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USSR Report

ENERGY

No. 136

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GENERAL

COMPRESSOR STATIONS

PROGRESS ON COMPRESSOR PLANT CONSTRUCTION DESCRIBED

Leningrad LENINGRADSKAYA PRAVDA in Russian 2 Oct 82 p 2

[Article by A. Soboleva: "Hot Kilometers"]

> [Text] It is written in the commitments of the collective from the association "Nevskiy Zavod" imeni F. I. Lenin: "Organize series manufacture of 25 kW gas pumping units designed for large volume transport of Tyumen' gas to the central regions of the country and abroad.
>
> The importance of the set task is well understood not only by the Leningrad machine builders, but also the subdivisions of trust No 39 of Glavzapstroy, its subcontracting organizations which are involved in building frame No 7 of the high-rotating compressor machines and the 8-kilometer gas pipeline. This will supply gas to the test bench of the GTN-25 series turbines. The plant workers and the builders together are now solving an important task set by the 26th Party Congress.

Two construction sites, two start-up complexes, the shop of compressor machines and the gas pipeline with test bench for the GTN-25--the plant has stipulated their start-up in the fourth quarter of this year. But, understanding the special importance of the work to be done, sensitive to the attention and help given to the collective by the party obkom, the construction participants have concluded a contract for creative cooperation and have decided to fulfill the assignment ahead of schedule: to finish the shop by 1 December, and the gas pipeline in October. How is this being accomplished?

We asked this question of a customer, the main engineer of the Administration of Capital Construction of the Association, L. G. Vanag, and the deputy head of the general contracting trust No 39 R. N. Smirnov. These were the answers: "The word of the builders is in keeping with their work," "The customer provides timely and business-like assistance in everything."

Quite unexpectedly, L. G. Vanag distributed the duties thus: she will discuss construction of the shop, and Smirnov the gas pipeline. We have

become accustomed to the fact that the customer representative gives an interview on somewhat different questions, say, ones associated with documents, equipment, or evaluates the work of the builders as a whole. Here, it was otherwise... However, Smirnov listened to Lyudmila Grigor'yevna's story about the work experience of her subdivision with clear interest.

"The first phase platform of shop No 7 is 20,000 square meters. Here we were faced with building blocks No 1 and 2, and 10 foundations for equipment and machines. The main difficulty for the builders was in that the facility had to be erected where active shops and warehouses were located. The brigades started and the plant literally was removed from its long-occupied site. It was quite an endeavor for the workers: the old foundations interfered with driving of the pilings and they had to be taken apart. This required a lot of time and effort!

But the more difficult the shifts were, the more organization, harmony and conscientiousness the people demonstrated. It would seem that the work day was filled to the end, and that an enormous load lay on each member of the brigade. Suddenly the slogan-appeal appeared next to the worksite of the brigade of Ravil' Shiriyazdanov: "Fulfill the assignment for 5 days in 4!"

Construction work on the equipment foundations went considerably faster. Now 6 out of the 10 are ready, and the installers of the trust "Soyuzprombummontazh" have started to assemble the "Shenk" machine ahead of schedule. The initiative of the colleagues to work with the highest labor productivity has been supported by the masons of A. Eller, the installers of Yu. Kurnikov, the roofers of S. Konakov, and the subcontractors from the trusts No 45 and "Sevzapstal'konstruktsiya."

The time saved by the brigades due to the precise organization of labor has been demonstrated in additional cubic meters of laid concrete, square meters of brickwork and tons of installed metal structural parts.

In assembling the foundations, instead of the standard concrete forms, large-sized concrete partitions were used. They guaranteed reliability and efficiency of the structures, reduced the labor outlays, and made it possible to conserve a large quantity of lumber. Schedules for brigade shifts were developed and strictly observed. The site received powerful equipment, in particular, the high-duty concrete pumps used here for the first time.

