectfully, Olga Lukyanenko, livestock specialist on the Svitanok Kolkhoz in Volyn Oblast's Manevichskiy Rayon and USSR People's Deputy

Yes, today there is perhaps no more acute problem than the shortage problem. Voices are ringing out that the trade workers are mainly guilty of these misfortunes—that they have almost created the shortage. I do not deny that we have enough defects and problems; however, the cause of the shortage is more complicated.

Last year, for example, an exceptionally high increase in the sale of goods characterized trade. The 1987 level was exceeded by 25 billion rubles. Such a large increase had not occurred during all previous years. For all that—no matter how paradoxical it may seem—the situation worsened in the consumer market. However, it could hardly be otherwise if one considers that the population's income during that same 1988 exceeded the planned level by 20 billion rubles. Add to this the 49 billion rubles, which have been freed among the population since 1985 in connection with the reduction in the sale of alcoholic beverages, and much will become clear.

With the increase in the population's monetary income, you see, the light and food industry was unprepared for such a rapid increase in consumer demand. Moreover, a number of enterprises, which had shifted to complete cost accounting, began to displace the production of many goods needed by the population, generally speaking. I will cite only one case. Last year, light industry increased the output of its products by 4.3 billion rubles; however, it reduced the production of goods selling for moderate prices by 2.1 billion. First and foremost, these were goods for children and retirees as well as items of the youth variety. Thus, during 1988, the output of children's overcoats selling for 25 rubles was reduced by 17 percent; that of woolen dresses and trousers selling for up to 11 rubles—by 14 percent; that of low quarter shoes and pumps selling for up to six rubles—by 11 percent. True, in protecting the population's interest, the state has been providing industry since the beginning of this year a subsidy amounting to 1.3 billion rubles in order to compensate for the additional expenses in producing inexpensive goods for children, youth and the elderly. The production amounts of these items are included in the state order; however, time is needed to saturate the market.

The task has also been complicated by the fact that mass demand goods have not been supplemented by imports because freely convertible currency has practically not been earmarked for these purposes during recent years. Moreover, industry failed to provide the trade system with goods worth 9.3 billion rubles, not counting alcoholic beverages, in 1987; worth 3.7 billion rubles—last year; and worth 2.7 billion rubles— since the start of this year already. The insufficient production of goods has had to be compensated for by reductions in stocks; in comparison with 1985, stocks have been reduced by almost 15 billion rubles. Although this process has managed to be halted, trade cannot work from a conveyer belt. The interruption in goods, lines, speculation, and rush demand proceed from here.

There are grounds for assuming that those, who are trying to damage restructuring in this way and to discredit its noble goals and positive results, are creating the "explosions" in consumer demand. Recall how several years ago an acute shortage of bedclothes was experienced in the market and then followed by a glut. Now, soap and detergents have suddenly become a serious problem. People have already begun to buy up matches and salt in some regions. In Moscow alone, for example, from 300 to 600 tons of detergent a day are being sold at a time when 80 tons are normally sold. Have Muscovites indeed begun to wash fivefold more frequently?

During 1988, 14 percent more soap and detergents were sold than during 1987. Detergent stocks have now been increased another 20 percent. More than 200,000 tons of washing powder and 47,000 tons of toilet soap have been imported for this purpose. Energetic steps are being taken to increase detergent production in our industrial enterprises. This should permit removing this problem from the agenda in the near future.

A sharp increase in the sale of sugar, confectionery items, fruit juices, and several other food products, which are frequently used in moonshining, occurred during the second half of 1986. Trade in sugar is being carried out with coupons practically everywhere. Local agencies were forced to take this step in order to shut off the channels for its mass purchasing by moonshiners and speculators. Present stocks permit sugar to be sold to each inhabitant at almost the 1985 level—a time when it was on sale without interruption.

The elimination of the defects in the struggle against drunkenness and alcoholism is also lessening the strain on the " sugar market." In particular, the sale of liquor and vodka items in 1989 has been restored to the amounts provided for by the 7 May 1985 USSR Council of Ministers Decree "On Measures To Overcome Drunkenness and Alcoholism and Eradicate Moonshining." The sale of dry grape wines, champagne, cognac, and beer in food stores has been permitted. This, of course, does not mean a retreat from the policy that was adopted

to overcome drunkenness and alcoholism. However, administration by mere injunction and prohibition is only capable of giving birth to other negative phenomena.

Today, the task has been posed to eliminate the urgency in the consumer market during the next two years. The decisions of the March 1989 CPSU Central Committee Plenum state how this will be solved with respect to food. The shortage problem in non-food goods will be solved by radically reconstructing and re-equipping existing light industry enterprises and by redirecting many enterprises in other branches, including the defense complex. Through a structural reorganization of imports, goods worth an additional five billion rubles will be purchased during the current year. Next year, it is planned to increase the output of non-food goods by no less than 49 billion rubles in comparison with this year.

The role of local and republic agencies in saturating the market is great. You see, enterprises of republic and union republic subordination produce almost half of all non-food items. It is on the oblispolkoms that responsibility has been placed to balance the population's monetary income with its expenses and retail commodity turnover with commodity stocks. However, many oblasts are basically spending their energy and strength on writing requests to the center about allocating additional funds. They are even requesting goods which can be completely produced in the local areas.

The further expansion of production cooperatives, the use of industrial waste and sub-standard items, and the expansion of commission sales should become a significant source for replenishing commodity stocks.

Last year, the network of state stores sold goods worth 1.1 billion rubles, which were manufactured by cooperative and individual labor activity; 256 million rubles of workable waste was sold; and commission turnover grew by a third and reached six billion rubles. However, this is not much in view of the present shortages.

The population's demand for lumber and building materials grew in connection with the increased individual housing and dacha construction. The annual increase in the sales of this commodity group has already reached 15-20 percent. Nevertheless, the demand is not being fully satisfied. Despite this, these items are often removed from the market in the local areas and directed toward other needs.

Of course, there are quite a few problems and even clear violations in the trade area itself. However, if one looks truth in the eye—in a normal situation, every salesperson is interested in selling as many goods as possible and in attracting as many buyers as possible. The logic of trade, which has been laid down in its new economic mechanism, lies in this. However, since one must proceed from reality, our duty is to organize trade so that some people do not warm their hands on the shortage while others remain without their share. Here, the main support is the public and glasnost.

Worker control is now operating actively and the criticisms addressed to us in the press have become more justified. However, even here stereotypes predominate at times. Indeed, one should not think that there are no honest people among the millions of trade workers.

The work of a salesclerk, cook and waiter is not easy and simple. One must carry sacks, pile boxes and push wheelbarrows by hand. There are few pre-packaged goods; there are practically no social, cultural and consumer services; and the average monthly wage is one of the lowest in the country's national economic branches.

Administrative measures alone are not enough to eliminate the abuses in trade. New economic approaches toward organizing trade are needed. We are expecting a great deal, for example, from the transfer of trade enterprise collectives to the lease, family and brigade contract. To stop the concealing of goods, we have established the following procedure: The amount of commodity turnover or of one's own public catering products, which is considered when awarding bonuses to workers, is decreased by the amount of hidden goods. For collectives working on a contract (this is half of them), the amount of gross income is reduced by the corresponding amount. The main thing, however, is perhaps the establishment of an atmosphere of intolerance toward any type of distortion in the collectives so that not a single misdemeanor avoids public action and condemnation.

One of our most acute problems is lines. They, of course, are also a consequence of the shortage. However, far from always. Here, we see the solution of the problem to lie in transferring enterprises to self-service operations and using other advanced trade forms. We will basically complete this work before the end of the five-year plan.

Here, a great deal will also depend on the availability of sales areas. In our country, the amount is 176 square meters per thousand inhabitants. This is 85 percent of the requirement. For comparison: It is 300 square meters in Czechoslovakia, 296 square meters in the GDR, and 219 square meters in Hungary. The providing of cities with public catering enterprises is only half of the requirement and even less in a number of republics. We have only received approximately 60 percent of the general freight warehouses and distribution refrigerators that we need.

Of course, it is impossible to build everything immediately. However, it is also simply impossible to stretch out the solution of these problems for years to come. In August of last year, the USSR Council of Ministers adopted a decree in which the task of achieving an effective norm for supplying each union republic, kray,

and oblast with trade areas and public catering enterprises open to the general public during the next three-four years, was listed among the primary ones.

This work is being successfully carried out in Lithuania, Belorussia, a number of RSFSR oblasts, and the Ukraine. Industrial technology for erecting trade enterprises made of light metal designs, whose use reduces the construction time of projects by 1.5-2-fold and reduces labor expenditures almost twofold during construction, is providing a large effect. The series production of mobile dining halls and cafes has begun.

The development of a material base is inseparably connected with its outfitting with modern equipment and facilities. This question is an extremely painful one for the branch. We are now receiving a third less equipment than needed; and for individual positions—only 10-15 percent. Last year, the USSR Council of Ministers adopted a decree entitled "On Producing Trade Technological Equipment During 1989-1995." It provides for increasing the production of equipment from 635 million rubles in 1988 to one billion in 1992; it is planned to reach the requirement level by 1995.

We are faced with doing a great deal to expand public catering. Public catering still does not satisfy the demand being shown. A considerable portion of the population is not satisfied with the services and the quality in the preparation of food.

A serious brake here is the absence of the required economic interest. The production and sale of the majority of the types of prepared foods and culinary and flour items are unprofitable. The losses are approximately 300 million rubles a year. That is why enterprises are compelled to limit the amounts and variety of items. The population's demand is being satisfied by barely 40 percent. Public catering enterprises in schools and vocational training schools annually provide losses of more than 200 million rubles.

The small delivery of industrially produced processed foods forces one to keep more than 150,000 people, who could produce additional prepared products totaling approximately 2.5 billion rubles a year, in the primary processing of vegetables, potatoes, meat and fish. Naturally, this aggravates the work of the branch even more and gives birth to losses and even different abuses.

The way out here is, again, the establishment of conditions to deepen cost accounting relations, the shift of dining halls and cafes to brigade and lease contracts, the more active introduction of industrial methods, and the expansion of enterprise rights to purchase raw materials and commodities and to use earned assets.

At the present time, the public catering enterprises, which service plants, schools, VUZ, etc., are operating in accordance with the third price mark-up category approved from above. This limits the selection of products. It would be more correct for enterprises and establishments to determine themselves the types of services and the price mark-up categories in a contract with public catering. Here, it is possible to follow the experience of other countries that are establishing special territorial funds for local authorities to reduce the price of feeding or to offer, in general, free feeding to school children and pupils in vocational training schools.

Trade and the public catering area are branches which people encounter daily. Moreover, they often judge our restructuring from them. Of course, we would like to trade with everything in abundance. It is only through joint efforts—local authorities, the public and trade workers—that it is possible to introduce order into the mercantile house.

FOOD PROCESSING

Tashkent Conference on Food Production Reported

18270100 Moscow SOTSIALISTICHESKAYA INDUSTRIYA in Russian 20 May 89 p 3

[Article by Ye. Ponarina, SOTSIALISTICHESKAYA INDUSTRIYA special correspondent: "You Will Not Make A Living By Giving Reproaches"]

[Text] Now and then, complicated relationships take shape in the village and city. R. Akbarov, chairman of the Uzbek Kolkhoz imeni K. Marx, complained to the participants in a Tashkent meeting which discussed the tasks involved in supplying the country with food:

"The city has taken away more than half of our land requiring irrigation: 640 hectares! The builders do not want to reconstruct the old blocks; they aim at taking open land. We are not alone in living in poverty because of this: During the last five years, the population of Tashkent Oblast grew by 500,000 people but the production and consumption of fruit and vegetable products decreased...."

In reply, Ye. K. Ligachev, CPSU Central Committee Politburo member and party Central Committee secretary, advised: "If it is this way in the future... begin a strike. Send a telegram to the Central Committee and we will support you. Our land is worth its weight in gold...."

Indeed, the areas of Central Asia requiring irrigation are valuable. How should one increase their return, how should one get away from the monopoly of the cotton plant in the fields, how should one interest the peasant in growing more fruits and vegetables? Representatives of different collectives, ministries and departments, who came from Moscow, Siberia, the Urals, and the Central Asian republics, discussed these questions.

One-fifth of the grapes, one-sixth of the vegetables and 40 percent of the melons being stocked in the country are now being purchased in the Central Asian republics. However, this is not enough. We must annually import 670,000 tons of fruit which we lack.

The task has been posed to increase the production of vegetables by 34 percent and that of fruit, berries and grapes more than twofold by the end of the 13th Five-Year Plan.

We will manage to do this if the structure of investments in the agroindustrial complex is substantially changed and if new sources of material and financial assets are enlisted. This year, the country's enterprises shifted to cost accounting and self-financing and many collectives provided themselves with quite a few assets. They are prepared to invest money in developing the southern rayons and to receive fruits and vegetables from there in a guaranteed exchange. You see, each one of us receives up to 40 kilograms of vegetables and 20 kilograms of fruit a year less than the rational consumption norms on the average.

Next year, kolkhozes and sovkhozes will be permitted to sell 30 percent of their products at contract prices. Money, however, is not everything. It is far more important to receive rolled metal products and pipes or equipment for the processing industry and to build canning shops and storehouses in exchange for the South's gifts. The immediate vested interest of the contracting parties is the reliable guarantee that mutual obligations will be fulfilled. It is only important that the contracts be concluded without many intermediaries, on a particularly voluntary basis and for a long time frame so that—when investing its assets—industry can be confident that it will be able to enjoy the fruits of its efforts.

Ye. K. Ligachev, the leader of the meeting, said in his presentation: "The principles of equality, mutual benefit, equivalent exchange, and commodity-financial relationships must be placed at the basis of these direct ties. Only this approach is responsive to the spirit of restructuring the direction of the economy and the social area based on self-management and self-financing, which is beginning in the republic." This is true. That same Kolkhoz imeni K. Marx has concluded a mutually beneficial contract with Leningrad's Izhorskiy and Kirovskiy plants. This year, the Uzbek field-crop growers will send the city on the Neva 50 tons of apples and onions, 60 tons of tomatoes, 20 tons of grapes, and five tons of peaches to each collective in small batches. They could have provided even more stone-fruits but it did not turn out that way this year—frost killed the gardens, vines and groves. Judging from the words of R. Nishanov, first secretary of the Uzbekistan Communist Party Central Committee, the republic suffered losses of 800 million rubles.

R. Akbarov said: "However, we did not give up. We did what we could, we resowed, we saved what we could manage. We hope to fulfill our obligations. In return, we will receive 360 tons of pipe and 10-12 tons of steel from Leningrad. We need all this to expand our processing capacities and to build storehouses...."

It is necessary to say that not only here, in Tashkent, but all the Central Asian republics need it. As was pointed out during the meeting, processing shops are functioning on only 30 farms in Uzbekistan and on three (!) in Tajikistan. The major amount of fruit and vegetable preserves consumed in Siberia and Central Asia is imported from other regions of the country.

As experience shows, however, mutually beneficial interregional ties can also be successfully formed on a different basis. A kilogram of potatoes now costs approximately three rubles in Tashkent's markets. This is not surprising: They grow poorly here—and, yes, it is a sin to use for potatoes irrigated land which provides up to a 12,000-profit per hectare with vegetables. Considering this, they deliver potatoes to Central Asia from the Urals and Siberia—but how? During the current five-year plan, Bashkiriya and Kurgan, Novosibirsk and Perm oblasts have delivered from 4 to 17 percent of the planned quota. Generally speaking, the RSFSR has provided only half of that promised in the contracts.

Understanding that you will not feed people with complaints to departments, many farms have chosen another way to solve the problem. Siberia has places to plant potatoes—and, yes, there is no one to engage in this. On the other hand, Uzbekistan has people to do this but nowhere to do it. What is to be done? Fergana Oblast, for example, decided to send 150 of its farmers to Krasnoyarsk Kray. They leased 1,200 hectares of land in Khakasin and began to grow potatoes. They are sending half of the harvest grown to Fergana Oblast for sale.

A large problem is the quality of the products rich in vitamins that are delivered from Central Asia. It does not make one happy. As Ye. Sizenko, a USSR minister, reported, Turkmenia sent more than 43 percent of its grapes as non-standard ones and 85.5 percent of the apples and pears as non-standard ones last year. A third of the onions and half of all the tomatoes arrived spoiled in the city. Products from Uzbekistan and Tajikistan arrived in somewhat better condition.

Many think that the reason for this lies in the unwillingness of transport workers to be responsible for the quality of the cargo that they are delivering.

G. Fadeyev, first deputy minister of railways, said: "Understand us. You see, from 40 to 80 percent of the products are sent to the road completely unprepared. If boxes with peaches, which have been harvested at a temperature of 50 degrees in the shade, are strapped in a railroad car without preliminary cooling, what kind of

fruit will get to the consumer? Rotten! Last year, we delivered to Moscow alone 200,000 tons of spoiled products, having used 100,000 railcars to no purpose to do this."

Station warehouse-storage areas with preliminary cooling and sorting and packing shops are needed in Central Asia as nowhere else—but they do not exist.

Fadeyev assured one: "However, as soon as they are built, matters will progress. A guarantee of this is the million rubles which the railroad has allocated to serve as an incentive for the refrigerator railcar brigades who are carefully delivering fruit and vegetable products to the consumer. A brigade receives 30 kopecks for each ton of freight where the standard is no less than 90 percent and fifty kopecks for more than 95 percent. In a month, one can accumulate additional earnings equal to one's pay.

In addition, the railroad workers interwove 80 traffic threads of consists carrying fruits and vegetables through the passenger train schedule this year. They also decided to connect individual sections carrying highly perishable freight to passenger consists when necessary.

Today, rail transport carries 80 percent of the fruit and vegetable products; motor transport—15; and air—only five, although it should logically be more. However, deliveries by air are 24-fold more expensive than rail. The military, which is now agreeing to fulfill civilian orders, is attempting to adopt this "deafining" tariff, as Yu Luzhkov, deputy chairman of the Moscow Gosispolkom, has called it..

References to the fact that we are all on cost accounting and should remember our own departmental profit, will not do at all. It is necessary to search for compromise solutions. Otherwise, it will turn out that—in fighting for a profit—we will completely farm it out to cooperators who mine transport from the land, buy up the products, carry it miles and miles away, and sell it at high prices in Siberia and Magadan. During the meeting, appeals rang out to stop this activity but they did not pick up the idea "to keep but not to allow." On the contrary, they said: Learn competition and enterprise. The task is to provide people a commodity that is needed and not to prevent cooperative members from doing this....

The Muscovites made an interesting proposal to the farms: If you do not have enough storage capacity, lease them in the capital. Store your goods yourselves and sell them at the seasonal price.

In a word, the discussion during the meeting and during the meetings on the farms was an interesting one. The participants—the directors of a number of industrial enterprises, chairmen of their labor collective councils, party and Soviet workers from Moscow and many Ural and Siberian oblasts—studied the different versions of direct ties and looked for mutually beneficial conditions for forming them on a cost accounting basis.

GOODS PRODUCTION, DISTRIBUTION

BSSR Gosplan Chairman on Defense Conversion Progress

18010595 Minsk SOVETSKAYA BELORUSSIYA in Russian 19 Apr 89 p 2

[Article by Novosti Press Agency correspondent V. Khodosovskiy under the rubric "Goods for the People": "'We Are Reforging Swords Into Plowshares': How the Conversion of Defense Enterprises Is Proceeding in the Republic"]

[Text] **The first nuclear missiles have been turned over for scrap. The government has approved a program for converting a number of operating enterprises of the defense industry branches to the production of consumer goods. APN [Novosti Press Agency] correspondent V. Khodosovskiy tells how this is being accomplished in Belorussia.**

The Termoplast plant is almost in the center of Minsk. I cannot say that the journalists did not know the way there, but the enterprise was affiliated with the defense branch of one of the ministries, and there was limited glasnost pertaining to its operation. What about today?

...I visited the plant's shop for consumer goods production. It has produced them for more than 10 years now, an average of around 25 different items annually. And all that time the production volume has been increasing. Today, 1 ruble and 73 kopecks worth of consumer goods is produced per ruble of wage fund at Termoplast. Compare this with 80 kopecks per ruble at nonspecialized civilian enterprises in Belorussia.

"All enterprises of the defense sector in the region have produced consumer goods since the mid-70s," said Vyacheslav Frantsevich Kebich, chairman of the republic Gosplan. "The Coordinating Council for the Production of Consumer Goods of the Belorussian SSR and the Baltic Republics was established at that time and is still functioning (Moldavia joined it later). Its authority extended also to defense enterprises. Household equipment, television and radioelectronic equipment, cameras and electronic watches account for the bulk of civilian production at the region's defense plants. They produced a total of more than 1.7 billion rubbles worth of consumer goods in 1988. Their average annual growth rate has amounted to 10.3 percent during the current 5-year period."

...It is not all so simple with the conversion from defense to civilian products, however. The assembly lines were obviously standing idle in the Termoplast shops. The production engineer who accompanied me explained that there were not enough assembly electric motors.

"Then even the defense branches, which were considered outside the sphere of the usual economic problems, suffer the same lack of coordination of reciprocal ties and the same shortage of materials, capacities and assembly parts?" I asked Kebich.

"Naturally, the defense branches do not operate in a vacuum. And although in this specific case the breakdown in the production of washing machines is the fault of a Union ministry not connected to defense, the region's military enterprises also have their problems. Certain leaders regard consumer goods as something secondary, for example."

"Are there realistic prospects for eliminating them"?

"First of all, it is important to stress the fact that the cover of secrecy does not isolate these enterprises from the restructuring. The conversion decision adopted by the government will not only help to enrich our shelves with new goods, but will also change the attitude that assignments for consumer goods production are an inconvenient makeweight. The conversion of consumer goods sections to economic accountability and the introduction of more flexible methods of organizing production will be accelerated, including those involving cooperatives and the establishment of small sections with flexibility for altering the assortment.

"The higher technological level of equipment of the defense production operations and the skilled cadres, as well as the production discipline, provides a basis for hoping that real progress will be achieved. Particularly since specific programs have been outlined."

"What will be added to the selection of consumer goods by the conversion underway in the region"?

"First of all, we should anticipate movement in the production of goods incorporating computers and electronic equipment. The schools are already familiar with our Korvet sets of equipment for computer rooms. They are in extremely short supply, however, and their production will be increased. In addition, the development of a new set, the Nemiga, has been completed. It will go into regular production this year. The development of modern personal computers compatible with the Unified System EVM [electronic computer] programs and components is underway and will go into production within the next few years. Cooperating with civilian enterprises, the defense production facilities will be able to increase the output of home refrigerators. It is planned to set up the production of small diesel engines for mini-tractors. Preparations are underway for producing laser sound pickups for digital laser record players, and in the future, in cooperation with other enterprises, the record players themselves.

"Enterprises of the former USSR Ministry of the Light and Food Industry, which was unable to produce quality equipment for processing products of the fields and farms, were recently turned over to defense branches."

"The new 'sponsored' units are not a gift to the defense industry workers, of course. With the help of their developed scientific and planning and design base, however, the situation can be improved. In the Belorussian region, for example, they have already begun developing fundamentally new types of comprehensive production assemblies based on the latest technological achievements. The plans for the defense enterprises contain 68 types of equipment for the initial processing of livestock and poultry, 41 types of production equipment for the secondary processing of meat, and other equipment.

"Everything would indicate that the government's decision is not diverging from the reality."

"I believe that the consumers will be able to see this for themselves soon."

Civilian Goods Produced by Military Enterprise

18010654a Moscow KRASNAYA ZVEZDA in Russian 1 May 89 First Edition p 1

[Article by Sr Lt O. Sgibnev, Volga Military District, under the rubric "With the Same Concerns as the People": "The Plant's New Specialty"]

[Text] **Conversion. This word has now come to designate a program for the respecialization of enterprises in the defense industry for the production of consumer goods. Civilian products will comprise up to 60% of the total output of the defense complex by 1995. It is planned to produce 27 billion rubles worth of civilian products at the nation's military enterprises this year, which is 7.5% of the total output of consumer goods.**

The military enterprise directed by Col V. Belyayev is among those which have already begun producing consumer goods. Its new products include sets of kitchen furniture.

"Naturally, we had to completely restructure production in order to switch to the output of kitchen furniture," Col V. Belyayev said.

The shop began turning out products literally 2 weeks after the retooling. Sixty sets of kitchen furniture have already been produced. Sales volumes for these products will increase several times over by the end of the year, to 350,000 rubles worth. Everything is not going as smoothly as we would like, however. There are many problems with the retooling of the production process.

The difficulties do not frighten the plant workers, however. They will ultimately be overcome. The new operation promises to benefit both the nation and the enterprise.

"All of the profits from consumer goods production goes to meet our needs," says Vladimir Vasilyevich Belyayev. "We are building a 96-unit apartment building for the plant workers and have allocated additional funds for modernizing the enterprise."

A trade procurement base has already expressed an interest in the military enterprise's new products. An agreement has been concluded for 2,000 sets. The city residents are counting on 6,000 sets. The plant still does not have the capacity to fill all of these orders, of course.

MVD Official Notes Shadow Economy Abuses in Light Industry

18270101 Moscow PRAVITELSTVENNYY VESTNIK in Russian
No 8, Apr 89 (signed to press 13 Apr 89) pp 11-12

[Article by V. Bulgakov, deputy chief of the USSR Ministry of Internal Affairs GUBKhSS [Main Administration for Combating the Embezzlement of Socialist Property and Profiteering]: "The Shadow Economy"]

[Text] Rogovaya, chairman of the Ozerskiy Rayon Consumer Society in Moscow Oblast, and Motorovoy, an economist, decided to make a profit from those who handed products over to them. The bribe from the victims, who were selected by them, was designated "in round numbers"—10 percent of the cost of the goods brought. If you do not want to pay—away with you with your property; follow your nose. Perelygin, the director of the Taganrogskiy City Cooperative Trade System in Rostov Oblast, followed a different path: With his fellow worker—a trade official in charge of procurement, he bought up the fruits and vegetables on the kolkhozes and sovkhozes and drew up a formal acceptance using false data for higher prices. A total of 50,000 rubles, which were stolen in this manner, were in his pocket....

It is obvious that the reader has already encountered such examples more than once in newspapers and magazines. That is why I will only say that people annually overpay a minimum of five billion rubles for goods purchased in the market than if they had acquired them in the state trade network—a minimum because we still do not have accurate data on the amount of unearned income and it is not easy to calculate it.

This is only one—and far from the major part—of the damages which the shadow circulation is inflicting on our economy. According to the estimates of some specialists, the total amount of money, which passes through its channels, reaches 100-150 billion rubles! Much is being written in the press now about its forms, means and methods. This is happening not only and not so much because the mass information media are confirming the policy of glasnost, removing the covers from subjects that were closed even recently. The public's attention is also being riveted on the abnormal phenomenon in our life because it is a foreign body in a socialist economy, it prevents its healthy development, and it—in particular—complicates its financial condition, increasing the uncontrolled amount of money in our marketplace.

Thus, the press and the public are not sounding the alarm in vain over the increase in the shadow economy and the economic crimes which it is giving birth to in very unexpected areas. In September 1988, the capital's BKhSS [struggle against the embezzlement of socialist property and profiteering] and a production control group at the Moscow city telephone station examined the removal of cash in coin-box phones. The results are in: the planned income, calculated on 58,000 coin-box phones, was exceeded by 37,500 rubles after the the collection of money from only 47,000 phones was monitored. Not one of us had suspected that such amounts of monetary gain was escaping from the state budget. The "leak" was stopped and the income from using the coin-box telephone network increased by 39,000 rubles during the year.

The grossest violations of bookkeeping and zootechnical accounting and upward distortions and misrepresentations of accounts are widely practiced in our agricultural enterprises—the kolkhozes and sovkhozes. This is creating a favorable soil for swindlers. Investigating agencies have encountered the following case: A certain group in Saratov Oblast had accommodated itself to not weighing cattle when sending it to the Rtishchevskiy Meat Combine. The surplus, which appeared as a result of the deceit, brought more than 70,000 rubles to the plunderers.

The state trading system has become another refuge for illegal deals. Here, twofold plus more embezzlements per each 10,000 workers are committed than in the national economy on average. During the last two and a half years, 27,000 cases of embezzlement and more than 1,500 cases of bribery have been exposed in the state trading system. Annually, more than 5,000 shop-assistants and public catering workers have criminal proceedings instituted against them for theft alone. Large concealed thefts have been stopped, for example, in the trade organizations of the Ukraine; Turkmenia; Kemerovo, Kuybyshev and Rostov oblasts; Moscow; Leningrad; and other cities.

Nevertheless, the crime wave is not abating. During 1988, 26 percent more cases of theft were revealed in the USSR Ministry of Trade system than during the previous year—8,700 as opposed to 6,900.

An especially alarming situation is taking shape in public catering establishments which account for one third of the crimes committed in the state trading system.

Here are several concrete examples. In Belorussia, every other inspected enterprise in the Lidskiy Dining Hall and Restaurant Trust had made upward distortions in the sales accounts of its products. In Volgograd, scarce goods

were sold at prices, which were set too high, and dishes were adulterated. In this manner, more than 90,000 rubles migrated from the purses of the consumers to the hands of the thieves. Shatalova, the director of the Kurgan Oblast public catering administration base, contrived to steal more than 84 tons of sugar and approximately 100,000 packages of Kosmos cigarettes totaling 314,000 rubles. She managed to sell all this through stores in the Georgian SSR.

As before, abuses are also occurring in the sale of alcoholic beverages. During 1988, administrative proceedings were instituted against more than 24,500 trade workers and approximately 4,000 instances of concealing wine and vodka items and their sale from auxiliary premises as well as other violations were detected.

The creation of an artificial shortage by this means has become one of the common methods for dishonest people to extract unearned income. This leads to large batches of industrial-demand commodities being sold to second-hand dealers directly from bases, warehouses and the auxiliary premises of stores and their getting to consumers only through speculators at inflated prices.

Thus, during the pre-New Year inspections that were conducted throughout the country by internal affairs and worker control agencies, many gross violations of trade rules were established in one-seventh of the 60,000 trade organizations which they visited; the establishment of secret stocks of goods and their sale under the counter were striking. During 10 days, 16 million rubles worth of scarce products were found and placed on store shelves.

I think that it is now difficult to meet a person who does not know about speculation and who has not encountered it in some form or other. During the last 18 years, the number of criminally punishable speculative deals grew 2.4-fold; and its distressing manifestations—fivefold. Their growth has not stopped this year.

On the Moscow-Transcaucasus line, tons of butter and candy, thousands of bottles of imported beer and packages of tea, and other goods bought up in the capital's stores at approximately 400,000 rubles were taken away from second-hand dealers last year. Buyers send 30,000 containers with furniture, a considerable part of which is obtained using a bribe or some other illegal means, to other rayons in the country annually. By the way, the deformations in planning, where—for example—the Mosmebeltorg [Moscow Furniture Trade Agency] is allocated half of the total imported furniture assets for the Russian Federation, contributes to this. It is clear that such a distribution supports the speculation fever.

As is known, the public has welcomed the development of individual labor activity and the cooperative sector of the economy. Even here, however, everything is not well. The fact is that a certain portion of the cooperative system's members and individuals have chosen the road of searching for and using channels and loopholes for rapid profits: products, industrial goods and building materials are bought up in large batches and sold at inflated prices. For example, cooperatives in Ternopol Oblast purchased 12 tons of sugar and other products worth 340,000 rubles last year in stores. One of the Leningrad cooperatives systematically purchased inexpensive soap and made a souvenir out of it. Subsequently it offered the "lavish" item to its purchasers at 70 kopecks and 1.40 rubles through Leningrad's sales points.

Some cooperative directors are using illegal ways to "procure" material and technical resources and raw materials, many of which are on a strictly funded products lists as, in particular, all types and brands of polyethylene. Last year, a great number of large thefts of this raw material for its resale to cooperatives was discovered in industrial enterprises. The theft of approximately 30 tons of cable plastic material, which was illegally released by the Novosibirskiy Chemical Plant and subsequently fictitiously written off for production but actually sold to cooperatives, is being investigated. Similar cases have occurred in the Irkutskiy Cable Plant, Vladimirskiy Chemical Plant, Sochinskaya Footwear Factory, and others.

Incidentally, the recent government decision, which provides an opportunity to cooperatives to obtain raw material for funds, will undoubtedly help to narrow this channel of abuses.

Of course, the cited data far from completely paints a picture of the shadow economy. However, it permits one to imagine all the main avenues and the action mechanism in this criminal area and its braking role in the task of implementing the plans for renewing the country's national economy. It is quite natural that, when the Soviet people find out about the billions of assets melting away from the state's treasury, they will ask: Where are our agencies, who have been called upon to combat economic crimes, plunderers, bribe-takers, and speculators, looking? I can say with complete responsibility that internal affairs agencies and their BKhSS staff have recently noticeably increased their assault on the most dangerous and organized displays of crime. Groups of plunderers and bribe-takers have been unmasked in the Tajik SSR Gossnab system, in domestic services and local industry enterprises of the Uzbek and Kazak republics, and in a number of Russian Federation oblasts as have large speculators with international ties.

Preventive work is also providing certain fruits: Thanks to it, losses of unaccounted for material valuables totaling 112 million rubles were prevented last year. This is almost twofold more than we managed to save in the previous year.

Nevertheless, as is completely evident, we are not managing to deliver the population from the consequences of economic crimes and to defend our economy against their destabilizing influence. In my view, it is difficult to

cope with this calamity using only law protection agencies and primarily administrative measures. You see, speaking frankly, we are struggling against the consequences and not against the causes of this criminal activity. The causes are mainly rooted in economic factors. Essentially, even the most fleeting glance at economic activity convinces one of this. Investments in the economy's consumer sector have been significantly less than those in group "A" for decades. The outpacing growth of the population's monetary income when compared to the increase in the production of goods and the providing of services has become firmly established. A significant portion of enterprises have displayed a tendency to curtail the production of inexpensive items and to increase prices.

There exist a multitude of other factors which in their totality create an unbalanced state and an imbalance in the consumer market. Evidently, one can tear out the roots of the shadow economy if one does not rely only on administrative methods and such, of course, very important measures as strengthening the law enforcement system but combines them with a thorough transformation in economic attitudes—restructuring is creating the potential capabilities for this.

FUELS

Lignite Extraction, Processing To Increase

18220073 Kiev KOMMUNIST UKRAINY in Russian No 1, Jan 89 pp 50-54

[Article by V.I. Bachurin, mining engineer (Kiev); I.L. Gumenik, candidate of technical sciences (Dnepropetrovsk); V.V. Makhinya, general director of Aleksandriyaugol Association (Kirovograd Oblast), and I.I. Yarchuk, doctor of agricultural sciences (Dnepropetrovsk), under the "Economics" rubric: "Lignite: A Fuel and a Raw Material"]

[Text] Our present efforts in the areas of resource conservation and full utilization of raw materials, fuel and materials are extremely important.

Consider the following economic calculation. If the by-products of lignite surface mining were considered to be a raw material for integrated processing rather than a hinderance to lignite extraction, then these by-products could be used to produce building materials, mineral and organic additives for agriculture and many other urgent necessities. The profit from these products would more than cover all the costs of overburden removal.

An analysis of scientific research in this field and of foreign practice shows that we are not realizing the full commercial potential of overburden materials. Our technologies for mining and processing lignite and its by-products are obsolete, and are clearly not up to modern standards.

The new USSR Law on State Enterprises (Associations) provides us with real opportunities not only to mine enough lignite to meet the demand for briquettes, but also to extract lignite by-products and utilize the valuable minerals and chemical stocks in lignite-mine overburden.

The Dnepr Lignite Basin is located in the central Ukraine. It is a broad band stretching over Zhitomir, Kiev, Cherkassy, Kirovograd, Zaporozhye and Dnepropetrovsk Oblasts. The total lignite reserves here are over three billion tons.

The lignite produced in the Dnepr Basin is intermediate between peat and true lignite.

The basic materials comprising this lignite are deciduous trees (70-90 percent), conifers (5-20 percent), ferns and grasses, with significant inclusions of mineral impurities and partially decomposed plant matter. Because these seams are very thick and the overburden relatively thin, they are suitable for underground or surface mining.

Although the art of mining this lignite has always been complicated and difficult, it is twice as difficult to process it. Therefore, it is still used mainly as a fuel.

The Basic Scientific-Research Laboratory of the Dnepropetrovsk Mining Institute has established that the waste dumps of surface mines represent a source of valuable minerals and chemical raw materials. The approximate predicted reserves for existing surface mines in Kirovograd Oblast alone (there are also surface mines in Zhitomir and Cherkassy Oblasts) are enormous: hundreds of millions of cubic meters of valuable sands, sandy loams and carbonaceous clays.

The surface mines of Aleksandriyaugol Association, for example, produce 60-65 million cubic meters of overburden per year. A significant amount of this consists of traditional stocks for building materials. However, these by-products continue to be hauled to dumps and mixed, and thus are irretrievably lost as commercial minerals.

Meanwhile, laboratory and industrial tests established that pale-yellow loams are suitable for brick production, and with additions of high-plasticity material, are suitable for ceramic plates, tiles and drain pipes.

The sands of the Kiev Formation can be used as fillers for concretes and construction grouts, and the carbonaceous clays can be used for the production of ceramic brick. Another very promising use of these sands is for the manufacture of foam glass, glass blocks, fiberglass, insulators, drain pipes and plate glass.

However, the degree of integrated utilization of the basin's deposits remains low, while a measly one percent of mine tailings is used to produce building materials. What is the problem here? Is it that mining technologies must be changed or that labor productivity would be lower as a result? No. Analysis of mining systems shows that each type of overburden material can be separately mined using practically all types of existing equipment. Unfortunately, this is not being done.

Coal enterprises have been operating in the region for decades. In that entire time, not a single building-material enterprise has been built. The surface mines have begun to acquire other ministries' plants which produce minerals similar to the overburden being removed by the coal enterprises. The development of these mineral sources requires considerable material and labor resources.

The Aleksandriya Brick Plant Administration requires about 130,000 cubic meters of raw material per year, which could be obtained from the overburden of the Verbolozovskiy Surface Mine. Commercial tests have shown that the brick made of this material has better strength properties and better commercial appearance than bricks made from the plant's own mine, while the cost of obtaining one cubic meter of clay from overburden is 46 kopeks lower. The Aleksandriya Reinforced Concrete Plant is in an even worse position. It obtains sand dredged from the Dnepr: the sand is barged to Kremenchug or Cherkassy, transferred to railcars and only then delivered to the plant.

It can be seen from the above that the use of overburden byproducts from the surface mines of Aleksandriyaugol Association would provide a good-quality, inexpensive raw material for the region's construction industry, reduce expenditures for geological exploration, eliminate the need to construct and operate special surface mines, reduce the land area disturbed by these mining operations and have a significant economic effect.

The first experiment is already underway. The Verbolozovskiy Surface Mine of Aleksandriyaugol Association (USSR Ministry of the Coal Industry) and the Aleksandriya Brick Plant Administration (UkSSR Ministry of Building Materials) have signed an agreement for the supply of pale-yellow loams. Two or three other such examples can be cited. Instead of discarding the overburden, the mines supply construction-industry enterprises with a raw material at a price of 0.3-1.2 rubles per cubic meter. The construction-industry enterprises save considerable amounts through reduced product costs. The advantage is mutual. But this is only the start. Today, one of the most urgent tasks is to satisfy the raw-material demands of construction-industry enterprises not only in the Aleksandriya region, but also in all of Kirovograd Oblast and in other oblasts as well. It is especially important to accelerate development and to implement such methods as selective mining and separate storage of good-quality overburden materials. Such methods would make it possible to preserve the technological and industrial properties of these materials, and would make secondary mining efficient. This would make it possible to establish an economic and reliable raw-material base for the building-materials industry and to reduce the amount of land occupied by mining operations.