The plant workers and builders worked under the motto: "From mutual claims to mutual help!" If the construction site needed people to help, they were assigned to work the ground and do clean up operations. If early shipment of installation cranes was required--they were shipped to the construciton site not in the third quarter as planned by the schedule, but in the second.

If the builders suggested there was a need to change the technical documentation, they were rapidly linked to the planners and resolved all the issues together in the shortest time possible. Constant technical inspection

of the site was organized--this helped to solve a lot of questions on the spot. The general constractor, after setting up close contact with the subcontractors became the main director of the construction site.

The shop is now completing removal of ground for preparation of subfloors, and completing construction of the 7th foundation. We have no doubt that in November shop No 7 will be completed considerably ahead of schedule.

The deputy head of trust No 39 R. N. Smirnov was given his turn:

"The gas pipeline is the main artery in which gas will travel to the plant shop to the special work bench where the main machine GTN-25 will be tested.

One can say now that our route has passed from the gas distributing station "Vostochnaya" to the shop plant in a record short time, in 4 months.

It was made over swamps and under the active trunklines at a depth to 4 meters. It crossed railroads without stripping the asphalt. It was pulled by special winches under city avenues and streets, and passed via 2 inverted siphons through the Neva. The work was done by the best brigades from the "Lengazteplostroy," "Lengazspetsstroy," "Spetstonnel'stroy," and "Podvodrechstroy" trusts. Representatives of 20 city organizations, gas workers, telephone operators, and electricians held a 24-hour watch on the route: they provided "goodwill" for the operation.

The general contracting administration No 94 of our trust was given the duty to coordinate the actions of all the participants of the gas pipeline construction. The instituted council of specialists of the administration under the supervision of the main engineer V.P. Agafonov did a lot in order to guarantee highly productive work of each brigade involved at the route. As a result, testing of the gas pipeline for strength was started 5 days ahead of schedule. This is a new and important stage in the work of the construction site collective.

Two pipelines are being flushed at the second kilometer by the brigade of I. F. Blinov from the trust "Lengazspetsstory." The operations which normally require 3 shifts have to be done in one: the commission that will formally accept this route segment has been set for the morning.

The tests were going well, and only 30 minutes remained until the end of the shift when suddenly an influx of water occurred. Everything had to be started from the beginning.

The brigade of communist I. F. Blinov remained at the route in order to present the section to the specialist at the precisely established time. Blinov said nothing about the accident or the troubled night shift. He simply said about what had happened: "Everything was done that we could. The second kilometer of the route was tested and is ready for work, this is what's important."

Yet another happy event occurred in these prestart-up days: the inverted siphon was connected through the Neva to the gas pipeline, and testing of the pipeline traveling from the right shore of the Neva to the plant was started. Four more kilometers of the route remain tha verification exam.

I am confident that it will be finished successfully, both here and at the construction of shop No 7. It cannot be any other way when we are concerned with fulfillment of the important party assignment, which as recently noted at the open party meeting of the association "Nevskiy zavod" imeni V. I. Lenin, has become the business of all the people of Leningrad.

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CSO: 1822/33

ENERGY CONSERVATION

ROLE OF ELECTRIFICATION IN ENERGY CONSERVATION EXAMINED

Moscow IZVESTIYA AKADEMII NAUK SSSR, SERIYA EKONOMICHESKAYA in Russian No 4, 1982

[Article by Yu. M. Kogan]

[Text] Basic ways to conserve energy and the role of electrification in solving this task are examined. Conditions and efficiency of using electricity in order to displace high-quality fuel in different sectors of the national economy are indicated.