Here are some other examples of efficient mineral use.

In the village of Kmitov (Korostyshevskiy Rayon, Zhitomir Oblast), the Zavet Ilicha Kolkhoz (V.A. Solovey, chairman) applied 7000 and 10,000 tons of so-called complex humic fertilizers to its fields in 1986 and 1987, respectively. These fertilizers are lignites treated with ammonia water and small amounts of mineral fertilizers. They have been doing this for the last 15 years. While this farm has far from the best soils in the region and has a relatively small livestock operation (producing less manure for the fields), the farm is a consistent leader in the rayon in the production of potatoes, beets, grains and other crops. In the neighboring Andrushevskiy Rayon of the same oblast, at the imeni T.G. Shevchenko Kolkhoz, the farm's experienced chairman, N.S. Timoshchuk, has initiated the practice of applying high-ash lignite to cropland. As a result, plants grow better, have a deep green color and produce higher yields and better-quality fruits. From a scientific point of view, the "secrets" of using lignite in agriculture are very simple to explain. The production of agricultural products removes plant nutrients from the soil, which in turn reduces the humus content and soil fertility.

It is known that both mineral and organic fertilizers must be used in order to restore the soil nutrient balance. Farms do not have sufficient supplies of these fertilizers. Consequently, other sources of humus must be found. Processed lignites and carbonaceous clays can provide additional plant nutrients.

Over 25 years ago, the Basic Research Laboratory on Humic Fertilizers of the Dnepropetrovsk Agricultural Institute developed a technology for obtaining humoammophos and sodium humate from lignite. With special processing, the humic acids in the lignites are converted into a mobile form which can restore the humus balance in soil. The laboratory also obtained a livestock feed additive with no inert ingredients. Used in small doses, it produces significant live-weight increases in cattle and poultry. The use of humate in medicine is also very promising. One modification of this substance is now used in cornea transplants and treatments.

Seed pretreatment with a 2- to 3-percent humate solution, along with the necessary semimoist pesticide treatment, can increase winter-wheat and grain-corn yields by 2 to 3 centners per hectare, oat and barely yields by 1.5-2.5 centners and sunflower yields by 1.6-2.5 centners.

Tests showed that the application of humates with urea as top-dressing for agricultural crops results in better urea uptake through leaves. This increases yields by 1.5-2 centners per hectare. Agricultural workers are very familiar with the value of this addition, which increases the gluten content in grains.

The Krasnodar Agricultural Scientific-Research Institute imeni P.P. Lukyanenko and the local branch of the Scientific Research Institute of Civil Aviation have developed a method of airborne and ground application of sodium humate and sodium humate mixed with urea on winter wheat fields. This method was tested in 1987 on a 600-hectare plot, yielding vigorous, high-quality wheat. This method has passed government tests and has been recommended for implementation.

It has been proven that the use of sodium humate is especially promising for intensive agriculture. It is inexpensive, is used in small doses and entails no additional application costs since it can be combined with other required applications. The application of one centner of sodium humate per hectare before sowing not only increases yields, but also makes plants more resistant to pesticide uptake. Ukrainian farms used 70 tons of humate in 1984 and 830 tons in 1986. Last year, sodium humate was used on over 200,000 hectares, producing a net return of 5 million rubles.

We note that the development work for humate was completed back in 1960. Twenty years passed before it was proven to be a very effective product. How many more years will be needed before humate is used on a large scale?

The experience of farms using lignite-derived mineral fertilizers (humates and humoammophos) is not being studied and not being propagated. USSR Gosagroprom [State Agroindustrial Committee] does not want to take the lead in producing and applying these products. UkSSR Gosagroprom takes the same position. This goes totally against the decree of the CPSU Central Committee and the USSR Council of Ministers on the improvement of scientific support for the development of the agroindustrial complex.

True, USSR Gosagroprom has recently shown an interest in humates. In some regions of the country, humate trials have begun. The only trouble is that the humates are from Italy. We're paying hard currency for them! How ridiculous can you get? After all, our own humates were tested long ago. They are better than foreign ones, have produced good results, are backed by an enormous raw-material base and have government approval. Who will begin producing these mineral fertilizers and how soon will they do it? Will it be the USSR Ministry of the Coal Industry, the USSR Ministry of Mineral Fertilizer Production or the USSR Ministry of the Chemical Industry? In our view, the coal industry should do it. Here's why. The coal industry has the experience in processing lignite and obtaining such products as lignite briquettes, humates and montan wax.

Due to planning problems, raw-lignite output is not coordinated with briquette production. As a result, Aleksandriyaugol Association annually accumulates over 1.5 million tons of strongly oxidized lignites. Although no longer suitable for briquetting, these are an excellent raw material for mineral fertilizers. The more oxidized lignite becomes, the greater the yield of humic acids, and the better it is as a raw material for humates. In addition, the technology for making these compounds is very simple. The association's existing briquetting plants could set up production with small additional capital expenditures. The fertilizer can be made from lignites as well as carbonaceous clays, which are now being hauled to dumps.

Ukrainian lignites also can be processed to produce montan wax, which is used in many industrial sectors. In machine building, it is used for making precision-casting patterns, automotive pastes (the pastes produced by GDR are very well known) and high-quality lubricants. In the leather and footwear industry, it is used in leather-finishing cremes and compounds and in the production of leather substitutes. It is used in electrical cable compounds, and also in the production of copier, coated, colored and glossy papers. The household-chemical, machine-building, textile, paint, pharmaceutical and perfume industries have difficulty obtaining sufficient montan wax. It is a scarce product in this country. It is produced in FRG and the USA. GDR produces about 80 percent of the world's montan wax. True, we have our own experience in this matter, but for years we have been unable to increase our production volume of this valuable product. There are two basic reasons for this: one, most attention is given to the production plans for the supply of briquetting operations or local TETs's; two, there is a lack of financial incentive for workers in underground and surface mines and at the association. In addition, the USSR Ministry of the Petroleum Industry has no vital interest in increasing the output of this product. At the same time, power plants burn lignite which still contains the montan wax. In 1986-1987 alone, 3.5 million tons of lignites containing montan wax were consumed in furnaces. This represents a loss of hundreds of thousands of tons of montan wax. Thus, scientific developments, as well as domestic and foreign experience, show that lignite by-products should be utilized.

Today, the production enterprise (association) has been assigned the main role in the development of the country's potential. In order to create and multiply the public wealth, satisfy industrial and consumer demands for a wide range of high-quality products and on that basis improve the public welfare, the interests of various enterprises in the region must be united on an economic basis.

Even with our best efforts, there cannot be a complete restructuring of existing business methods without a fundamental change in our attitudes toward the wasteful use of minerals. We are convinced that the full potential of the Dnepr Lignite Basin cannot be realized without the joint efforts of republic and national planning agencies, USSR and UkSSR Gosagroprom, the ministries, scientific-research and project institutes, the UkSSR Academy of Sciences, a wide range of specialists and the public. Scientists and producers can help overcome the stagnation in this area. Finally, we need to set an example and show other sectors how to utilize mineral by-products. We are ready to take on this challenge.

ELECTRIC POWER GENERATION

Decision to Halt Chigirinskaya AES Construction Adopted

18220152

[Editorial Report] Kiev PRAVDA UKRAINY in Russian for 24 May 1989 carries on page 3 a 500-word interview with B.V. Kachura, secretary of the Ukrainain Communist Party Central Committee. The interview is in response to the concerns of the local population regarding construction of the Chigirinskaya AES. Work on the station had been halted pending the decision of the USSR Council of Ministers. Kachura reports that "on 19 May the USSR Council of Ministers adopted a proposal to exclude the Chigirinskaya station from plans for the development of nuclear power." He adds that the plant will be reprofiled as a facility with "ecologically clean production."

Kiev RABOCHAYA GAZETA in Russian on 24 May page 1 carries a brief report about the USSR Council of Ministers decision regarding the Chigirinskaya AES.

Ignalina Nuclear Power Plant Safety Questioned

51000005 Vilnius SOVETSKAYA LITVA in Russian 22 Mar 89 p 3

[Article by V. Kaminskas, doctor of technical sciences and professor, under the "Power Generation: Problems and Solutions" rubric: "Will Ignalina AES Be Safe?"]

[Text] The Lithuanian people have shown their distrust in the Ignalina AES. Above all, it was expressed in the decisive "No" to the construction of a third power-generating unit. In turn, the nuclear power plant's workers and designers blame Lithuanian authors for their initial lack of objectivity and incompetence, noting several imprecisions encountered in publications and speeches.

Although I was not a specialist on using atomic energy, I cannot rightfully be considered a "dilettante" either since I am a representative of cybernetics—the science of the general laws of modeling and managing complex systems. In the past few years I have come to be acquainted with the processes that take place in nuclear power reactors, the principles and systems of managing them, and methods of ensuring the operating safety of reactors. I would like to express some of my ideas with regard to these topics.

AES belong to the class of very hazardous industrial facilities. In view of this, their reactors should possess the property of "self-regulation." What is this? In lay terms, the heat liberated by a reactor may not increase rapidly and should always be stabilized independently of any errors on the part of service personnel or a failure of the automation system. The property of "self-regulation" specifies the so-called effects of reactivity, the sum effect of which should, through the inner feedback circuits, be negative. This means that any increase in a reactor's power should, through the inner feedback circuits, be converted into negative reactivity. This reactivity "opposes" any further increase in power until the process is stabilized.

In uranium-graphite heterogeneous single-loop boiling water [RBMK] reactors, two of which are already operating at the Ignalina AES as we know, one of these reactivity effects (the so-called steam reactivity effect) has a positive impact. In this case, the formation of a large quantity of steam in the reactor's core results in an increase in its thermal capacity, which in turn facilitates additional steam formation, i.e., the reactor's capacity continues to increase. Under normal operating conditions, however, the steam effect is not predominant. The sum result of these reactivity effects therefore remains negative, and the reactor maintains its property of "self-regulation."

Nevertheless, can a situation not be created in which a positive steam reactivity effect becomes predominant? This is exactly what happened at the No. 4 unit of the Chernobyl AES where a catastrophe occurred. The main reason for this accident was that the reactor was brought into a hazardous and uncontrollable mode in which the positive steam reactivity effect became predominant. Because of this the reactor lost its trait of "self-regulation" and stability, and the operator and automation equipment were no longer able to manage it.

In view of this, it is above all necessary to answer the fundamental question of whether the respective departments that created and are operating RBMK-type reactors are taking sufficient measures so as to prevent the Chernobyl situation from being repeated? One can hardly provide an unequivocal answer. I think, however, that attention must be paid to the following forces.

The very contradictory information that exists makes it very difficult to draw any conclusion regarding the degree to which it has really been possible to reduce the positive steam reactivity effect. Although designers insist that the positive steam reactivity effect can no longer become predominant, only comprehensive experimental research on the dynamics of reactors in different operating modes can answer this question fully. If such research is already being conducted, the results must be presented for open discussion.

Speaking of automatic control, monitoring, and protection systems, it must be noted that they were created in times when the opinion that RBMK-type reactors could not lose their property of "self-regulation" predominated. In view of this, the systems use very simple control and monitoring principles, and they do not afford the possibility of making quick changes in control laws to allow for a reactor's ongoing dynamic properties. For this reason, in rapidly developing situations, an operator is subjected to a great nervous and emotional load, and his options are limited....

Based on the aforementioned, I cannot agree that the problems of the safe operation of RBMK-type reactors will be solved by taking such additional measures as increasing the "reactivity margin" and the speed at which the rods of the protection system are introduced. Like other AES with RBMK reactors, the Ignalina AES cannot be operated safely without a modern and reliable process control and monitoring system and a system for online diagnosis of the technical condition of its equipment. Also needed are modern information support systems for operators that would help in making correct decisions in complicated situations and thereby make it possible to prevent catastrophic consequences.

It should be noted that an automatic control system based on modern computers was already supposed to be functioning at the Ignalina AES when the first power-generating unit was started up. The system is still not completely finished, however. In essence it is only performing an information-gathering function. The matters of improving and developing it have been left to the departments that created the Ignalina AES. Most of the effort in the country is currently being directed toward

creating modern automatic control and information support systems for operators at those AES at which water-moderated, water-cooled [VVER]-type reactors are operated. Toward this end, a state scientific-engineering program has been created, specialists from CEMA member countries have been involved in scientific research and design works, and developments are being based on the latest computer technology.

The strange position that domestic departments have taken with regard to AES with VVER reactors is, without a doubt, due to the fact that, in accordance with one of the scenarios of the USSR Power Generation Program, beginning in 1995, power-generating units with RBMK reactors are slated to be taken out of service until this type of AES is completely shut down in 2005. Is not it therefore inadvisable to invest resources and intelligence in creating comparatively expensive systems that are intended to guarantee the safety of unpromising reactors?

In view of this, the republic's legislature should demand that the union departments provide the No. 1 and No. 2 power-generating units of the Ignalina AES with modern online diagnostic, automatic control, and operator information support systems right away. Since designers insist that the Ignalina AES has been provided with the best systems in the Soviet Union, we must look for possible ways of acquiring the engineering and technology for control and diagnostic systems that have been developed by foreign firms.

Obviously, the legislature of the Lithuanian SSR should create its own expert commission that would include all of the republic's scholars and specialists who are competent to assess the engineering decisions and means for implementing them that have been proposed by the designers of the Ignalina AES. They should be equal partners in the scientific discussions. Only then can there be hope of finding the best and most well founded alternative. This is especially important when creating neutral commissions in which experts from foreign countries participate. The main tasks of a republic expert institution should be to constantly analyze and monitor the operation of the Ignalina AES and matters related to improving its systems and to prepare scientifically well founded proposals for the republic's legislature.

What alternative is there to the No. 3 power-generating unit at the Ignalina AES? Power engineers predict that by 1995 and perhaps earlier we will feel a shortage of electric power. I think, however, that today one can hardly assess the existing forecasts unequivocally. Indeed, under conditions of the republic's economic sovereignty, we will be able to change the existing structure of industry, rejecting production requiring a great deal of power and raw materials and switching to science-intensive production that would be competitive on the world market. If no suitable alternative to nuclear power generation is found by the time we experience a shortage of electric power, we will have to think about low-power (100,000 to 150,000 kW), compact (so-called modular) reactors with passive protection. The first publications dealing with these reactors have already appeared in the world press. All currently operating reactors that are cooled by water or gas should be furnished with external safety systems. When they fail, however, a more or less hazardous accident may occur. In the aforementioned modular reactors, self-protective properties are embedded in the reactor's very physical structure.

Snechkus AES Construction Elicits Protests, Problems

18220072A Moscow KOMSOMOLSKAYA PRAVDA in Russian 14 Jan 89 p 3

[Article by I. Tamulis and Z. Vayshvila: "Core of the Problem: In Snechkus, Which Has About 35,000 Inhabitants, Almost Everything Revolves Around the Nuclear Power Plant. Is This a Good Thing?"]

[Text] People here are very closely tied to the power plant. Although about 3000 people work at the power plant itself, an absolute majority of the jobs are directly related to the plant or various support functions.

There is no other large enterprise in Snechkus. There are only a few other jobs in the service industry. There is no point in distinguishing between the Western Construction Administration and the AES; they have acted as one, dictating their will to Snechkus. We saw this when we attempted to come to an agreement with the local authorities during our preparations for the political action "Ring of Life." Although power belongs to the ispolkom chairman, the Western Construction Administration and the power plant had the last word. If you've got the money, you call the shots. The administration and the power plant are different fingers on the hand of the all-union ministries, which are giving the orders here. In the future, power will be even more centralized. It is now known that the Western Construction Administration is being relocated to Rakov in Belorussia. The only employer left in Snechkus will be the AES, or more accurately, the all-union ministry.

From what has been said, you can understand why the people of Snechkus have been so hostile to any political action by other Lithuanians against the Ignalina AES, or more accurately, against the situation there. The people of Snechkus have become hostages to the power plant. As long as the plant is operating, people will have work and apartments, which have now become homes. People have really settled in here. This is a fact of life, and we must deal with it. The Western Construction Administration and the "nomads" are abandoning the town. Those who remain will be people who have decided to become citizens of the Lithuanian SSR. By the way, most Snechkusians are good-natured, and view the proclamation of Lithuanian as the state language much more soberly than representatives of several nationalist groups around Vilnius. If the power plant is shut down for some

reason, these people will lose nearly everything. In that position, it would be difficult to be impartial about those other political actions. Unfortunately, Snechkusians have frequently considered these actions to be directed against them personally. But we can and must understand these people: they have no other way out yet.

It is difficult to understand the other people involved; namely, the people responsible for designing and building this entire complex. After all, during the early stages of the project, it was clear that there would be the problem of finding work for spouses, as well as the problem of establishing a normal social infrastructure in the city. The conclusion is obvious. It is very advantageous for someone to have a position in Snechkus. Whatever the quality and reliability of the power plant and whatever happens here, people will still defend the plant as their provider. They will defend it themselves, and won't be begging for anything. Furthermore, under these conditions, it is very easy to control people. Nobody wants to lose a job in Snechkus. There was already a shortage of over 1500 jobs. A person who is not on good terms with management would have an especially difficult time finding work, because one agency controls everything. All this prompts more lenient attitudes toward workplace safety, worker health and worker needs (remember the open dump of low-level radioactive materials on the AES site). People who are no longer needed are forgotten quickly. After construction of the third generating unit was halted, the Ministry of Atomic Power reduced financing for social and cultural programs and public facilities to one third. The city still does not have a house of culture, a railroad or bus station, schools, kindergartens etc.

A solution must be found right away. The first need is to build other enterprises in Snechkus. People must have an alternative. If they don't want to work at the power plant, they should be able to leave it. Then the power-plant management would be forced to compete for workers. They would have to pay serious attention to public opinion and be concerned about worker safety at the plant and about the plant's effects on people and the environment. Only then will power-plant workers be able to look at the power plant and the situation there from a different point of view. Their opinions would carry much more weight.

All this is possible on one condition only. The new enterprises must not have any ties to any all-union ministry, especially the Ministry of Atomic Power. Otherwise, nothing will change. The number of enterprises would increase, but we would eliminate only the consequences of the problem; namely, unemployment. It is the cause of the problem which must be eliminated. Only republic-affiliated enterprises must be built in Snechkus. Otherwise, Snechkus will remain a "company" town, and that is the cause of all the problems. Lithuanian enterprises have attempted and are attempting to help, but it seems their offers are being rejected.

The ground under Snechkus belongs to Lithuania, not to the all-union ministries. If we want it to belong to us, then it's time to take the first step. It's a step that we can take today and that the republic's government has still not decided on: build something here that would belong to the republic.

The first attempt, unfortunately, was not exactly in that direction. On 14 December 1988, a government commission was to have signed a protocol for the construction site for an all-union plant in Snechkus. Despite the fact that the Council of Ministers of the Lithuanian SSR approved the protocol, several members of the commission (representing geologists, the State Committee for Protection of Nature and the Ministry of Health) in a rare moment dared to disagree with the central authorities and didn't sign it. Their reasons were: the documentation was incomplete, the project had not been approved by geologists or by our project designers, there were suspicions about the experimental effluent-treatment method, the plant was to use galvanic processes but there was no suitable place for processing and burying toxic materials, and the problem of air quality had not been completely resolved. We appreciate their resolve in opposing the decision "from above." Time was needed to think over this decision.

In conclusion, there are a few more things that should have been said much earlier. Now, when the fate of the third generating unit is again unclear, these things must be said. It is finally time to consider the ethical side of the question of nuclear power. Is it right to go to a relatively uninhabited area and build facilities which threaten the existence of a people? We entertain no illusions: geologically and geographically, the Ignalina AES is situated such that in the case of a Chernobyl-type accident, Lithuanians and other inhabitants would have to scatter across "our broad homeland" just like the people who were living near the Chernobyl AES. We need a fundamental answer to this question. Without it, what has been created in Lithuania (and not only in Lithuania) is unclear, and what awaits us in the future is also unclear. If we go by the cornerstone principles of morals and humanism, then there can be only one answer: anything that threatens the destruction of a people is immoral and cannot be justified in any manner. This is the main moral principle which we must follow in evaluating the construction of such projects. We must do our utmost to see that others adhere to this principle. The Ignalina AES is the result of the policy of the all-union ministries. This policy had (and unfortunately, has) nothing in common with the elementary norms of morals. But it must now meet these norms, for the times have changed.

Article Discusses 'Nuclear Power Nightmare'

18220072B Moscow SOTSIALISTICHESKAYA INDUSTRIYA in Russian 26 Feb 89 p 2

[Article by V. Zharikhin, power engineer: "Emotions Don't Make a Sound Argument"]

[Text] **Nuclear power is at the center of attention today. It is not respectful attention, as it was before, but critical and passionate attention. All publications willingly offer their pages to nuclear—or rather, antinuclear—publicity.**

Well, this discussion should have started long ago. The Chernobyl accident showed that the creation of areas immune to criticism not only erodes the political and economic structures of society, but also can have a pernicious effect on a whole sector of science and engineering. We can now say flatly that after Three-Mile Island in the West and Chernobyl here, the long, isolated existence of nuclear power in the dark shadow cast by "nuclear secrets" has caused an unprecedented crisis of public confidence which will haunt all nuclear-power programs for decades to come.

Moscow—Our main antinuclear publicist Boris Kurkin calls for and promises a complete shut-down of the nuclear power industry as the solution for all the problems caused by it. Kurkin is now everywhere: LITERATURNAYA GAZETA, YUNOST, SELSKAYA MOLODEZH, PYATOYE KOLESO, DVENADTSATYY ETAZH, TEKHNIKA-MOLODEZH and ZNANIYE-SILA. His recipe is simple and radical: do away with it so we can stop worrying! This seems all the more realistic because simple conservation can replace the 11 percent of our electricity generated by AES's. Sweden long ago chose that path, and Italy has done the same recently.

But that's the whole thing: even if "the unified forces with their rigid caste interest in the development of nuclear-power capacity at any cost" (YUNOST, No 1, 1989) are moved by the sharp and scathing pen of Boris Kurkin to suddenly see the light and go over to his side, other "forces" will have to solve the energy problem, and they will have to choose the same direction. Unfortunately, there are no alternatives to nuclear power for the next hundred years.

We have been charmed by that ecologically clean energy source called electricity, and we forget that it is produced at real hydroelectric, fossil-fuel and nuclear power plants. In its own way, each type of plant damages the environment and ultimately, mankind. We pay an unavoidable price for civilized existence, and even the most extreme opponent of nuclear power has not in fact rejected this existence. We need to look squarely at the truth: mankind has not yet learned how to generate electricity in the required quantities without damaging nature and mankind itself.

I don't really want to start saying that Kurkin is stretching some points or overdoing others, or that he is completely ignorant about several specific questions. It seems to me that in general, it is not constructive to discuss purely technical matters (especially in the popular press) with people who have no specialized training. What you would have is something like V. Shukshin's well-known story "Cut Down." Kurkin debated brilliantly with radiologists in PYATOYE KOLESO and with Academician N. Ponomarev-Stepnoy in DO I POSLE POLUNOCHI. They were simply "cut down." He used the arguments of Shukshin's hero almost word for word.

Well, OK, let's close down the AES's. But what do we replace them with?

Only irrigation specialists, two million of whom are looking for something to do, could imagine using small GES's to solve the energy problem of an industrial country. All you have to do is compare the total capacity of the 6614 small GES's which were operating here in the early 1950's (Kurkin's data) with the capacity of one operating TETs (of which there are over ten in Moscow). The capacity of that one TETs is about equal to the total capacity of all those small GES's!

So how many small GES's would we need, and are there enough people to operate them? There certainly aren't enough rivers for them all. What about building windmills with a total capacity of 150,000 megawatts to serve the entire country, like the blast furnaces in China during the "Great Leap Forward"?

Excuse me, but it is difficult to remain serious when discussing the positive part of Kurkin's concept. What do we have here? The unwillingness to add and multiply a few figures, or the certainty that no one will want to do that out of fear of being called reactionary?

By the way, will these millions of windmills be that ecologically harmless? What will happen to our climate if we begin using a large portion of the wind energy? The effect of scale is important. The isolated campfire of early man caused no noticeable damage, but hundreds of thermal electric power plants throughout the world are producing a greenhouse effect and polluting the atmosphere on a planetary scale. Even those seemingly harmless tidal power plants, according to the English periodical NEW SCIENTIST, would begin to cause serious ecological problems if operated on a commercial scale.

The attentive reader will ask: why 150,000 megawatts? After all, we're talking about the 11 percent of electricity generated at AES's. If we could conserve that much, we could forget about nuclear power forever, like a bad dream.

Now we come to the main weakness of the "positive program" of Kurkin and others. In articles of this type, one fact remains in the shadows: nearly all the rest of the electricity is produced in thermal power plants, which are causing planetary-scale ecological problems. The much-praised giant hydroelectric plants which dam nearly all our large rivers produce an insignificant proportion of the country's electricity.

At present, thermal power plants can only be replaced by nuclear plants. It is namely for these reasons, and not the evil doings of the nuclear-power lobby, that western countries are allocating large sums to the development of nuclear power.

Of course, we must conserve electricity. But we must not forget that all industrial countries produce (or purchase) much more per capita than the USSR. The quality of life for which we are striving so mightily is largely determined by electricity production. In developed countries, electricity is consumed not so much by heavy industry as by refrigerators, air conditioners and other domestic appliances.

Of course, we can go the route of Sweden, and now Italy, which are curtailing their nuclear-power programs. We can buy oil from the emirates when we run out of our own reserves. But where are we going to get the hard currency to pay for it? Will we be able in the near future to go into foreign markets and replace the Japanese as suppliers of VCR's and cars or replace the USA in computers? We still need to base our development on realistic alternatives. Our country will not become an exporter of finished goods and an importer of raw materials very soon. Until then, we must base our activities on our own energy sources.

For many years we have read in newspapers how people in the West have lived under the terrible oppression of an unavoidable nuclear nightmare. We were proud of our optimism, which was the optimism of ignorance rather than of sober evaluation. More than once or twice, we have been dangerously balanced at the very brink, and only now can we see how dangerous things were during the Caribbean crisis. Nevertheless, a subconscious fear had been building. The events of April 1986 triggered it.

In such a situation, it is understandable why the conclusions of the vice-president of the USSR Academy of Medical Sciences, Academician L. Ilin, who offered facts on the health effects of near-threshold doses of radiation, seem much less convincing than his opponents' conclusions, which were based only on emotions. Well, time will tell who was right. We should only remember that the people bandying about terms like rems and millirems are not making their extreme statements in an academic millieu, but rather are addressing them to millions of interested listeners and readers, thus subjecting them to additional psychological trauma. It is just as immoral to overstate the danger as it is to understate it. The morbid fear of radiation sometimes is no less crippling than the radiation itself.

For decades, the information from this enormous industrial sector, which employs many thousands of specialists, was sketchy and distorted. Apologists created the impression that everything was all right everywhere, and especially here. "Secret physics," with its stylish "black boxes," was obtaining enomous amounts of money, operating with super-modern equipment and producing things at least 100 times better than other sectors. Now, disappointment has swung the pendulum over to complete distrust.

After 1986, it turned out that the high fence was hiding the same tall weeds that grow on the outside. Behind the fence were the same people with the same problems: salary leveling dragged on for 10 years, monopolism blocked fresh ideas, the bureaucracies dominated the scene and scientific instruments were in poor supply. Moreover, these problems, which were common in the entire country, were aggravated (here I am in partial agreement with Boris Kurkin) by a cult of secrecy, which blocked open scientific discussions and the rapid development of scientific personnel.

Frost, in his very austere academic monograph "Nuclear Fuel Elements," written in 1982, quotes from the memoirs of Dyson, one of the pioneers of nuclear power in the USA. The quote was removed by the editors of the Russian translation, who apparently considered it to be a "lyrical digression." Dyson says that the main problem of nuclear power is the lack of fresh ideas and fundamentally new approaches and concepts. He notes that that spirit of passion and search which was present in the early years of nuclear power was gradually destroyed by bureaucrats and accountants, who are inclined toward the mutliplication and use of previous findings, and who are organically incapable of evaluating and supporting anything beyond the framework of the generally accepted. Thus, you can see that these problems are not ours alone.

Nonetheless, the future is for nuclear power: a nuclear power industry that is safe, technically perfected and open to public scrutiny. At one time, public opinion was not involved in the decision on whether or not to have nuclear power. This is no longer the case.

World Association of Nuclear Power Plant Operators Formed

18220132 Moscow IZVESTIYA in Russian 21 May 89 Morning Edition p 3

[Interview with O. Shumyatskiy, head of the press center of the World Assocation of Nuclear Power Plant Operators, by A. Illesh: "AES: An Exchange of Information"]

[Text] VAO AES is a new abbreviation only now entering our usage. It is expanded this way: World Association of Organizations Operating Nuclear Power Plants.

According to information at the beginning of this year there were 416 nuclear power plants in operation. 108 of them are currently under construction. In absolute electric capacity of AES's the United States occupies first place, France is second, and the USSR is third. The realization that the place of nuclear power engineering in today's world is somewhat established, but, alas, not totally safe, has compelled specialists to unite their efforts on a worldwide scale.

IZVESTIYA has already reported on the idea of creating such an organization. Now the constituent conference of the organizations forming the VAO is taking place in Moscow. What are the goals and tasks of this new organization?

One of the effective means of increasing security and reliability of nuclear power engineering is a mutual exchange of information on the use of AES's, says O. Shumyatskiy, head of the conference's press service. Now the operating organizations will be able to teach one another, to render mutual aid, and to increase the general safety to a level achieved by the world's best AES's.

[Illesh] What will the specific work of the VAO be?

[Shumyatskiy] Member countries of the association will compare and select for implementation the most effective solutions directed toward improving the technical means and equipment, and will share achievements in diagnostics and repair of AES's and experience in training nuclear plant personnel. The association will become a business club for nuclear power specialists.

All the regional centers of this organization (there are four of them—in Paris, Tokyo, Atlanta, and Moscow, and the coordinating center is in London) are planning to link up in a single computer system. The data base will be accessible to all VAO members. Groups of experts from one nuclear power plant will have the right to visit any other plant without hinderance.

[Illesh] Who was elected chairman of the committee?

[Shumyatskiy] The head of the Central Power Engineering Board of Great Britain, Lord Marshall. A. Abogyan from the USSR is on the association's board.

[Illesh] Today as never before society is dissatisfied with the secrecy of the country's nuclear power engineering. What does the creation of a global organization contribute in this sense?

[Shumyatskiy] This is an important step toward glasnost. No one today will seriously consider concealing any kind of information about events at an AES inside his own country when this data goes instantly to more than a hundred colleagues overseas. And this data can and must be used in any country.

The accident at the American plant in Pennsylvania pushed U.S. specialists to create an association of organizations operating nuclear power plants (completely responsible for safety). The Chernobyl tragedy placed this issue before the world. And thus the result of the realization by specialists of the complexities and importance of all the problems of nuclear power engineering is the creation of the VAO.

Survey Reveals Workers' Attitudes on Leasing Conditions

18280114 Moscow PRAVITELSTVENNYY VESTNIK in Russian No 6, Mar 89 p 8

[Article by V. Rutgayzer, doctor of Economic Sciences: "The Effect of Leasing: What a Public Opinion Poll Showed"]

[Text] Leasing relations are now being developed and have a great future. Just what is the attitude toward leasing? What is hindering and what is helping it? These questions became the theme of a poll made by the All-Union Center for the Study of Public Opinion at the VTsSPS [All-Union Central Trade Union Council] and USSR Goskomtrud. It was made in Moscow Oblast, where in the non-agrarian sector 700 enterprises are already working under leasing conditions. This makes possible quite a complete comparison of the advantages of the leasing system over other models of economic accountability.

The poll encompassed about 900 workers from 19 enterprises in four sectors (the building materials, local, trade and public catering industry). Over four-fifths were workers, 5-7 percent—specialists and employees, and 12—subdivision directors of various ranks.

The majority of them realize that they are working under new conditions of economic operation—either for leasing or for the first and second models of cost accounting. Nevertheless, quite a significant portion of the workers do not know what there is to know about it. Some 12 percent of those queried do not know the economic conditions under which they are working. The proportion of those who are ill-informed is still higher—16 percent, when it is a question of which form of economic activity the enterprise has adopted.

There are substantially more of them, when they must differentiate between the first model of cost accounting and the second. Every fourth person queried thinks that his enterprise is working, not on the first, and not on the second model, but under the conditions of some different economic form. The lessee's level of informedness is different—a total of 100 percent of those queried know that their enterprises have converted to leasing. It can be judged from this fact that leasing is able to overcome the apathy of the workers toward the economic affairs of "their" enterprises.

The question was asked of those queried: "In your opinion, which problems at the enterprise should be solved first of all, because of the transition to the new conditions of economic operations?" Here are the answers (a total of over 100 percent, since individuals queried mentioned various problems):

Increase in wages	74.2
Improvement in work conditions and mid-shift relaxation for workers	55.4
Replacement of obsolete equipment	54.9
Construction of housing, kindergartens (nurseries) health complexes at enterprises	53.3
Expansion of benefits to workers (additional payment for leave; payment to enterprises of income tax on workers' wages)	47.3
Continuous supply of raw material and materials	41.1
Elimination of wage leveling	39.1
Expansion of assortment of goods produced	31.0
Broader drawing in of workers and solutions to production and social problems of enterprise	26.6

As can be seen, the main reason for wishing to convert to the new economic operating conditions stems from the possibility of increasing wages. At the same time, the expectation of a change in the production sphere (equipment replacement, supply improvement, expansion of the products assortment) is weighty. All the same, this motive is in third place, and in second—the expectation of serious changes in the social sphere of the enterprises (improvement in work conditions and mid-shift relaxation, construction of housing and other social facilities and expansion of benefits). In fourth place is elimination of wage leveling. Participation in the management of their own enterprise is in fifth place among the motives.

The motives for transition to the new conditions of economic operations are related to all spheres of production and social activity. Leasing corresponds to these motives to a greater extent than the other forms of economic activity. Economic leasing relations create the conditions for conducting the economy more efficiently. This is caused not only by the striving to receive higher wages, but also by the interest in improving the production and social spheres of their enterprises. Also important is the fact that the transition to leasing itself has an effect on the situation of most of the enterprise workers, which differs advantageously from work under other economic conditions.

Here, the answers to the question, "Has anything changed for you personally?" are interesting. Most people (63 percent) answered affirmatively. Some 37 percent of the answers were negative and uncertain. The relations of the answers at leasing and other economically accountable enterprises differ noticeably. Almost 70 percent of the lessees answered unequivocally: "Yes, things have changed for me personally," and slightly over 20 percent of those queried answered "No" or "I don't know."

questions on specific changes will be more convincing (in percentages of the number of those who answered affirmatively on the changes that had taken place; the total answers were more than 100.0 percent):

	Leased enterprises	Other enterprises
Wages rose	51.7	25.1
Work load increased	36.0	31.0
Much more work required	64.4	73.0
Work became more interesting	30.5	11.9
Several occupations had to be combined	21.7	13.2
Greater participation of rank-and-file workers in solving production and social problems of the enterprise	16.6	10.3
Wages reduced	6.0	23.2
Work duties became more complicated	9.9	10.3
Danger of being discharged appeared	5.3	5.0
Hope of obtaining housing and solving other everyday problems grew	7.2	1.6

Most of the changes, for those who noted them, are connected with the increase in wages. Moreover, their rise is regarded as a normal reaction to an increased work load and greater work volume. True, at leased enterprises the proportion of those who notice an increase in wages is higher than the number of those who record an increase in the work load. At other economically accountable enterprises, the ratio is the opposite. At the same time, a considerable portion of those queried, particularly at leased enterprises, note that "the work became more interesting."

Here is the problem, however: how much are the changes perceived, not in someone's individual fate, but in the entire collective? It appeared that such changes due to the new forms of economic operation were less noticed.

It is characteristic that the proportion of unnoticed results of economic operation in the new way at leased enterprises is approximately double that in other collectives. At the same time, for almost every direction in the changes, the proportion of them noted among the lessees was higher than at the other enterprises. There is a particularly large difference in the attitudes toward improvement in the physical situation, reinforcement of work discipline and drawing workers into solving the problems of the enterprise. Obviously, much more was still expected from the transition to leasing than had actually been achieved in the six month period of work under leasing conditions. Leasing gives a considerable "starting" effect to the incomes of workers and their labor productivity. All the other changes require efforts taking more time. For the sake of objectivity, it is worth mentioning that the expectations which, at enterprises making the transition to a leasing situation, are sharply improved in the production and social sphere, were not justified. All the same, leasing, to all appearances, brings favorable changes more quickly than the first and second models of economic accountability.

In itself, the transition to leasing or to other forms of economic accountability, of course, is no guarantee against difficulties and problems. The attitude toward them changes, however. The production and social aspects of development of "their" enterprise is paid more attention, and the problem of wages, traditionally in first place, is moved back to third or even fourth place. This can be judged by the answers (in percentages of the total number queried) to the question: "What could not be solved, and what remained unchanged after the transition to the present system of economic operation?"

	Leased enterprises	Other enterprises
Obsolete equipment	52.7	59.6
Interruptions in supply of raw materials and materials	41.6	42.3
Long periods to obtain housing and solve other social-everyday problems	24.0	36.4
Low wages for workers	15.0	35.4
Poor assortment of goods produced	20.8	22.9
Insignificant role of workers and social organizations in enterprise management	18.7	16.3
Retention of enterprise dependence on higher organs in planning economic activity and spending internal funds	15.9	19.7
Retention of wage leveling	11.8	13.8
Conflicts related to release (discharging, cutback) of workers	3.7	6.6

The transition to the new conditions of economic operation substantially expands the range of interests of the workers. They are much more sensitive than before about lagging behind in the level of development of the production and social base of their own enterprise.

As far as the development of the social sphere at the enterprises is concerned, here the evaluations are somewhat different in the two categories of those queried (at leased and other economically accountable enterprises). The lessees "set down" higher points for the changes in this sphere. Substantially lower among the lessees queried is the proportion of those who noted that, as the result of the transition to the new conditions of economic activity, as before, low wages were retained (respectively 15.0 and 35.4 percent). All of this indicates that at the leased enterprises a more favorable social-psychological climate is formed.

Let us sum up the results of the study. It clearly attests to the fact that leasing ensures more favorable conditions for economic activity. It contributes to intensifying the economic independence of enterprises on the basis of the transition from good management of state property to the relations of its ownership by the work collective. Each worker at a leased enterprise, to a greater extent than in any other form of economic activity, feels himself to be a real master. Hence, of course, there are higher economic and social results from the work collective's leasing its own enterprise.

The study showed: the greatest obstructions in the path of introducing leasing occur where it conflicts with the established conditions of economic operations. These are above all the entire palisade of obsolete instructions, in no way corresponding to the principles of ownership of state property by the work collective. It is clear that as this takes place, many leased enterprises become tangled up in paper work.

In the opinion of the participants in the poll, leasing is creating an economic situation new in principle, with which administrative-command methods of management cannot get along. This pertains particularly to the sectorial headquarters—the ministries and main administrations. Under the conditions of leasing, the enterprises do not need petty surveillance from above, and directives about regulation of the production program and the conditions of distributing the cost accounting income and forming wages.

At the same time, the participants in the poll expressed many complaints about how the management functions, which the lessees objectively need, were being fulfilled. It is a question of breakdowns in material-technical supply and of chronic dragging out of the periods for introducing advanced scientific-technical achievements. Many, in connection with this, asked the question: is there any need for a managerial superstructure? The sectorial administrative system in its present form is a real obstacle in the path of leased enterprises.