The 26th CPSU Congress named the transfer of the USSR national economy to a resource-conserving path of development as the most important trend for improving the efficiency of social production. The tasks in this area were made more specific in the decree of the CPSU Central Committee and the USSR Council of Ministers published on 4 July 1981: " Intensifying Work for Conservation and Efficient Use of Raw Material, Fuel-Energy and Other Material Resources," and in the documents of the November (1981) CPSU Central Committee Plenum. Especial importance is attached to energy conservation. Its increasing role is determined by a set of objective factors, among which we should name:

Continuing stable rise in the volumes of social production and increase following from here in the quantity of energy consumed by the national economy;

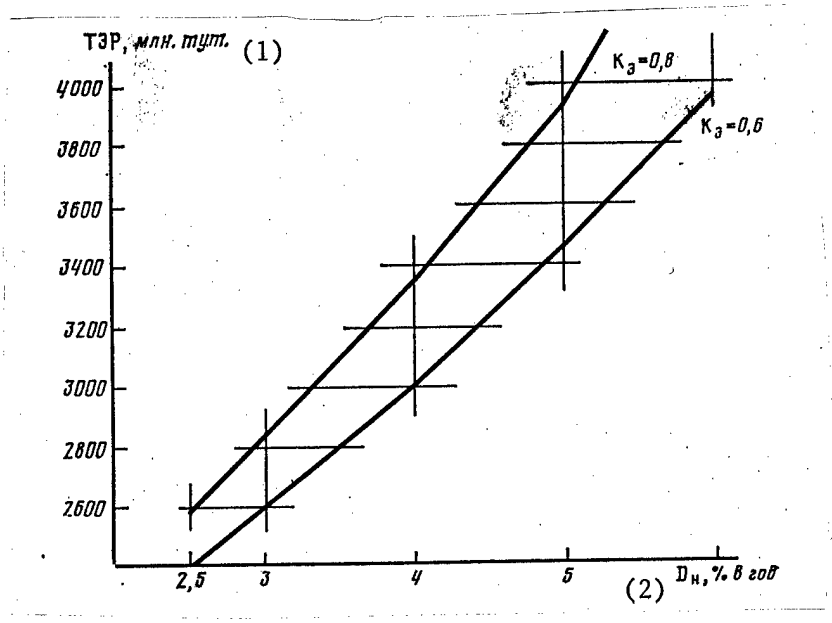
Nonrenewable nature of organic fuel which now comprises 97 percent of the USSR fuel and energy balance and will still play the dominant role in it for a long time;

Relatively limited potentialities for growth in extraction, and increasing cost of high-quality primary energy resources, primarily oil;

Intensification of environmental pollution by the fuel and energy complex, induced by rise in volumes of production and energy consumption.

In 1980, production of primary fuel and energy resources in the USSR was 1.928 billion T of conventional fuel, and their consumption was about 1.677 billion T of conventional fuel, or 3.7 T of conventional fuel for R 1 of the national income. In this case in the 1970-1980 period, for a 1 percent rise in the country's national income, on the average for the year there was a rise in production of fuel and energy resources of about 0.9-1.0 percent,

and rise in their consumption of over 0.8 percent. It is technically possible to bring the ratio of annual rates of rise in consumption of fuel and energy resources to the rate of rise in national income to 0.6-0.7. This would permit a significant reduction in the future in the scales of energy use in the country. A gradual decrease in the coefficient of elasticity from 0.8 to 0.6 by the year 2000 would provide a saving equal to 23-25 percent of the total increase in annual energy consumption in the country in 20 years (figure 1).



Consumption of Fuel and Energy Resources (FER) in the USSR in the Year 2000 Depending on the Rates of Growth in National Income (I)and the Coefficient of Elasticity of Growth Rates in Consumption of Fuel and Energy Resources Depending on the Growth Rates of I. Key 1. FER, Million T of Conventional Fuel 2. I, Percent Per Year

Conservation of energy must be viewed together with conservation of all production resources. A certain preference is possible in the conservation of certain resources from the view point of productivity of social labor as a whole. This preference is determined by the deficit of individual types of resources, the possibility of renewing them and reproducing them, and in the final analysis, the relative effectiveness of producing and using them. Increased consumption of some resources can be justified by the conservation of others.

Measures for energy conservation generally should implemented if outlays for their conservation are lower than the outlays for extraction and reprocessing of energy resources, until the stage at which these measures are taken. Technical and economic conditions for energy conservation change. However, the potentialities for conserving energy are so significant that they make it possible to view the energy-conserving policy today as a long-term trend in the development of the fuel and energy complex. In a combination with further increase in the country's energy potential, energy conservation has been called upon to guarantee optimal proportions between the development of power engineering and the national economy as a whole, and consequently,

to create conditions for reliable and effective energy supply for economic growth. The national economic plan for the 11th Five-Year Plan outlined in 1985 a saving of fuel and energy resources as compared to 1980 of 200 million T of conventional fuel, of them no less than 70-80 million T of conventional fuel (a quantity equal to the current annual increase in consumption of fuel and energy (through reduction in the consumption standards, i.e., by direct measures for absolute conservation of resources not including replacement of organic fuel with nuclear energy and hydraulic power.

The trends and scales of energy conservation are determined from an analysis of two basic factors: structures of consumption and losses of fuel and energy resources by sector of the economy and stages of energy use; technical potentialities and economic indicators of energy conservation.

The coefficient of utility of fuel and energy in the USSR, according to our estimates, is currently about 38 percent, i.e., of the 1.677 billion T of conventional fuel used in 1981, about 630 million T of conventional fuel were used effectively.

The modern structure of energy losses is presented below, %

Total losses	100
Of these:	
Losses during extraction, transporting, reprocessing and transforming of resources	35
Including at power plants	19
Losses at final consumers	65

About one-third of all the losses are losses for extraction, concentration, transporting and transformation of energy resources, including losses during transformation of organic and nuclear fuel into electricity and heat at power plants. One-fifth goes for the electricity industry. A large part, about two-thirds, is losses of energy resources for the consumer link of the fuel and energy complex. This indicates the primary importance of conducting an energy conserving policy among the consumers. The features of losses during energy consumption are that they are associated with the technical level of production, and they differ depending on the technologies.

Great differences in the possible scales and efficiency of energy conservation according to trends of conservation and sectors of the national economy follow from here.

The first trend of energy conservation is to improve methods and enhance organization of calculation and monitoring of energy use. This trend is oriented on eliminating inefficient fuel consumption within the existing technical level of its use. It is associated with relatively small outlays. It only requires installation of instruments for calculating and monitoring energy consumption, and therefore is especially highly effective (see Figure 2). It is obvious that this trend can be realized primarily in the sector of centralized fuel and energy use, i.e., mass consumers of final energy, including production of heat in small boilers.[1]

[1] At the same time, organization of calculation and monitoring energy consumption is a necessary prerequisite for implementing the program of energy conservation in other important trends.

The second trend assumes increase in efficiency of units for transformation and final use of energy by improving the designs of the energy-consuming equipment, including apparatus for use of side energy resources. The USSR has currently developed a system of standards for fuel and energy consumption which bans the manufacture of equipment which does not guarantee the standard efficiency. Replacement of outdated and worn-out equipment at power plant, and further centralization of heat supply, for example, are significant in this area.

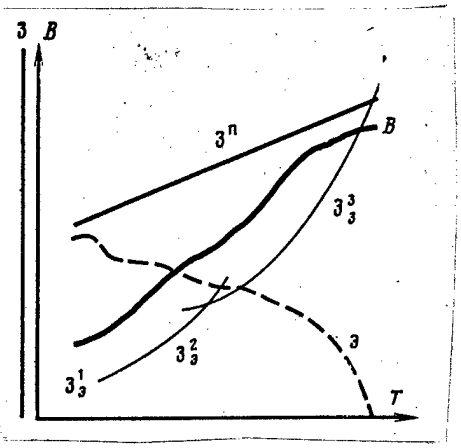


Figure 2. Dynamics of Outlays (З) for Production and Conservation of Fuel and Energy Resources in Time (T) (simplified plan) Key $З_п$. Specific Outlays for Production of Fuel and Energy Resources
$З_э$ Specific Outlays for Conservation of Fuel and Energy Resources:
$З^1_э$. Organizational Stage (Calculation, Monitoring) Organizational-Technical Stage Associated with Rise in Efficiency of Equipment
$З^3_э$. Structural-Technological Stage Associated with Decrease in Consumption of Useful Energy
Э. Specific Effect of Conservation of Fuel and Energy Resources ($Э = З_п - З_э$); B--Quantity of Conserved Fuel (Integrated Curve)