The transition to leasing clearly revealed the useless surplus of information concentrated at the enterprise. In the opinion of those taking part in the poll, all the "figuring" coming to the top should be reduced to accounts on the fulfillment of the financial obligations and the State order. Accountability can and must be reduced three-four-fold. The idea was expressed that there is a need for the transition from lease payments to a one-time tax from the revenues of the leased enterprises, regardless of their sectorial affiliation. It was emphasized that this requires different conditions for price formation, which would make it possible to overcome the substantial difference in the profitability levels in various sectors of the economy. After all, in this case the interrelations of the leased enterprises and the budget would be transparently clear—each leased collective would have an idea of what part of his own income was to be deducted for the state budget, independent of the agreements with the higher administrative organs.

Proposals on improving the social policy at leased enterprises merit attention. So far it is excessively centralized and overly State-controlled. The lessees themselves feel that, without any damage to fulfillment of the program, they should be granted the right to reduce the 41-hour work week by one hour. True, a certain reduction in wages is possible here. But after all, by no means everything is measured in monetary terms. The collective itself has the right to decide how it is most convenient and advantageous for it to work. The same thing is true of all the questions as to how to increase to 24 the number of days of leave for all categories of workers, pay additional remuneration for going on leave, and pay, through the aggregate income of the leased enterprises, the workers' income tax.

Of course, the questions posed are not ones that can be solved in an hour. As they say, however, they are food for thought.

Leasing Method Saves Enterprise from Insolvency

18280097 Moscow TRUD in Russian 24 Mar 89 pp 1-2

[Article by P. Varfolomeyev, TRUD Correspondent: "How Can Bankruptcy Be Avoided? The Collective at the Kursk Bearing Plant is Being Converted to the New Conditions of Management"]

[Text] **Today the editors are inaugurating a new column "Lease Diary: Month After Month." All materials that we intend to publish under this rubric will be devoted to one enterprise—Kursk State Bearing Plant No 20 and, moreover, the plan is to show—step by step—all stages in the conversion of a large machine building enterprise to fundamentally new conditions of management, to follow the tempo of events occurring at the plant, the successes and potential failures; to analyze what is changing here at the level of the brigade, sector, shop; to depict changes as they appear to the worker, technologist, economist, manager; and to show the kind of results that are attained...**

Leasing is new to industry. Will it help to extricate enterprises from bankruptcy or will it be unable to do so? It is difficult to answer this question today. But this is very important to know because we have very many unprofitable enterprises. Of course, it is impossible to draw global generalizations and conclusions on the basis of the study of the events at one plant. Nevertheless we do not doubt that the analysis of the life of one collective will provide rich food for thought.

GPZ-20 is just beginning to make the transition to leasing. And this makes it beginning to begin the story from the very first steps, from the preparation for this important step, which, as is known, largely predetermines

the success of the entire effort starting with the difficult search for ways of extricating the enterprise from the deep abyss in which the Kursk Plant presently finds itself.

No payroll funds

The critical financial situation became still more obvious after the USSR People's Control Committee discovered instances of large-scale falsification of performance figures at the plant. After this (when falsifications were excluded from the calculations), the percent of plan fulfillment in 1987 was 88 percent and in the past—80 percent. In November, the bank ceased financing the enterprise, when went bankrupt. The plant did not even have the funds required to meet its payroll. Matters reached a point where the city public catering service sold lunches in plant dining rooms and kindergartens on credit.

What is the situation today?

The plant's "visiting card":

Products: 350 different kinds of bearings that are supplied to enterprises in 12 branches and exported to 36 countries.

Work force: 7038 persons.

Average pay: 21 rubles.

Fixed capital: 23 shops; production area—121,300 m^2; 4338 units of equipment with a combined value of 79.3 million rubles.

Annual production volume: 61 million rubles. Last year, the shortfall in the supply of products to customers was valued at nine million rubles. A number of export deliveries were not met.

Financial status: indebtedness to suppliers and to bank for loans—10,522,000 rubles. No uncommitted funds in bank account.

These are raw data. The reference point in a manner of speaking. We will regularly compare future measurements of production indicators against it.

How did they come to such a life?

When the construction of a new plant began on the outskirts of Kursk in the early seventies, many people resolved to connect their hopes and plans with it: interesting work, decent pay, and the prospect of obtaining housing in a short time. But there were few who knew that the plant and its future collective were doomed to vegetate for many years even before the plant's foundation was laid. This was because the Ministry of the Automotive Industry (the present Ministry of Automotive and Agricultural Machine Building) programmed it from the very beginning as an enterprise that would operate at a planned loss. This was entirely natural for those times. But what does an unprofitable plant mean for a branch that has such giants as ZIL, GAZ, and AvtoVAZ? Can it be they will not feed it?

And indeed they "fed" it all these years. The last time—in 1987—the subsidy was about 10 million rubles. However, with the transition to economic accountability, this "system" could not function any longer.

But why was the plant created to operate at a planned loss? Why did the branch headquarters deliberately program losses here instead of profits. How could such a situation develop when the products needed by the country are deliberately unprofitable? We will return to these questions in subsequent publications. The present situation here is as follows.

Today 87 percent of the products produced by the GPZ yield losses not profits. Over 300 (out of 350) products are unprofitable. Their price has not changed for many years. At the same time, the prices of metal, tools, and equipment are rising. For example, the first groove grinders cost the plant 20,000 rubles each. Today, they cost 140,000 rubles even though they have gained but little in productivity.

This is what Ye. Panov, the plant's deputy director for economics, has to say:

I happened by a hardware store and saw one of our bearings in the window. It cost 18 kopecks. Next to it was an ordinary seal for sealing containers. It cost 16 kopecks. A tiny bearing, because it is so tiny, required the craftsmanship of a jeweler and the efforts of hundreds of people, while a simple piece of lead with two holes costs almost the same amount.

But the deformations in price formation are naturally not the only reason why the enterprise finds itself in a financial hole. Old-timers remember when the plant was put into operation to the sound of kettledrums and the rustle of banners passing by. The words: "Kursk bearings are here!" were highlighted in red in the triumphant report. But no one anywhere ever said a word that the bearings were here but that the collective of many thousand people did not get their own Young Pioneer camp in almost 20 years. That it has no holiday center, no preventive clinic, no sports complex. It has only shops that are from time to time shut down by technical labor inspectors from the central committee of the branch trade union because of bad, occasionally intolerable working conditions. Some production areas are totally unventilated, while the density of the oily haze is several times higher than the sanitary norms.

Hence the increase in morbidity (lost working time due to illness) in the year before last totaled 50,087 man-days; last year—86,387. If we add to all this the waiting

list for housing (more than 1500 persons), we can easily understand what was hidden behind this most vivid phrase in the triumphant report.

The worst and most terrible thing is that the devil-may-care attitude of the ministry and the plant management toward the fate of the enterprise was inevitably also refracted in the attitude toward people who were accustomed to living from the ministry's "handouts" and counting on its "mercy." From year to year, defective output increased and labor discipline declined. Here is just one figure about absenteeism. Absenteeism jumped by 60 percent compared with the preceding year. During the same period, about 800 persons quit their jobs at the plant despite the very acute shortage of working hands! Thus did external and internal factors combine to generate the crisis situation in which the collective found itself.

A candid talk

What is the solution? Not so long ago, representatives of production links gathered at an expanded sitting of the work collective council to decide how to live in the future. Representatives of the ministry and the main administration were present. The talk was long and difficult. Today there is no longer any time to wait to put wholesale prices into order, and this, as was stated, is by no means the only reason for the failure. Given the transition to economic accountability, the plant must be extricated from the abyss or else it must be closed down...

The absolute majority spoke out in favor of the lease contract: people were literally burning with desire to rescue their enterprise from the very real threat of being closed down. But there were also many doubts. For example, A. Smirnov, a member of the plant's STK, said: "I am confident about the workers, that they won't let us down. Let us rather ask our managers and specialists whether they will be able to provide everything that is necessary for high-quality, uninterrupted work?"

This was by no means an idle question. The worker had every reason to call S. Kuzin, the plant's deputy chief engineer, to task for continuous interruptions in the production preparation sector, and to call M. Levin, the deputy chief engineer for equipment, to task for failing to secure the smooth, troublefree operation of machine tools and mechanisms.

V. Gridasov, chairman of the plant's brigade leaders' council, was highly critical of the labor and wages department. "Department personnel," he said, "almost never visit the brigades. All they care about is handing out the work targets. But we need continuous assistance in organizing accounting and in planning. This is absolutely essential when you are operating under a lease contract..."

Here, too, one cannot but agree with the workers. They have pinpointed the sorest spot, the plant's main problem: production organization and the creation of conditions for effective labor. Without this you can't introduce the lease contract. Without this you can't activate the anticost mechanism.

There were also many constructive proposals. In particular, it was noted that the plant has accumulated much above-norm equipment and many material resources. They give nothing except new debts. It is necessary to get rid of everything superfluous immediately and thereby win several millions. Another extremely urgent question: the incredibly inflated administrative apparatus. It is no joke that there is a supervisor for every 5-6 workers! What do they contribute, participants in the meeting asked, if in the last few years there has been virtually no increase in labor productivity? It has remained at its previous level. But pay has increased at the same time. The pay of personnel in management services increased by 16.2 percent in 2 years.

This talk was candid and open. It was followed by talks and meetings in shops and brigades. Thus a contract was prepared with a higher organization—GPO "Podshipnik" on the transition to lease relations.

What are the contract's main points? The collective must lease all plant property and normed working capital up to the year 2000. Under the contract, the GPO conveys the state order and economic norms to the plant, specifies the payments that are to be made by the collective, and provides it with material and energy resources (naturally, not free of charge). It is also important to emphasize something else: the GPO uses state budget funds to finance the construction of important production and social facilities and assists the plant in technical retooling.

The plant, in turn, will lease productive capital (buildings, equipment) to collectives of shops, brigades, and sectors and to cooperatives.

The wage, social development, and production development funds will be formed on the basis of agreement between the administration, the STK, and the trade union committee. The contract stipulates that the enterprise has the right to introduce new pay terms for personnel (at the expense of and within the limits of the earned wage fund).

The grinding-assembly shop was the first to make the transition to the lease program.

Banking on initiative

Where are the reserves that will help the plant to become profitable? First, the collective is planning to increase the volume of production almost 1.5-fold (compared with last year). The highest monthly level (which was reached in September and October 1987) was taken as the basis

of the calculations. People at the plant believe that if the work is properly organized, this tempo can be sustained continuously. GPZ-20 is also planning to increase the production of other products, e. g., water pump covers for VAZ automobiles and to expand deliveries of cooperatively-produced castings to a million rubles.

The plant is also developing measures to reduce production costs. According to last year's plan (!), production costs were 105.5 kopecks per ruble of commodity output. If material costs were reduced by just 6 kopecks (per ruble of output), the saving will be 3.6 million rubles. Calculations by plant specialists show that this is entirely practicable.

There is one more economy item: reduction of the management apparatus. This reduction will make it possible to economize 100,000-200,000 rubles in the wage fund and to channel additional funds into material incentives for the work force.

What are the results the GPZ-20 collective hopes to attain this year? Here is a rough outline: an increase in output; the fulfillment of the year plan by 29 December; the assimilation of 20 new bearings and the certification of 90 products (for an aggregate sum of 27 million rubles) for the Quality Emblem; an increase in labor productivity by 0.5 percent compared with the plan; commencing construction of a 108-unit apartment house...

The plans, as we see, even though modest are quite intensive. If the collective succeeds in putting an end to unprofitable operation and in paying off its debts before the end of the year, this in itself will be a major accomplishment. We will describe the future turn of events in subsequent publications.

Considering the difficult economic situation of Kursk GPZ-20, the higher organization—the "Podshipnik" Association—exempted it from making lease payments in 1989-1990. During the same period, the plant is exempted from making payments for productive fixed capital and branch payments to the state budget. Subsequently, as the collective amasses cost-accounting income, the question of gradually canceling all payments in 1989-1990 will be addressed.

Payment for raw materials, supplies, and power will amount to 27 million rubles in 1989.

Payment for bank credit will total 0.5 million rubles.

It is proposed for form the wage fund in the amount of 18.2 million rubles; 1.4 million rubles are allocated for material incentives.

The social development fund will total 5.1 million rubles.

The science and technology development fund will total 8.5 million rubles.

The plant plans to receive 61 million rubles for its output.

Legal Expert Clarifies Labor Protection Rights for Women

18280096 Moscow SOVETSKIYE PROFSOYUZY in Russian No 5, Mar 89 pp 42-43

[Article by N. Brilliantova, lawyer: "Workplace Health and Safety for Women"]

[Text]

I. Restrictions for Health Reasons

Women are prohibited from performing hazardous and strenuous work

Women, like men, exercise their right to work by concluding a labor contract. However, labor legislation imposes some restrictions on the hiring of women. Thus, Art. 160 of the RSFSR Labor Code prohibits the employment of women in hazardous and strenuous work. A decree of the USSR State Committee for Labor and Social Problems and the Presidium of the All-Union Central Council of Trade Unions (with amendments dated 26 March 1987) approved the List of Production Facilities, Occupations, and Jobs Involving Strenuous and Hazardous Conditions in Which the Employment of Women is Prohibited.

What is more, the 13 July 1957 decree of the USSR Council of Ministers "On Measures to Replace Female Labor in Underground Jobs in the Mining Industry and Underground Construction" prohibits the hiring of women for underground work except for managerial, nonphysical, sanitary, and service positions. For example, women are allowed to work as chiefs (directors), chief engineers, engineers, technicians, and in other managerial engineering-technical positions in coal mines, ore mines, and nonmetal ore mines, in the construction of subways, tunnels, etc., as long as they do not perform physical labor: to work as physicians, as secondary and junior medical personnel; as snack bar attendants, etc.

Norms governing the maximum weight women may carry from one place to another

Norms have been established regarding the maximum weight women may carry from one place to another. They were approved on 27 January 1982 by a decree of the USSR State Committee for Labor and Social Problems and the Presidium of the All-Union Central Council of Trade Unions with the consent of the USSR Ministry of Health. The maximum weight a woman may lift and move to another location is 15 kilograms. The maximum weight a woman may lift to a height of 1.5 meters or more is 10 kilograms. The aggregate weight moved by a woman during a work shift may not exceed 7000 kilograms.

Restrictions on women's night work.

Art. 161 of the RSFSR Labor Code states that women may not be hired to perform night work (that is, from 10 PM to 6 AM) with the exception of certain branches of the national economy where this is due to special necessity and is allowed as a temporary measure. Here, the duration of night work is reduced by 1 hour (with the exception of categories of working women authorized to work an abbreviated schedule or women who working under continuous production conditions). Higher additional pay is instituted for night work. For example, workers employed in certain shops and sectors of the newspaper printing industry receive a 50 percent increase in their hourly wage rate; workers at textile industry enterprises receive a 75 percent increase in their hourly wage rate. In the majority of branches of the national economy, the additional pay for night work is 40 percent of the hourly wage rate (salary) for each hour of work.

II. Benefits for the Working Mom

Guarantees regarding the hiring and firing of pregnant women and women with children under 1.5 years of age.

Labor legislation establishes a number of benefits enabling women to combine work with motherhood. Art. 170 of the RSFSR Labor Code in particular prohibits refusing to hire women and lowering their pay because they are pregnant or nursing a child. It is a crime to refuse them employment (Art. 139, RSFSR Criminal Code).

Pregnant women and women with children under 1.5 years of age may not be dismissed at the initiative of the administration unless an enterprise (institution, organization) is entirely closed down; in such instances, it is mandatory that they be provided with other employment. It is also mandatory that the administration find employment for women in these categories if they are dismissed prior to the expiration of their labor contract.

The prohibition against hiring pregnant women and women with children with children under 2 years of age for night work, for overtime work, for work on days off, for watch duty, and for work involving travel.

In the interest of protecting the health of the pregnant woman and her future child and of ensuring the normal care of the small child, Art. 162 of the RSFSR Labor Code prohibits hiring pregnant women and women with children under 2 years of age for night work, for overtime work, for work on days off, and work involving travel. The refusal of women in these categories to perform such work cannot be regarded as a disciplinary infraction. Women with children between the ages of 2 and 8 years may be assigned to overtime work or work involving travel only with their consent. At the same time, it should remembered that they may perform overtime work only in exceptional cases indicated in Art. 55 of the RSFSR Labor Code on the basis of a signed order of the administration and with the authorization of the trade union committee. Overtime work is remunerated at a higher rate based on norms in Art. 88 of the RSFSR Labor Code.

Women assigned to work involving official travel must be paid in accordance with the 18 March 1988 decree of the USSR Council of Ministers "On Official Travel Within the USSR."

According to the 2 April 1954 decree of the Secretariat of the All-Union Central Council of Trade Unions "On Watch Duty at Enterprises and in Institutions," pregnant women and women with children under the age of 12 years may not be assigned to watch duty at the end of the work day, at night, or on days off and holidays.

The transfer of pregnant women to lighter work.

Under Art. 164 of the RSFSR Labor Code, pregnant women may for medical reasons be transferred to other, easier work that precludes the influence of adverse production factors. This transfer remains in effect for the entire period of pregnancy, i. e., before the women's pregnancy and maternity leave. During the entire transfer period, pregnant women retain their average pay at their former job, which is computed for the last 6 months of work.

Women with children under 1.5 years of age, who are transferred to other work in the event they are unable to perform their previous job, retain their average pay at their previous job until the child is 1.5 years of age.

Pregnancy, maternity, and child-care leave.

All working women, regardless of time on the job, are authorized 56 calendar days of pregnancy and maternity leave and 56 calendar days of postmaternity leave. In the event of an abnormal birth or the birth of two or more children, postmaternity leave is 70 calendar days (Art. 165 of the RSFSR Labor Code). Prenatal leave is scheduled to be increased from 56 to 70 calendar days under the 12th Five-Year Plan. Women retain their job and position all during their leave period. During this period, the women are paid a grant in the amount of 100 percent of their pay.

Women who adopt a newborn child directly from a maternity home are granted leave from the date of the adoption for 56 days following the birth of the child.

A woman who so requests may also be granted partially paid child care leave until the child is 1 year of age. She must have worked at least 1 year to qualify for this type of leave. During this period, women are paid a child care grant in the following amounts: in regions of the Far East and Siberia; in northern regions of the nation (the Karelian ASSR, Komi ASSR, Arkhangelsk Oblast, Murmansk Oblast); and in Volgograd, Novgorod, and Pskov

oblasts—50 rubles a month; elsewhere—35 rubles a month. This leave time is counted toward total work seniority. Such leave may also be granted to women adopting children directly from maternity homes.

If a woman who is on child care leave so desires, she may work on a part-time basis or may work at home. She will retain the right to receive the above-indicated child care grant (Art. 165 of the RSFSR Labor Code in the 29 September 1987 version).

Art. 49 of the RSFSR Labor Code states that the administration is obligated to grant the request of a pregnant woman, a woman who has a child under the age of 8 years, or who is caring for a sick family member for medical reasons to work a shorter day or week. Pay in such cases will be in proportion to time worked or will depend on output. Working under these terms does not entail any restriction of the woman's labor rights.

In addition to pregnancy, maternity, and child care leave, a woman may request additional leave without pay to care for a child until he reaches 1.5 years of age. All or part of this leave may be used at any time until the child is 1.5 years old. It is counted toward aggregate, continuous job seniority. However, additional leave without pay does not count toward job seniority which confers entitlement to annual leave (Art. 167 of the RSFSR Labor Code).

Annual leave.

Before pregnancy and maternity leave or immediately after giving birth, a woman may, at her request, be granted annual leave regardless of the length of time worked at a given enterprise (institution, organization) (Art. 166, RSFSR Labor Code). It is granted in full measure and is not in proportion to time worked even if the woman is not yet entitled to leave (i. e., she has not worked 11 months at a given enterprise).