In order to save high-grade fuel it is important to develop a centralized heat supply based on the use of nuclear energy, ATETs and nuclear heat supply plants (nuclear boilers). There is still a considerable number of condensation heat units in electrical engineering with initial steam pressure 90 absolute atmosphere and lower. The replacement of only one-third of this equipment with modern equipment would conserve fuel and energy resources totalling 8 million T of conventional fuel per year. A total of 250,000 small and tiny boilers are operating in the heat industry of the country. They produce about half of all the heat of average and low potential consumed in the country. The problem of replacing these boilers with centralized sources, of course, cannot be solved completely, especially for the scattered consumers in the rural localities and in cities with low buildings. However, a considerable number of these boilers can be replaced by larger ones, and in the others, the units can be updated or replaced by equipment of the same power, but technically more advanced, in particular by providing automation of fuel supply and fuel combustion regimes. According to the available estimates, the potentialities for conserving fuel here are 30-50 million T of conventional fuel [3].

The level of use of by-product (secondary) energy resources remains low at many enterprises. It is necessary to force manufacture of boiler-recovery units, heat-exchangers and other recovery equipment, and to improve their operating characteristics. Calculations indicate that one can save here about 30 million T of conventional fuel a year. A special type of use of secondary resources is recovery of the emitted low-temperature heat: ventilation emissions, power plant condensate, etc. The main consumers of this heat could be greenhouses and heat pumps which transform this energy for heating needs, etc.

Measures to conserve energy in this trend have been technologically available for the most part, and their implementation does not involve any basic technical or organizational difficulties. Conservation of fuel and energy resources which can be obtained through measures of the second trend is percep-

tible for the total volumes of energy use in the country. This is precisely why problems of increasing the coefficient of utility of fuel and energy resources is given so much attention [2].

Examining implementation of this trend in a long-term plan at the same time has technical limits which are governed, in particular, by the gradual depletion of the potentialities for improving the classic technologies, including classic heat-energy cycle in boilers, and especially at thermal power plants. Outlays for measures to improve the coefficient of energy utility will systematically rise, and at the final analysis, it will begin to exceed the cost of extraction and processing of the fuel, despite the trend for its increase. Under these conditions, reduction in the effective consumption of energy based on structural technological shifts, including creation of new nonenergy-intensive technologies become the promising (third) trend which guarantees the transition to an energy conserving path for development of the economy. This process will be implemented in the framework of a general reconstruction of the national economic structures aimed at intensifying and enhancing the efficiency of production. The outlays for energy conservation here are only a part of all the outlays for the development of productive forces. They cannot always be defined, and consequently, quantitatively estimated.

This trend includes, for example, development of new units in a number of sectors of the chemical industry; measurements associated with reduction in material-consumption of production, as well as measures that do not affect the design of the technologies and energy-using apparatus; improvement in the quality of roads resulting in a noticeable conservation of liquid fuel; structual shifts in production consisting of a increase in the percentage of less energy-intensive sectors of industry, improvement in heat stability of production, residential and public buildings.

Introduction of energy-technological plans in production of ammonia, methane, carbamide and a number of other products is predominately promising. With a sharp increase in the size of the units they guarantee a multiple reduction in the specific consumption of energy by using heat of chemical reactions.

The useful consumption of heat for heating industrial and residential buildings can be reduced by improving their insultation, by-facade and individual regulation of the heating regime. According to available estimates, increase in heat stability of residential building to the optimal quantities, exceeding the current level by 30-50 percent would guarantee fuel conservation for heating totaling 70-100 million T of conventional fuel.

One can consider on the whole that the ratio of conservation according to the examined trends to the visible possible conservation of fuel and energy resources is: 5-10, 35-40, 60-50 percent (figure 2). In practice, all of these trends will be realized simultaneously, however with a different degree of intensity.

The improvement in the structure of produced and consumed energy is a special, fourth trend in the energy conserving policy. This trend anticipates replacement of the more valuable and expensive resources with less valuable and less expensive. It stipulates such measures as advanced development of nuclear power engineering and open-pit mining of coal, changing transport to diesel fuel, efficient arrangement of production guaranteeing accelerated development of less expensive energy resources in secondary regions of the country. Electrification belongs to this trend.

Electrification is traditionally viewed as a process which is organically linked to an increase in consumption of primary energy resources and total energy-intensity of social production. Electricity is the most "energy-intensive" energy-carrier:

Energy Carriers	Consumption of conventional fuel for production of 1 Gcal of energy, kg
Electricity (modern GRES)	375
Steam and hot water:	
TETs and large boilers	160-180
Small boilers	200-220
Directly used fuel (minus 5-10 percent of losses for reprocessing)	150-157

When similar costs for different types of technical-grade fuel and boiler-furnace fuel in particular occurred in the past, overconsumption of primary energy resources and considerable outlays for "additional" transformation of fuel into electricity to a great measure limited the efficiency of electrification. At the same time, a number of new factors appeared which significantly changed the role of electrification in the fuel and energy complex.

The first of them is an increase in the cost of high-grade fuel with simultaneous relative stabilization of the rise in cost of electricity guaranteed by the development of nuclear power engineering and the use of inexpensive coals of the eastern regions of the country.

It should be stressed that electricity remains the only energy carrier which can essentially be obtained from all primary both renewable and nonrenewable sources. Expansion of the "raw material base" of electrification is the second important factor which changes its role in the fuel and energy complex. The most economical sources of primary energy can essentially only be involved in the broad national economic use through electricity: nuclear fuel, open-pit coal mining, water power. This reduces the use of scarce high-grade fuels, gas and especially oil for large stationary power engineering. The role of electrification will rise with the involvement of new and nontraditional energy sources into use.

Even now in the USSR about 26 percent of the primary fuel and energy resources are consumed in the national economy in the form of electricity. With an increase in this percentage in the future to 40 percent [4], electrification and electricity will be converted into an important lever for improving the fuel and energy complex of the country.

The replacement by electricity of scarce high-grade fuel or heat energy obtained on its basis is an important trend through which electrification affects the use of fuel and energy resources and the entire structure of the fuel and energy complex. For this purpose the changes in the structure of the primary energy must be accompanied by a corresponding reconstruction of the entire consumer energy apparatus. This reconstruction should take place on two paths:

Displacement of the energy-consuming equipment and apparatus operating on oil and gas with electrical equipment. In this case the basic principles for the technological process, just as the specific consumption of useful energy for the production of the product and services, remains unchanged on the whole;

Introduction of basically new electricity technologies which guarantees replacement of the technologies on high-grade fuel. In this case consumption of use of energy is reduced.

Analysis indicated that as a result of replacing high-grade fuel with electricity, one can obtain a pure saving of fuel and energy resources, if the advantage of the consumers (because of the difference between the generally higher efficiency of the electricity-consuming equipment and the lower efficiency of the equipment in alternative variants) covers the energy losses during the transformation of organic or nuclear fuel into electricity. In other cases, the fuel and energy resources as a whole are not conserved. A certain overconsumption of them is even possible. The obtained energy effect is explained exclusively by the difference between the cost in electrictiy and the displaced fuel. In all cases one should take into consideration other types of effect of electrification (conservation of raw material, increase in quality of the obtained product, decrease in labor-intensity of production).