The 22 January 1981 decree of the CPSU Central Committee and USSR Council of Ministers "On Measures to Strengthen State Aid to Families With Children" introduced additional 3-day leaves for women with two or more children under the age of 12. It is granted in addition to annual (basic and additional leave) on the condition that total annual leave time not exceed 28 calendar days. Women with two or more children under the age of 12 years are entitled to top priority in taking their leave in the summer or at another time that is convenient to them.

This category of women is also entitled to up to 2 weeks of additional leave without pay, which is granted with the permission of the administration when production conditions permit.

Child-feeding breaks

In addition to lunch and rest breaks, women with children under the age of 1.5 years, receive additional child-feeding breaks (Art. 169, RSFSR Labor Code). These breaks must not exceed 30 minutes. These breaks are scheduled at least every 3 hours. They are included in the woman's working time and are paid on the basis of average pay calculated on the basis of the last 2 months of work.

The specific duration of these breaks and the procedure for granting them are fixed by the administration of the enterprise (institution, organization) in agreement with the trade union committee and with due regard to the mother's wishes. If a woman is unable to use the break that is granted to her (for example, if her place of work is too distant from her home), she may either combine the child-feeding break with the rest and lunch break or may combine all child-feeding breaks and defer them until the end of the work day and thereby leave work the given number of hours earlier.

PRODUCTION

Defense Conversion: Molniya Medium Machine-Building Plant in Moscow

18010497b Moscow IZVESTIYA in Russian 2 Apr 89 Morning Edition p 2

[Report by V. Romanyuk, Moscow: "Molniya Changes Its Program: Report From a Military Plant Converting to Civilian Production".]

[Text] There is no sign or marker at the entrance to the Molniya Machine-Building Plant. The curtain of secrecy has still not been lifted there. I only had to show my press pass in order to get onto the grounds, however. One would like to think that this is a sign of the times.

For many years the plant specialized in defense industrial production. The decision to convert the plant was no surprise to the collective, however. Plant director N. Mironov had made every effort to reorient his production specialists and designers toward the output of "alternative products." Just what kind? I would remind the reader that as one of the defense ministries the USSR Ministry of Medium machine Building was assigned the job of providing food industry enterprises with equipment. For this purpose Molniya cooperated with two "civilian" plants: Makhachkala and Plavsk in Tula Oblast, which produced industrial separators.

It should be mentioned that during the years the plants were under the Ministry of Machine Building for Light and Food Industry and Household Appliances, both of them lagged greatly in their development and presently have very worn-out equipment, and a significant part of their output is clearly not of good quality.

Molniya and other plants of the Ministry of Medium Machine Building rapidly mastered the production of a group of parts for separators. This did not prove difficult. Furthermore, volumes were small. The plants dragged out the 1988 program. It was clear, however, that the equipment produced does not satisfy today's consumers in either quantity or quality. In order to raise up the partners and get them on their feet, however, it was not enough simply to take them in tow. There had to be a merging with them. And an association, the Molniya Machine-Building Plant, came into being.

"It is an inevitable process; the production of defense products is tending toward curtailment," N. Mironov told me. "On the other hand, we are to increase the output of separators by 35-40% in 1990. Our leading specialists have been sent to Makhachkala and Plavsk. They will determine the capabilities and prospects for development of the two plants. A facility for developing and manufacturing prototypes of new separators will be set up on Molniya grounds. We are working out arrangements for developing the production of small batches of these units, which are popular with agricultural workers.

I asked the general director whether the conversion would not result in problems of a purely human nature due to loss of occupation and a drop in earnings. Nikolay Sergeyevich replied that it is easy for the machine builders to re-specialize, since there were actually no special advantages with respect to wages for the military plant's workers. It is not just a manner of similarity of the operations, of course. The main thing is that the "defense operation" developed and solidified in the working class such qualities, so essential today, as a high level of professionalism, responsibility and self-discipline—I would even say pride in their work

The assembly area alone will require freeing up 3,000-4,000 square meters of space. The production processes are being rearranged in the machine shops, and a second shift will be filled out in the future. Setting up the complete production cycle will require the purchase of heavy lathes and special equipment, particularly equipment for producing rolled parts from sheet metal.

Many prospects for growth are opening up also for the collectives of branch plants. And not just in the production of industrial separators. The plant presently produces more than 250,000 Plava manual separators annually as consumer goods, and the demand for them continues to grow. This is something for the association leaders to think about.

"We began on a small scale," said A. Popenko, chief of Machine Shop No. 4. "The list of parts is greater today, around 50, and they are produced in large lots. Civilian products already account for almost one third of the total volume."

I met A. Bazanov, adjuster of program-controlled machine-tools. In addition to parts for the defense items, he also works on separator assemblies. Permissible tolerances are approximately the same, but the semifinished products from Plavsk are of poor quality and have large deviations.

I was told that when the Molniya workers first went to Plavsk, they were unable to produce the quota on the equipment; it was in such disrepair. They were accustomed to a different quality of work. And now one of the tasks is to convert to peacetime production and begin teaching the defense industry workers to do good work. Chief engineer V. Nikolaychev who accompanied us to the shop told me that he sees the main danger in the conversion to peacetime production precisely in the possibility that quality and performance requirements could drop. It is a real danger: Molniya has long operated with the "zero defect" principle. The time limits are not as rigid there as at the branch plants, however. If the usual "civilian" job rates are extended to the Moscow workers, they are unlikely to meet the targets, and quality could indeed deteriorate. And so, the conversion is not without its problems.

Let me say also that the association is presently producing the separators at a loss. This means that ways must be sought to achieve profitability, and economic accountability must be enhanced..

Getting rid of the losses is just half of the job. Currency will be needed to purchase the modern equipment. In order to earn enough of it, competitive products will have to be produced. The grade of the items must be resolutely improved, and the warranty of defect-free operation will have to be extended several times over. The development section of the former Ministry of Machine Building for the Light and Food Industry and Household Appliances, which previously designed the separators, is being turned over to association.

And so, the military plant has begun the process of converting. This means that sooner or later it is bound to encounter problems typical of the civilian branches. And they are already beginning to make themselves felt. First of all, the pricing system has not been adjusted. The current procedure for setting prices for the separators provides absolutely no incentive to increase the service life of the assemblies. A similar Swedish separator with an electronic system is dozens of times more expensive, but its warranty is many times longer than ours. Ours is of an outmoded design, and it has a warranty of only 18 months. The infamous "gross-numbers approach," the orientation toward outlays and difficulties with material and technical supply are hindering things. When defense industry products were produced materials were supplied on a priority basis. Now, however, the supply problems to which the "civilians" are accustomed will make themselves fully felt.

I would also note that the conversion of Molniya involves not just the separators. A year ago, having just heard of the proposed changes in the production program, the collective entered into creative collaboration with the Institute of Atomic Energy imeni Kurchatov. A temporary scientific production team was set up, which fairly rapidly created a plant like nothing else in the nation. Its purpose was to strengthen the machine parts, particularly the cutting tools, by means of ionic implantation. A particular advantage of the technology is that it does not alter the configuration of the part and therefore does not require additional grinding.

I was taken to the section where the installation of the first three units is being completed. The installation is being performed by a group headed by N. Razgonyayev, deputy chief of the new equipment section. Nikolay Ivanovich told me that the plant could produce up to 20,000 of the units a year. The technology for strengthening various types of tools still has to be worked out. Orders have already been received from machine builders and electricians. This is understandable, since the new method produces tools with double or triple the strength of those produced by the existing method: milling cutters, drills, tap-borers and turbine vanes.

It is also planned to set up the production of computer networking equipment at the head plant. This is an extremely science-intensive operation, whose purpose is to link enterprises or territories into an electronic computer network.

Conversion, a new concept for us, is becoming increasingly firmly established in the economy and in our life. It is calculated that under the 13th Five-year Plan conversion will have affected 50% of Molniya's production capacities; 70%, when branch plants are taken into account. The technical production capability of the military plant is increasingly being oriented toward the output of peacetime products.

TECHNOLOGY ACQUISITION, ASSIMILATION, COOPERATION

Krasnyy Proletariy, FRG Firm Cooperate in Developing NC Lathes

18230055 Moscow SOTSIALISTICHESKAYA INDUSTRIYA in Russian 13 Jun 89 p 1

[TASS report: "Long Range Cooperation"]

[Text] The West German firm "Emag" has become an active manufacturing partner of Soviet machine tool makers. Jointly with the Moscow association "Krasnyy Proletariy," specialists from the FRG have developed and successfully tested an experimental model of a semiautomatic lathe with numerical control (NC). In accordance with the agreement concluded on the principles of international cooperation, long range prospects for further cooperation have been determined.

Thus, on the basis of this successful "first," it has been decided to create a series, which will include a number of variants depending on the designation of the aggregates.

Kursk 'Chetmash' Association Produces New Computer

18230047 Moscow SOTSIALISTICHESKAYA INDUSTRIYA in Russian 18 May 89 p 2

[Unattributed report]

[Text] The products of the Kursk Chetmash production association are well known in our country. This is especially true of tool makers, to whom Chetmash delivers numerically controlled (NC) systems.

The "Iskra-1030" personal computer, also manufactured by the Kursk electronics workers, is a reliable aide to a businessman. This machine has received almost no complaints. But time does not stand still—recently a successful test was carried out of a basically new machine, the "Istra-4816." Now preparations are going on for its series production. The association will produce the "Istra-4816" jointly with the Yugoslav firm "Rudi-Chayavets."

This year over 10 of these new computers will be delivered to Yugoslav customers.

Chetmash is also looking for other variants of international cooperation for producing computer equipment, and is setting up contacts with firms in the United State and West Germany.

ROBOTICS

Sophisticated Robot Created by Mogilev Production Association

18230059 Moscow SOTSIALISTICHESKAYA INDUSTRIYA in Russian 24 Jun 89 p 1

[Article by V. Nazarovich: "The Robot Learns and Teaches"]

[Text] The new TUR-10KM robot is a testament to the talents of its creators, the specialists of the Mogilev production association "Tekhnopribor." In the same shop where the first manipulators were assembled, they "asked" the innovation to draw its own and a woman's portrait in a three-color format. The mechanical worker coped with the task literally in 5 minutes, confirming the ideal coordination of its movements.

The TUR-10KM represents the third generation of Mogilev robots, and it is more compact and improved. It can replace a welder or punch operator, carry out milling of parts and assembly of aggregate parts, load and unload freight weighing up to 10 kg, and fulfill other technological operations. The most important thing is that it can continue to function under corrosive conditions.

"This new robot is a trained mechanical worker," says the enterprise's chief engineer, A Luksha. "It does not need the service of a programmer because it memorizes all the movements and actions of its operator and repeats them with great accuracy, and it stores the accumulated knowledge in its memory. Although the new robot works either in an autonomous regime or in automated lines or complexes, it is more cost effective to use this very complicated equipment in groups."

Military Transport Hauls Civilian Cargo

18010654b Moscow KRASNAYA ZVEZDA in Russian 1 May 89 First Edition p 1

[Response to question from editors by Col Gen Avn V. Yefanov, commander of the Military Transport Aviation, under the rubric "With the Same Concerns as the People": "Strawberries—on Military Aircraft"]

[Text] **Col Gen Avn V. Yefanov, commander of the Military Transport Aviation, responds to a question posed by the editors about what kind of assistance the Military Transport Aviation is providing the national economy.**

The main missions of the Military Transport Aviation, as we know, are to support the combat training plan and the vital functioning of the Armed Forces of the USSR. We have also managed to find internal reserves for helping the nation's workers, however. Beginning in May the Military Transport Aviation will provide more extensive assistance to the national economy. Empty training flights have been eliminated, for example. It is useful for the crews to be able also to carry them out with different types of cargo and to become familiar with new regions. I want to stress the fact that the Military Transport Aviation has performed such missions even in the past. There are many examples. They include Afghanistan, Chernobyl, Armenia.... The crews have performed heroically. Their service is unique: like sailors, they are almost never at home.

We will be hauling food and various types of freight primarily to areas of the Far North and Far East. A new air transport system is being set up to supplement the capabilities of the Ministry of Civil Aviation. Approximately 60 aircraft will be involved. They will haul around 50,000 tons of national economic cargo. Around 70% of the profit from the transport operations will go into the state budget. The USSR Ministry of Defense will use the rest to pay expenses stemming from those operations and as material incentives for the airmen.

Do we have acute problems? It is somehow not customary to talk about them on holidays, of course. I have to say something about housing, however. Thousands of families are without apartments, and living conditions at the garrisons are poor. It is planned also to resolve these problems with the earnings from the transport operations.

I want to see the airmen make a useful and large contribution to the national economy. I would cite just one figure: the value of the transport operations will amount to more than 45 million rubles.

CIVIL AVIATION

Air Force Transports Aid Civilian Sector

18290192 Moscow SOVETSKAYA ROSSIYA in Russian 30 May 89 Second Edition p 4

[Report by SOVETSKAYA ROSSIYA special correspondent N. Dombkovskiy: "Cherries Instead of Tanks"]

[Text] Burgas—Moscow—In the first year at the institute a quarter of a century ago, we asked a question of a well-known designer of military equipment:

"How will the cost of your product change if you erect two buildings with 60 apartments, a school and a hospital with your budget?"

The eminent scientist paused for a second, then he said:

"Not at all, generally speaking."

This is how I found out for the first time how much it costs to provide for the country's security. It is impossible to have even a rough idea of the astronomical resources that have been spent on military equipment over the past decades and how our standard of living would have been increased had these funds been invested in the national economy. But it was impossible to forgo defense capability during the "cold war" years. And only the new approach to international relations and the changed political climate in the world have made it possible to make use of some military equipment for civilian needs now. And military transport pilots of the USSR VVS [Air Forces] were one of the first to begin this work.

My associates in Aeroflot will forgive me, but a military transport aircraft differs from its civilian version roughly in the same way that a tank differs from a tractor. Everything seems to be the same—the engines, the wing, the similar fuselage. But the tasks and the conditions under which they have to be carried out are immeasurably more complicated. For this reason, VTA [military transport aviation] aircraft have been provided with the latest equipment for communications and navigation. Military pilots have been trained to fly under practically any weather conditions.

We were to make the so-called "fruit" run on the Moscow-Burgas-Moscow route with Lt Col Yuriy Bashashkin and his crew. The military transport pilots are increasing the number of flights each day, bringing fruits and vegetables from Bulgaria's new harvest. Each flight carries 30 tons of the produce. In the gardens in the morning and on the shop counters in the evening.

The sky was clear over Moscow, and the visibility was unlimited, as they say. But broken clouds appeared beneath us near Odessa and we got into dense fog on the approach to Burgas. And this is where I saw the military transport pilots in action.

The navigator, Maj Aleksey Bodryy, in whose cabin I had been given a seat, continuously calculated the coordinates and passed them to the pilots. And there on the second deck of the huge transport, in response to the navigator's commands, Lt Col Bashashkin and copilot Yuriy Utrobin brought the aircraft toward the ground. The rate of descent was 30 meters per second. As a comparison, if a stone is dropped from the 10th floor, which is 30 meters, it will reach the ground in 3 seconds! But here there are many dozens of tons of the most complex machinery which must be controlled faultlessly by reacting to changes in the situation in a fraction of a second...

However, Squadron Commander Yuriy Viktorovich Bashashkin is not unaccustomed to flights under instrument conditions. I recall his work in Armenia, where his crew delivered cargoes for the earthquake victims. He made impossible landings in Afghanistan, not long before the complete withdrawal of our temporary limited contingent. The other six members of the crew are a match for the commander.

Finally, our aircraft, made by the Academician G. V. Novozhilov KV [Design Bureau], came out of the clouds at a a very low altitude. On the right, the fairytale city of Nesebur flashed by, and the houses of Burgas appeared beneath us, then they were replaced by emerald fields with small islands of crimson poppies, and then the Il [Ilyushin aircraft] was rolling on the runway. Before we had taxied to the parking space, servicing vehicles were moving toward the aircraft and a nimble electric tractor was pulling carts with containers.

We chat with the commander during the unloading and loading.

"On one hand, I am very happy that I have had to work on such commercial flights, of course," Yuriy Viktorovich says. "We conduct training flights, train crews, and consume fuel just the same. And if we are now carrying hundreds of tons of vitamins without taking a ton of fuel from Aeroflot's supply, this is unquestionably a big help to the national economy. But on the other hand, as a military man, the organization of the work does not entirely suit me. Have you noticed? We were held up for an hour and a half before departing Moscow. And it is this way every day. The ground services are continuously late. As a result, the crews cannot rest as they should and the transport schedules are disrupted."

I cannot help but agree with Bashashkin. And this is confirmed by Aeroflot's representative in Burgas, N. P. Kholodov.

"There are more and more flights each day," Nikolay Petrovich said. "There is no question that it is hard to overrate the assistance of the military transport aircraft. Judge for yourselves: 100 tons of berries and fruits were flown from Burgas to the USSR in all of last year. But now the military transport aircraft have already carried 1,200 tons in two weeks! But after all, the season is just beginning. In my opinion, the customers have simply turned out to be unprepared to receive such a flow of cargo, believing that the work would be handled in the old way. Though things will sort themselves out gradually. But there are disruptions. And first of all we need to shift the air bridge to container transport. Only containers provide for the complete safety of the cargo and flight safety and they reduce the downtimes of equipment to a minimum."

Generally speaking, we need to point out that the civilian clients of military transport aviation will have to bear in mind that work with the military requires particular efficiency. Not only in delivering cargoes, but in ground services as well. The machine builders who made use of military aircraft the other day, for example, were able to organize their work so that the giant An-124's practically did not lose an hour. As a consequence, the customers made a saving in the lease and military transport aircraft operated in their usual routine.

Well, it is obvious that military transport aviation also must take the different conditions for equipment operation into account. As an example, there were difficulties with maintenance of the aircraft in Moscow.

In the evening, when we returned to Moscow, the aircraft began unloading practically at once. I do not know if this was because a correspondent from a central newspaper was on board or whether the customers had been able to put the airport-to-store production line in order. We hope it was the latter, especially as in the morning—I checked personally—fresh cherries from Bulgaria appeared in the capital's stores.

I would like to say one more thing. Commerce has rapidly found its bearings in Moscow and Leningrad—these cities are receiving fresh produce. But I think it would be useful in other populated areas in the Far North, the Urals, and the Far East as well.

Quieter, More Efficient Aircraft Engines Developed

18290189 Moscow SOTSIALISTICHESKAYA INDUSTRIYA in Russian 28 May 89 p 4

[Interview with V. Chuyko, deputy minister of the aviation industry, by V. Lagovskiy: "The Most Economical Ones"]

[Text] **Our country will show the latest models of aircraft engines at the 38th International Aerospace Exposition. V. Chuyko, deputy minister of the aviation industry, tells us about them.**

[Chuyko] Designs developed by several domestic enterprises will be displayed at the exposition. The PS-90A engines, manufactured by the Perm Motor Building KB [Design Bureau], have been earmarked for the modern Tu-204 and Il-96-300 airliners. The "Progress" Machine Building Design Bureau in Zaporozhye will show the D-436 engines for the Tu-334 and the An-74 polar aircraft and the DV-2 engines ("Dnepr-Vltava"), which were developed jointly with our Czechoslovak colleagues for a jet training aircraft. And finally, the RD-33 engines, which were developed by the Leningrad NPO [Scientific Production Association] imeni Klimov and the Moscow PO [Production Association] imeni Chernyshev for the MiG-29 fighter, will be displayed. In displaying these engines, we are acquainting specialists with the level of our technology and materials technology and with the sector's scientific potential, if you like. After all, we are counting on cooperation.

[Lagovskiy] It has been emphasized time and again that specialists have tried to give the current Soviet exposition a commercial accent. So is there hope that someone will be interested in our engines?

[Chuyko] And why not? They are in no way inferior to foreign models, and they are even superior to them in certain aspects. These are new-generation turbofan engines with a so-called high bypass ratio. The vanes of the compressor first stages, nearly a meter long, perform the role of unique propellers hidden in the casing.

[Lagovskiy] One of aviation's problems is the need to reduce the consumption of expensive fuel. In resolving it, Western firms developed this type of engine as long as 10 years ago. We are only beginning to switch over to more economical systems. Why have Soviet designers lagged behind so much?

[Chuyko] A fair reproach. Indeed, at the time that the Boeings were consuming about 28 grams of fuel per passenger-kilometer—there is such an indicator—our most popular aircraft, the Tu-154's, were consuming up to 40 grams. But it would not be correct to blame the designers for this. The new engines with a high bypass ratio (5) were tested as long ago as 1980—the D-36 for Yak-42 aircraft. In noise level, the content of toxic substances in exhaust gases, and economy, they met all international standards. In other words, we have not overlooked modern trends by any means. There were promising developments, but it is another matter that we did not succeed in putting them into practice. In those years priority was given to the defense programs—modernization of civil aviation was put in second place. All the same, the time was not lost to no purpose. The solutions found for military aircraft performed their positive role. We have been able to increase the gas temperature and the efficiency of many components. As a result, the Il-96-300 will now consume 23 grams of fuel per passenger-kilometer and the Tu-204 will consume 19 grams. The aircraft made by Western firms are not this economical yet. And now we must send the new aircraft out on Aeroflot routes more rapidly. After all, 15 out of every 100 passengers cannot fly at present. One of the reasons for the so-called unsatisfied demand is the fuel. Alas, there is not enough for everyone. Simple arithmetic shows that the new-generation turbofan engines will be kept within existing funds, even with a reserve.

[Lagovskiy] In outstripping the West in fuel consumption now, will we be able to maintain the gap in the future? After all, many firms are already developing more economical engines—fan-prop engines. It is possible that not only the designs for them, but experimental models as well, may be shown at an exhibition.

[Chuyko] Yes, propellers are returning. Their economy is well-known; in its time, our Tu-114 astonished many by flying to America on one fueling. The speed, noise level, and vibration were not suitable. Now, by providing the propellers with a large number of short blades, we can ensure comfort and increase speed roughly up to 850-900 kilometers per hour. The main objective now is to find the best possible shape for the blades. For this reason, we are not making a show of our models yet. But I will say that the engines already made in Zaporozhye are now undergoing tests on the Il-76 flying laboratory. The fuel consumption is 12 to 14 grams per passenger kilometer. Fan-prop engines of similar design, but with more power, are also being developed by the "Trud" Scientific Production Association in Kuybyshev.

[Lagovskiy] Viktor Mikhaylovich, readers often ask in their letters why our country does not conduct its own public shows. You will agree that by displaying up-to-date equipment only in the West, we are depriving Soviet specialists. After all, the representatives of many sectors certainly would like to acquaint themselves with innovations and to take advantage of the original designs and technological solutions found in manufacturing both military and civil aircraft. Perhaps it is worth reviving the celebrated public air shows, but on a different qualitative basis—aimed at introduction? Our newspaper is prepared to assume the role of organizer.

[Chuyko] I completely support this idea. I do not think that the recently formed All-Union Society of Aircraft Builders will remain on the sidelines, either.

An-24 Outfitted for Special Northern Area Transport

18290193 Moscow STROITELNAYA GAZETA in Russian 25 May 89 p 4

[Report by S. Shkayev, correspondent of the oblast newspaper VOLZHSKAYA KOMMUNA: "An Aborted Flight"]

[Text] **Kuybyshev—V. Ignatyev, candidate of physical and mathematical sciences, and his associates at the Kuybyshev Polytechnical Institute have undertaken a task of state importance: based on an An-24 aircraft that had completed its service life, they developed the "Sever"**

air-cushion vehicle. The Kuybyshev scientists' development could change the existing transportation system of the country's northern regions and solve a considerable number of social and economic problems. However, the fact that the testing period continues to be postponed and put off is not the scientists' fault...

"We are opposed to a wasteful attitude toward our national resources!" says Vladimir Vasilyevich Ignatyev. "The nature of the North is very vulnerable, but we must open up the tundra, and many departments are hiding behind this 'must' like a screen. But how thoughtless they are in their management! Tens of thousands of caterpillar-tracked vehicles are making furrows in the tundra and each one of them "plows up" up to 3 hectares of reindeer moss in a work day with its tracks. According to estimates by staff members of the Yamalskiy Experimental Agriculture Station, 6 million hectares of reindeer grazing land have already been destroyed in the Yamalo-Nenetsk Autonomous Okrug alone...

So just what are Ignatyev and his partners proposing? Using turboprop aircraft that have completed their service life in the sky as a form of transportation that is ecologically harmless. So that they can "fly" along the ground, they must be mounted on an air cushion. The "Sever" vehicle developed at the institute has a large number of advantages compared with other forms of transport. Even if only because hardware from the airframe and its power plant and navigation and other equipment are utilized in the design. Means of transportation weighing from 20 to 200 tons can be developed on the basis of converted aircraft (the An-12, An-24, and An-22). They can be used to carry passengers, cargoes with long dimensions, drilling and excavating equipment, fuels and lubricants, consumer goods, mail, and the like for a distance of up to 500 kilometers. It will fly over roadless areas, swamps, streams and ice at a speed of up to 150 kilometers per hour.

At first some economic managers considered the project to be fanciful. And this is why. The organization of series production of such vehicles is equivalent to the development of a new sector of industry and requires that the production of special rolled aluminum, equipment, and engines be increased. In a word, considerable expense. But Ignatyev believes that a new sector will not be needed at all: dozens of aircraft that are being written off will be used. Their use will make it possible to reduce the periods for developing documentation, decrease the cost, and ensure maintenance continuity. There is the opportunity to make use of the radio navigation aids for aircraft in the sparsely populated Arctic regions. Finally, money need not be spent on training cockpit personnel and engineering and technical personnel. New railroads and winter roads will not need to be built.

The spacious territories of the Far North, Siberia, and the marshy areas of the Far East, about 11 million square kilometers in area, can become the proving ground for use of the air-cushion vehicle. That is, 70 percent of the RSFSR. A mock-up of the craft has already been displayed at exhibitions in Leipzig, Brno, and Helsinki. The concept has aroused considerable interest from specialists. Incidentally, this is also because the Kuybyshev scientists' craft is roughly eight times more efficient than helicopters over short distances. It is dozens of times less expensive to develop a transport system than with traditional means of transportation.

In a word, the country needs such an air-cushion vehicle. As soon as information on its existence appeared in the press, V. Ignatyev was swamped with letters.

For example, the deputy general manager of the "Yakutalmaz" Association, R. Krasnoshtanov, writes: "Our association is experiencing many difficulties in delivering cargo to its facilities in the tundra zone of Western Yakutia. We think that the air-cushion vehicle will be able to resolve this problem. It is necessary to convert the old aircraft and even establish special subunits for cargo service..."

However, the Kuybyshev scientists have opponents who ask what they consider to be "important" questions. For example: "What will you do about the dust that the engines are certain to create?" Or, "Will the craft be able to fly over hills?" And it appears to some persons that the craft is not so ecologically clean or economically advantageous. Unfortunately, we have always had enough persons who like to clip the wings of ideas. It is good that the Siberian Department of the USSR Academy of Sciences is supporting the Kuybyshev scientists. In due course, V. Nakoryakov, corresponding member of the USSR Academy of Sciences, deputy chairman of the department, and coordinator of the "Transport in the Siberian North" program, appealed for assistance to the USSR Council of Ministers, requesting that the proposal be reviewed objectively and that funds be allocated to complete scientific research studies. Academician A. Trofimuk asked the State Committee for Science and Technology to allocate the resources. However, the state committee refused, referring to lack of interest by the USSR Ministry of Civil Aviation and Ministry of the Aviation Industry. V. Ignatyev, the supervisor of the studies, received a letter from the GKNT [State Committee for Science and Technology] which stated: "The committee supports the view that it is not advisable to allocate additional financial and material resources (as if they had already been allocated!) to conduct these studies."

Truly a strange decision! But after all, this does not involve a fundamental innovation—the scientists, disturbed by the departments' ecological plunder in the country's North, have not aimed at this, either. Why was it necessary for them to invent a new air-cushion vehicle if they can use an aircraft that has been written off and is either waiting for the "aircraft graveyard" or will remain parked permanently? But since the discussion has turned to innovation, I can say that Ignatyev and his colleagues have conducted aerodynamic research, they have

worked out the principles and technology for the conversion, they have defined the craft's hovering characteristics, and they have substantiated the economic calculations. Is this really minor?

But alas! The phrase, "does not contain new technical proposals," played its fateful role. And if someone else had been in V. Ignatyev's place, the matter would have faded away once and for all. But he and his associates are struggling to the end, and they consider the struggle their civic duty.

"Despite the bureaucratic obstacles," says Vladimir Vasilyevich, "we have made good headway..."

The scientists "shook out" an An-24 that had been written off, all the same. They brought it home under its own power from Kirovograd. The Kuybyshev Aircraft Plant is now providing considerable support for the institute's scientists. Its manager, Pavel Sergeyevich Tyukhtin, considers it his civic duty to help the scientists, by the way. For this reason, the enterprise is helping with metal and personnel, and is setting aside an area where the craft is being prepared for testing. The "Sever" vehicle is being developed by V. V. Ignatyev, two of his assistants, and several plant workers who want to help. The "Sever" is almost ready, but I, for example, in being aware of the group's difficulties, cannot understand one thing: how did they manage to do this under such unbelievable conditions?!

Inevitably, several questions are arising for the institute's scientists today. Let us assume that the craft is ready and has undergone testing. Who will be the customer of the new craft, and who will undertake its production? Won't the air-cushion vehicle remain the only one of its kind? And these are far from all the questions. The scientists believe that the time is ripe to take control of the write-off and disposal of aircraft that have completed their service life, and they must be utilized to produce means of transportation. Moreover, it is time to establish an engineering center under the institute to develop the vehicles. They need a proving ground on the Yamal Peninsula and a production base for assembly and maintenance. They need funds. That is, a state approach to the matter is required. No headway will be made in this problem with just the bare enthusiasm of several scientists. But they would like it to be!

MOTOR VEHICLES, HIGHWAYS

Military Equipment On Sale to Public, Enterprises

18010718 Minsk SOVETSKAYA BELORUSSIYA in Russian 9 May 89 p 2

[Unsigned article; 'From The Army Hangers'

[Text] The military-automotive equipment which, in connection with the reduction of the armed forces has been designated "for demobilization," has been moved out from army hangars directly onto the sales floor. At this unusual fair, conducted by the BSSR Republican Gosnab Commercial Center, powerful ZILs, URALs, KAMAZs, and GAZs which have done their service in the Belorussian Military District and in the GSFG can be obtained by co-op owners, renters and even private individuals. Two-hundred orders have already been received and not only for automobiles but also for clothing and other equipment.

For example, personal protection equipment is enjoying popularity especially among hunting and fishing enthusiasts.

RAIL SYSTEMS

Railroad Plant Suffers Metal Shortage Despite Prestigious Contract

18290190 Moscow SOTSIALISTICHESKAYA INDUSTRIYA in Russian 28 May 89 p 2

[Report by SOTSIALISTICHESKAYA INDUSTRIYA correspondent G. Dorofeyev: "Soviet Rails Under the English Channel"]

[Text] Stakhanov, Voroshilovgrad Oblast—**SOTSIALISTICHESKAYA INDUSTRIYA reported last week that the Stakhanov Railroad Car Manufacturing Plant won the competition for a prestigious order for the tunnel under the English Channel. The Soviet enterprise is providing "Eurotunnel" with metal support structures in an assembly with the rails.**

"Some 2,733 firms and enterprises, both in our country and abroad, competed for the right to get the order," says G. Kulganek, general manager of the Stakhanov Railroad Car Manufacturing PO [Production Association]. "They didn't even suggest that we take part. I learned about the order by accident, at the Mintyazhmash [Ministry of Heavy, Power, and Transport Machine Building] in Moscow. We decided to join the competition."

For a month the plant worked out a program to ensure product quality, and dozens of dies, assembly stands and jigs, and special measuring tools were designed and manufactured. Three specialized areas were organized and a shop for nonstandard equipment was set up. Workers were retrained.

The plant's readiness to fill the order was a surprise to representatives of the French firm that came to familiarize themselves with the enterprise. They distrustfully inspected test pieces and scrupulously watched production organization and quality control.

The customers also familiarized themselves with the plant's series production—the cars for transporting flour, polymers, and minerals and the all-purpose railroad cars that are as good as the best foreign models of this type. Obviously, this also played a deciding role in the signing of a contract for 180 million francs. The

delivery conditions were also discussed right here. The contract terms, let us say frankly, are strict. Deliveries strictly according to schedule only.

But the situation became complicated because the USSR Gossnab and the Mintyazhmash did not allocate 14,000 tons of rolled metal for the funds established. And the Gosplan, by not taking into account that the enterprise is shifting to the production of new types of railraod cars, had planned to increase their output by 30 percent!

However, the car builders were disturbed not so much by the strict contract terms as the attitude of the Gosplan and the Gossnab toward the enterprise. The plant management and the labor collective council went to the chairman of the USSR Council of Ministers, N. I. Ryzhkov. An order was given to the Gossnab and the Gosplan: "Allocate additional material resources in the second quarter of 1988 to the USSR Mintyazhmash through the Council of Ministers reserve in accordance with the supplement." Alas, the metal was allocated only for the fourth quarter. At that time G. Kulganek proceeded to establish direct contacts with the metallurgical combines.

The products from the Stakhanov plant were delivered in the exact period of time established. Under the heading "Soviet Rails to Build the Tunnel," the Calais newspaper wrote: "Certainly French ferrous metallurgy has been somehwat neglected by the construction project of the century. After some equipment for the tunnel was manufactured in the United States and Japan, 'Eurotunnel' ordered the rails and their supports in the Soviet Union. Some 925 tons of rails have been unloaded at the pier on the Loire."

"We interpreted this paragraph by French journalists as a distinctive congratulation on the successful beginning of collaboration," says G. Kulganek. "There is no question that we wanted to hear kind words from our higher comrades as well. But they weren't here. The Gossnab and Gosplan are continuing to tighten up, to put it mildly. The former is disrupting the deliveries of metal as before and does not want to reexamine the norms by taking the export order into account, and the latter is imposing plans without taking production capacities into consideration. Each day we have to explain or prove something..."

BAM Section Completion

18010654d Moscow KRASNAYA ZVEZDA in Russian 1 May 89 First Edition p 1

[Article by Maj. A. Vorobyev under the rubric "With the Same Concerns as the People": "From Zeysk to Tungala"]

[Text] **The military railway workers are to place this last, 156-kilometer complex of the Eastern Section of BAM into permanent operation in September of this year.**

The complex consists of three stations, six double-track sections and several settlements. The BAM workers are now engaged in building facilities exclusively for the normal needs of life: erecting apartment buildings, schools, kindergartens and public trade centers. Like all the Soviet people, the military railway workers are concerned about what will become of the railway. Will BAM turn out to be a "road to nowhere," as some journalists have stated?

I asked N. Isingarin, deputy USSR minister of railways, about this. This is what he had to say:

"I want to ease the minds of the transport construction workers. BAM was not a mistake, although many errors were made in its planning and construction. The main line still has prospects, however, it seems to me. This is confirmed by figures which we have. In just 8 years 200 million tons of freight and 22 million passengers have been hauled on the far from completed railroad. A total of 13,000 carloads of freight were hauled on the eastern branch of the route, which the military workers are in the process of building, during the first 4 months of this year alone. This is almost the amount hauled during all of last year!

The start-up of the main line for permanent operation will provide access to the treasures of an enormous region (just the adjacent zone totals 1.5 million square kilometers) and for transit to the Amur and Maritime areas and to Yakutia, shortening the route to these areas by hundreds of kilometers. In addition, the pressure on the overburdened Trans-Siberian Railway will be relieved, and an extremely short route will become available from Europe to Japan and back.

If the construction of BAM had been put off another 20 years or so and the railway had been placed into operation in the year 2010, let us say, the nation would have experienced increasingly frequent breakdowns, followed by the jamming, of the Trans-Siberian Railway, with all the consequences. (The traffic load here is already 2.3-fold greater than the average for the system, after all. It is time for the trains to be given the green light.)

In short, let there be no doubt that BAM is a road to the future.

Automation Role in Rail Transport Examined

18290182 Moscow ZHELEZNODOROZHNYY TRANSPORT in Russian No 3, Mar 89 pp 30-34

[Article by A.P. Pisarev, chief of the Planning-Design Technological Bureau of Automated Control Systems: "Perspectives for Automation of Online Transport Control"]

[Text] **Electronic computer equipment is being increasingly actively used for online transport control. An analysis of the results of creating automated control systems at**

various levels shows both the accomplishments and the disadvantages of these systems and makes it possible to determine the long-range directions of work in this field.

The systems developed and introduced (first ARM [automated work station], ASUSS, ASOUP [automated operations control system for production] and primarily the ADTsU MPS [automated dispatcher center control system of the Ministry of Railways]) for online control confirmed, on the whole, the correctness of the directions of automation chosen. In addition, the systems created made it possible to lay the foundation of an information base for online transport control.

At the same time, the existing systems were created at different times, as the necessary computer devices appeared. This led to the fact that each of them, while quite successfully solving the problem of automating the control functions at its own level, in practice did not meet the requirements of a unified technology for transport control. In addition, again because of the lack of necessary hardware, the systems were worked out in unnatural sequence—from top to bottom, and not the other way around, as should have been the case. Although the developers created a powerful network of systems interacting on the basis of an automated intercomputer information exchange (there are over 200 systems included in this network), it still does not provide the necessary technological interaction of the different control levels.

At present the prerequisites have been formed to create a unified integrated automated system for online control of operational work. Its basis should be a set of automated dispatcher centers to control the work done by stations, regions, railroads and the network as a whole. The technological and data base organization and support and the hardware and software of the integrated system ensure carrying out "through" (on the vertical and horizontal) technology for dispatcher control and solutions to all the necessary tasks of online control, as well as creating a system of electronic documentation of the transport processes, which specifies a uniform automated input of initial information to the computer network and gradual dying out of paper documents. A unified hardware configuration will be created, with stage transition from information to information-computer and computer networks, and program devices are worked out which will ensure "distributed" data processing and storage, functioning of the computer network in different modes, creation of a "knowledge base" and expert systems.

The Complete Automated System

In our opinion, the functional and technical structure of an integrated automated control system for operations should be examined separately. This will make it possible to organize the development correctly and achieve the necessary flexibility.

Solving the problem of efficient transport control is implemented on four levels—stations (DSP, DSTs), regions (divisions) of the road (DNTs, DNTsV, DNTsT), road administrations (DGP, DG) and the MPS [Ministry of Railways] (online-command equipment). The first two levels—station and division—are directly controlled by specific objects of the transport process (railroad car, train, locomotive, brigade). The third and fourth level make control decisions in relation to these objects only in individual cases. Their main purpose is to issue decisions according to the quantitative values, primarily of a regulative nature for trains, locomotives and cars.

It would appear that the main plan and special features of the functional structure of online control will be kept for a long time, which cannot be said of the technical structure. The special feature of the technical structure lies, in the first place, in the presence in it of one other level—the means of railroad automation (ETs and GATs at the stations, dispatcher centralization, dispatcher control and automatic block signal system on the sections). They are the sources of information on various events with mobile units (trains, locomotives and cars), which can be introduced into a computer network in the mode of the actual time of completing the events. The use of these data sharply increases the immediate nature of the information reaching the system and consequently, its effectiveness. We must remember, however, that information from the automation units should be "tied" to a specific object (number of the train, locomotive, car) and used in conjunction with data on the train consist, state of the car and locomotive, freight in the cars, locomotive brigades, etc. Therefore, machine models should combine extensive information on the object of control and information on the events coming from the automation devices. In the future, when achieving the necessary level of reliability for the means of automation and computer equipment, an automated control system of routes, switches, signals and locomotives should be created on commands from the computer.

The second special feature of the technical structure is the possibility of combining various functional levels when the necessary equipment appears and appropriate technological decisions and program devices are developed. The continuity of the functions realized and the stage nature of transition to new, improved decisions must be stipulated when developing the long range system. This is necessary in order to avoid interruptions in the operations, since instantaneous transitions to the new systems are impossible.

Substantial changes are taking place in all the functional levels of control. A full complement of ARM workers will be created at the stations, taking part in the transport work, and their interaction with the railroad automation units will be ensured. This approach makes it possible to form an online automated control system, new in principle, for the work of many stations. These systems should ensure integrating the automation of the online

control of the work of the station, and through modularity, have the possibility of assembling a set of software and hardware for station work that is varied in nature and volume (shunting, sectioning, freight, spacing, etc.).

Integrated automation of control processes specifies organizing the tracking of the mobile units (cars, locomotives) through taking information from the railroad automation devices (ETs of the stations, GATs, axle counters, devices for automatic recording of information from rolling stock, etc.), control of actuating processes (detaching cars from the hump, radio control of shunting locomotives, etc.), which are included in the subsystem of an automated process control system (ASUTP) and automate control of car flows passing through the station (preparation of documents for technical control, duty worker for the hump, shunting dispatcher working with consists of trains and cars during arrival, splitting up, programming, forming and dispatching trains, control of local work, providing information for workers in operations-dispatching and supervisory workers at the station, division and on the road, control of technological discipline, optimization, planning and predicting the work of the stations), and compiling the information planning subsystem (IPS). In addition, the system ensures interaction with the ASU [automated management system] (where there is one) of the locomotive and car depot and other railroad transport enterprises—freight consignors and consignees—and also with systems at a higher level—region or road.

The basic technical device for the information control system for shunting stations is a computer configuration organized on the principle of the local computer networks. The network serving the station should include: a processing and switching center based on a micro-computer type SM-1810 (for the largest stations the center can be created on the basis of a mini-computer type SM-1700); automated work places for the workers participating in ensuring the throughput of the car flows through the station (duty workers for the station, locomotive depot, PTO [technical inspection point] of cars and hump, shunting and station dispatchers, operators for the technical and commercial offices, chief of the station and his deputy, and others) on the basis of a micro-computer type SM-1804, a Robotron-1715, a YeS-1840 or similar equipment. When necessary, there should be added storages on the magnetic disk with varying capacity, color graphic video-terminals and other devices, microprocessor devices, ensuring interaction with the automated devices, automation of the executive processes, preparation and transfer to the processing center of information on the operations with the trains, cars and locomotives. These systems will have a very broad structural range—from one ARM of the duty worker to a division point, not fulfilling the freight work, to a large complex at a large sorting station.

The automated systems for control processes at all the separate points of the network are the basis for the transition to developing online automated control systems at the second functional level—the road division. It would be more precise to say—the level of the train dispatcher. It should be noted that the accumulated experience of concentrating dispatcher direction does not yet make it possible to establish an organizational structure (a unified dispatcher center for the road, a regional control center, division of the road) in which the train dispatchers will be located in the future. At the same time, their main function—direct control of the movement of the trains and locomotives on a certain section of the railroad—is retained in any case. Therefore, the creation of an automated system facilitating the work of the dispatcher and making it possible to best ensure the use of the throughput capacity of the section controlled by them is extremely necessary.

Work on this type of system is being carried out intensively abroad. Many countries (United States, Canada, the FRG, France, Japan, England, etc.) are creating various systems for automated tracking of the movement of trains and locomotives at the sections and stations, and are making a graph of the movements executed by the trains, a calculation of the predicted schedule and issuing recommendations to normalize the train situation. All of them are as a rule, however, uncoordinated and do not interact with the information systems, which does not give an integrated solution.

The VNIIZhT [All-Union Scientific Research Institute of Railroad Transport] is creating an integrated automated train movement control system (KSAUDP) with monitoring and processing on the section—Moscow-Aleksandrov Moscow Road. Scientists of the BelIIZhT [Belorussian Institute of Railroad Transport Engineers], in conjunction with the GTSS, the Donetsk road and other organizations, are working on the creation of a unified road control center. New systems, based on microprocessing equipment, are being worked out for dispatcher centralization.

These systems, just as in other countries, as a fundamental information source, use railroad automation devices (dispatcher centralization, dispatcher control. automated block signal systems, electric centralization, etc.), supplemented by special devices to link up with the computer equipment, and a large number of various types of pickups and monitors. The existing level of reliability of these devices, their cost, material-intensiveness and labor-intensiveness of realization make the possibility of widescale introduction of such systems in short periods dubious. At the same time, the appearance of relatively inexpensive personal microcomputers and the possibility of creating on their basis, with the use of other computer equipment devices, regional computer-information networks gives a cheaper and simpler way to solve the problem.

The Personal Electronic Computer Is in Control

At the present time, some sections of the Donetsk Railroad are testing the first experimental system for controlling the train situation based on a personal computer, which was developed by the workers of the PKTB

[planning-design technological bureau] of the ASUZhT [railroad transport automated control system], newly created by the All-Union Scientific Research and Planning Design Institute of Means of Automation for Railroad Transport (VNIIZhA] and the Donetsk Railroad. The system provides information for the train dispatchers and duty workers for the stations on approach of trains to the areas, sections and stations, fixing the operations with the trains, locomotives and locomotive brigades, accumulating this information and issuing it in the form of a log for the movement of the trains and locomotives (forms DU-3, 3A, 2). It is also specified that the information reflect the models of the electronic network for the computers of the train position at the stations, sections, control areas, calculate the results of the work for the periods and dispatcher shifts, and automate obtaining and fixing the information necessary for the train dispatchers, duty workers for the stations and other operating personnel, as well as other routine work (for example, transmitting and recording the dispatcher orders). It sharply reduces the need for traditional telephone negotiations for the duty workers for stations with a train dispatcher.

The control system for the train position at the stations and sections based on personal computers specifies the creation of automated work places for the duty workers for the stations and train dispatchers, who are joined into the network and work in conjunction with the railroad system of online transport control. The computer-information network of the system has a decentralized structure and is built on the territorial-hierarchical principle. It consists of many interacting computers. The network carries out "vertical" information flows between the personal computers and computer centers of the regions and roads, as well as "horizontal"—between the personal computers of the neighboring stations.

The work places of the duty workers for the station and the train dispatchers are equipped with personal computers with alpha-numeric, and for the train dispatcher color, graphic displays, small printers, keyboards and linking equipment for joining into the network. These computers require no more than 1 square meter of area and need no special climatic conditions or constant service.

For each track of the station the screen issues full information on the train, including the number, index, time of arrival, dispatch (passage) and other characteristics, weight, length and additional features on the conditions of accepting (passing) the trains. The computer stores in its memory information on the locomotive, brigade, train consist and other data, which when necessary can be displayed on the screen for examination and change.

The computer stores analogous information on each train "on approach" in its memory, and the screen displays the number of the trains at each direction of approach, put in order of its time of departure from the neighboring station, as well as the necessary information to organize the acceptance (throughput) of the trains (weight, length, bulkiness, discharge freight, etc.). When the train is accepted, the duty worker instructs the computer as to which train is arriving from the "approach" and on what track. The computer fills up the appropriate line of the screen in the section "Position at the station" with data on the approach.

The network carries out a very important ASU principle: one-time input and subsequent multiple use of the information. This is the main factor in freeing the operations workers from routine worries. For example, information on the consist of the formed train enters the network. In the process of the train's movement, data on it will be transmitted in advance to the computers of the station of passage or arrival. The duty worker for the station uses this information when accepting the train and records, by means of the computer's keyboard and screen, the operations with the train, which are being carried out at the station. After the departure of the train the computer itself transmits the necessary information through the network to the next station. Thus the cycle of use of these data will be repeated at all the stations, until the train is split up at the final station.

Under these conditions the duty worker for the station does not have to make notes in a table log. The necessary control information is offered to him on the screen, and the log on arrival and departure is automatically made in the computer's memory. Upon the demand of the duty worker it is issued on the computer screen or in print for any period of time, and at the end of the shift—for the entire work period. It is specified that variants of the log be carried out on forms DU-3, DU-3A and DU-2. The software creates the necessary convenience for work with the computer with a minimum amount of key depression of the keyboard. The total volume of information fed into the computer is considerably less than that for filling in the log "manually."

All of this creates the necessary conditions for transmitting data to the train dispatchers through the computer-information network. As the trains move through the stations, the information on their operations, automatically transmitted by the computer to the communications channel, arrives at the computer of the information-control system for the region. The road system transmits data on the train consists, the locomotives, and the locomotive brigades to the computer of the region's information-control system as well. It makes a detailed dynamic model of each section, precisely reflecting the dislocation of the trains to the yard and track at separate points and sections between them, the time and form of the latest operation with each train, their consist with a detailed breakdown by types of rolling stock, loaded and empty, local freight, special rolling stock, special throughput conditions, etc.

On the basis of dynamic models and other types of data, the information-control system provides the ARM DSP with information on the consists of newly formed trains

and the ARM DNTs on all the operations dealing with the movement of trains, locomotive brigades, the approach of trains and other events. It transmits the information on its operations with trains for the assigned stations in the road system, accumulates it for the tabular form of the schedule of movement executed, prepares data to plot the graph of the movement fulfilled on the graph plotter, calculates the indicators of the work of the sections and region as a whole for the shift and the 24-hour period, and solves the problems of planning and predicting the work of the stations, sections and region of control as a whole.

The ARM of train dispatchers at the first stage is created on the basis of a YeS-1840 personal computer. On the basis of its potentials, the train dispatcher obtains information on the operations with the trains at the stations in his section, on the basis of which he fills in the graph of movement executed. This eliminates the need for the dispatchers to talk with the duty workers for the stations. A color graphic display is added to the YeS-1840 computer, on which fragments of the graph executed for movement of the trains are issued. The screen of the color graphic display can depict the schedule of the movement executed in the past 1.5-2 hours and plot a predictive graph for 2-3 hours ahead. This makes it possible to ascertain possible difficulties in the organization of the train work in advance and outline more efficient measures to avoid them.

The train dispatcher can ask for any information from the information-control system of the region, road or other systems operating in conjunction. The road system, obtaining prompt and high-quality information on the operations with the trains, and "approximating" the actual time, acquires the possibility, at a higher level, of solving the problems of planning the train operations of the road, organizing the use of locomotives and providing the ADTsU of the Ministry of Railways and the management of the road with information.

It is planned to supplement the system with devices for collective display of information. It is primarily a question of a display board for collective use, on which, at the desire of the workers of the control center or the directors, information can be presented on the position of the stations, the approach of trains, the presence of empty cars, local cars, locomotives, brigade work conditions, etc. In addition, graph plotters are specified for the system, by means of which, on the basis of information stored on the train operations, any fragment of the graph of the train movement executed can be plotted. With the presence of color graphic displays, on which an efficient graph of each section can be depicted, and the information on it recorded on the computer for calculation and analysis of all the indicators, it is inexpedient to draw the graph of the movement executed fully for each section. The only fragments of it required are those for which any conflict situation must be investigated. This approach creates true prerequisites for realizing the automated control center systems for the operational work of the regions of the network. Moreover, these regions can be varied in size.

The first experiment in creating a prototype of a regional control system on the Donetsk road confirmed the need for it to contain its own computer complex. There are a number of reasons for this. Among them should be mentioned, particularly, the considerable load on the road system computers. Including regional networks in them causes a sharp increase in the flow of input and output information. In addition, the concentration of the computer complex considerably reduces the reliability of the entire control system, and increasing it through duplication requires considerable capital investments. Indeed, the number of control regions will be considerably greater than the roads today, and accordingly, than the road information computer centers. Servicing remote regions with a single computer information center requires a large number of communication channels, which also increases the capital-intensiveness of the system and prolongs the period for its realization.

Promising Directions for Work

Creating regional ADTsU systems does not replace the road system with respect to functions, but will contribute to reducing its load of primary information processing, issuing information to the users of lower levels and, as a result, to the release of computer resources to solve the problems of predicting, planning and optimizing the transport operations of the entire road.

Therefore, there are two promising directions of work for development of efficient control systems:

Working out technology for individual workers and subdivisions, making broad use of the potentials of the systems that have been worked out and are being developed, thus eliminating parallel flows of information, giving legal force to all the documents issued by the system and the obligation of using in the work only documents obtained from the computer at all levels of control and by all workers;

Working out, testing and carrying out "through" technology for all the basic directions of efficient control of transport at all levels (freight operations, throughput of train flows, distribution of car fleets, operation of locomotives, etc.), a methodology of predicting an operational situation and its individual elements, issuing regulatory measures to prevent serious difficulties from arising, planning the basic indicators of the operational work and their optimization.

Carrying out the first direction requires painstaking and daily work by scientists, developers and operations workers to create, test and disseminate the new technology and to study the practical experience of the roads and "duplicate its software for distribution". The main

attention in this work should be concentrated on solving the problems of making the control processes economical, and on working out resource-saving technology, ensuring economy of both technical and human resources. Technology is needed that makes it possible to work successfully under the conditions of full cost accounting and self-financing, to which all the roads and enterprises are being converted.

At a number of roads, individual solutions were found which, for simplicity of realization, yield considerable economic results. For example, on the Northern road all the trains formed at stations having telegraph communication with ASOUP are dispatched only with train consists issued by the computer. This solution makes it possible to ensure the promptness, reliability and fullness of the information on the train consists and on their formation, and makes it possible for the train dispatchers, who have received the information on the train's readiness for departure, to organize its departure and throughput for the section correctly.

The Odessa road found an interesting solution. Here they introduced, as an obligatory supplement to the route of the locomotive engineer, information on the consist of the train, specially oriented toward the fulfillment of the route by the locomotive engineer. As a result, through the more accurate information, the gap between the chargeable and operating ton-kilometers was considerably reduced (up to 4 percent). The economic effect of just this one measure is determined as several hundred thousand rubles.

These examples show the sizable potential of the existing systems. Moreover, it considerably increases when the necessary level of completeness and reliability of information is achieved. This is shown most graphically in the solution to the problems of a so-called through nature. For example, right now all the systems are checking trains for the conformance to the plan of the formation for weight and length norms. Each of them, however, solves the problem independently, even though they all operate according to approximately the same technology—verification upon arrival or make-up of the train consist, report to the subscriber on the violations detected and accumulating and issuing the total information for a certain period to the workers in charge of these problems. It is as if the control were continuous and a huge number of trains were proceeding with violations.

On the one hand, the fault here lies with the responsible workers, who have decided not to legalize the prohibition against issuing a car list from the computer when there are violations (naturally, if the departure of the train is legalized only with the car list, as on the Northern road), but on the other hand—it is important to build a technology so that there are no superfluous checks and the system prevents overloading the shunting yards with additional shunting work.

Work should be accelerated to create and develop a "Road Dispatcher" system, primarily to control train flows, organize the formation of trains for destinations at a greater distance, etc. Along with the development and realization of individual methods of predicting and planning individual elements of the operations work, serious work must be done on devices, new in principle, for solving the problems of online control. It is a question of the need to work out fast-acting simulation models and create, on their basis, dialog systems of planning and optimizing individual values (loading specific types of freight, the need for locomotives, etc.).

Creating models and dialog systems of this type will make it possible to make the transition to the development of a "base of knowledge" and expert systems. The essence of using these new devices may be shown in a specific example. Let us assume that when planning the loading of coal the road administration reveals a shortage of resources of gondola cars to fulfill the assignment. Naturally, in this situation a decision must be made that will give the maximum loading. The worker of the road's operations-command division heading the planning should have a sufficiently powerful personal microcomputer linked to the computer of the road system. On the command to the personal computer, the knowledge base is "transferred" to organize the distribution of gondolas and the initial (or predicted) situation of the loading resources of gondolas in the polygon.

The recorded decisions made earlier and the results of the work done according to them (both negative and positive) are stored in the knowledge base. By using these bases, devices of the simulation model and initial situation, the planning worker "reports the execution" to the personal computer of several variants of the distribution of gondolas and evaluates the results. After the desired one is chosen, it is altered to the plan. If it has insufficient computer capacity, the personal computer should be provided with the possibility of the work of a simulation model using the computer of the road information computer center. After selecting the variant, the data for it and all the other "checked" variants are processed and recorded in the memory base. This technology makes it possible to accumulate a data bank more quickly and to make it more flexible when checking the variants in the future. It should take one to two minutes to calculate a single variant on a simulation model with a memory base.

At the same time, development of new methods and means of efficient work control requires new solutions for the structure of the control. Of the four functional levels discussed above for efficient transport control, the first and fourth have the most finished form and clearly expressed independence. However, the second and third level can be realized on unified technical devices with a unified territorial arrangement of workers implementing the functions of these levels. Experience in carrying this out is presently being accumulated on the Donetsk road and being theoretically confirmed in the work of scientists of the BelIIZhT.

The transition to the new control structure requires solving many organizational, technical and technological problems. These are determining the optimum number of control regions, creating a network of regional automated dispatcher control centers, a new system of documenting transport and principles of working with the information, and interrelations of man with computer and between the control levels. In our opinion, there is now enough experience and definite work in progress to solve these complex and large problems.

On the basis of the developments of the VNIIZhT it is recommended that about 40-45 regional transport control centers be set up. The roads propose considerably more. The boundaries of the regions should be determined on the basis of the technological completeness of the region for organization of local work, car- and train flows, operation of locomotives and locomotive brigades. The regions should be similar in adjusted aggregate intensiveness of operations work. It must be noted that the recently issued instructions of the Ministry of Railways on creating automated control centers on the roads do not contain a clear-cut determination of how many of these centers there will be on the road. It is specified that two-three ADTsU apiece be organized on a number of mainlines. It is not clear just how, under these conditions, work will be distributed among the regional and road centers.

The information and technological base of the future system of online transport control can be the system of document circulation, and work technology developed at the MIIT [Moscow Institute of Railroad Transport Engineers] under the direction of Professor L.P. Tulupov. The experience in designing ASOUP, ASUSS, ADTsU MPS, ARM and other systems, accumulated by PKTB [planning and design technological bureaus], ASUZhT [automated railroad transport control systems], VNIIZhT [All-Union Scientific Research Institute of Railroad Transport], GTSS, VUZes, GVTs [main computer centers] of the MPS and road IVTs [information computer centers] makes it possible to do research and planning work to determine the hardware configuration for all levels of control. This work should be based on the need, along with the functions of the software, for all the workers and levels of management to solve, practically at each work place and at each level, the tasks of predicting a situation, working out efficient work plans and regulative measures to prevent breakdown situations and optimizing elements of the transport process.

There must be immediate stipulation of organization and priority in the developments fulfilled at the present time. The leading specialists of VNIIZhT, VNIIZhA, PKTB ASUZhT, GVTs MPS, MIIT and other organizations should be concentrated in a unified creative collective as the basis of the new work organization. Its task should be the development, in the shortest periods (1989) of integrated technology for online transport control at all levels, based on an automated dispatcher control center system and "through" technology for solving the main problems.

In addition, the task of the collective should be to work out the requirements for distributing the control functions among the levels, under the conditions of their integrated interaction for the purpose of optimizing centralization of online control, as well as the basic requirements for all the divisions of the system (information, program, technical, legal and other types) and at all levels. The main efforts of the developers must be directed primarily toward developing regional systems (in view of the small stockpile of work on it) and automating the work of line enterprises (in consideration of the great variety of ARM developments and their equipment with a large number of stations and other railroad transport enterprises differing in the nature of their work). Clear-cut organization of the work and assignment of a sufficient number of developers will make it possible as early as 1990 to start on processing individual elements of the system at the main objects, and in the 13th Five-Year Plan to ensure their broad duplication in the network.

The effectiveness of an integrated system is undoubtedly high. It is achieved through a considerable reduction in manual labor when preparing the primary documents, information on them and on the operations with the trains and locomotives and automation of its transfer between levels and systems. A considerable effect should be achieved through efficient solutions, and in the latter, of the optimization of transport work, through carrying out "through" technology and the newest achievements of science and computer equipment.

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