One can examine the following areas of application of electricity instead of high-grade fuel: in industry: smelting of pig iron in machine construction: smelting of steel, smelting of nonferrous metals, heating of metals and pipe blanks for plastic deformation, heating of rolled products, pipes and blanks for thermal and thermal-chemical treatment in machine construction, drying in machine construction, paper, light and food industry; warming of the work areas, baking of bread; in agriculture: producing hot water, creating a microclimate in animal husbandry areas, drying of feed and agricultural products; in daily life and the service sphere: cooking of food, heating and hot water supply based on heat pumps and storage systems of electricity supply. Railroad transportation and especially compressor stations of gas pipelines in the future will become large-scale areas of the use of electricity instead of high-grade fuel.

It is necessary to have a comprehensive approach to evaluating the energy-intensity of processes. Thus, in the production of electric steel or synthetic pig iron in electric furnaces, the total outlays of primary fuel and energy resources diminish because of the broader potentialities for using scrap with a rise in consumption in electricity (Table one).

Table 1.

Consumption of Electricity and Energy Resources for 1 T of Steel with Different Methods of its Production

(1) Способы производства стали	Характерные соотношения жидкого чугуна и лома в шихте для производства стали (2)	(3) Расход ресурсов по стадиям передела					
		(4) доменный процесс		(5) сталеплавильный процесс		(6) всего	
		(7) кВт·ч	(8) т у. т.	(7) кВт·ч	(8) т у. т.	(7) кВт·ч	(8) т у. т.
(9) Кислородно-конвертерный	4 : 1	120	0,80	60	0,32	180	1,12
(10) Мартеновский	1 : 1	75	0,5	70	0,15	145	0,65
(11) Электросталеплавильный	0,05 : 1	10—15	0,05	550—600	0,28	560—615	0,33

Key

1. Methods of Steel Production
2. Characteristic Ratios of Liquid Pig iron and Scrap in the Burden for Steel Production
3. Consumption of Resources by Stages of Conversion
4. Blast-Furnace Process*
5. Steel-Smelting Process
6. Total
7. kW x h
8. T of Conventional Fuel
9. Oxygen-Convertor
10. Open-Hearth
11. Electric-Steel Smelting

* Including extraction and concentration of ore, as well as preparation of fuel.

The presented examples are a good illustration of the link between energy-intensity of the product and its material-consumption. This link is expressed most clearly in machine construction where consumption of electricity for 1 T of consumed metal systematically rises, while electricity-and energy-intensity of the product in calculation for R 1 drops as a result in the drastic decrease in its material-intensity in a natural form [5]. In nonferrous metallurgy, autogenic processes are especially effective. They make it possible to use raw material energy. Thus, the electricity-intensive oxygen-flame smelting (OFS) with overconsumption of about 1,000 kW x h for 1 T of blister copper provides a saving of about 0.8 T of conventional fuel, including 0.5 T of conventional fuel which can be considered an absolute saving. The energy component of the OFS (instead of conversion) and the component of the alternative classic plan (roasting + reflecting smelting + conversion) are the same when electricity costs 16 R/MW x h and fuel costs R 25 T of conventional fuel (computed according to [6]).

Conditions for replacement of fuel by electricity are indicated in table 2.

Among the new trends in use of electricity instead of high-grade fuel in industry, one should note the production of nitric acid by plasma-chemical methods, and in the future new methods are possible which replace firing of mass materials; use of electricity in the processes of high-temperature heating of liquids and gases in the oil refining, petrochemical and chemical industry. The method of local electricity heating of work areas with the help of electrical infrared emitters is also important.

The preliminary studies made in the Azerbaijan Scientific Research Institute of Power Engineering in Baku under the supervision of G. Yu. Sultan-Zade indicated that switching to electricity in oil refining, in addition to conservation of high-grade fuel could drastically (sometimes by an order) reduce the overall dimensions of the furnaces, and diminish environmental pollution. With a cost of oil fuel 70-100 R/T and electricity 16-17 R/MW x h, the outlays for energy carriers in alternative variants of heating in the oil refining processes reach 90 percent of the outlays for the technology as a whole, while electrical heating becomes effective when the fuel costs 65-85 R/T.

It is common knowledge that in many sectors of industry, traditional systems of heating buildings are associated with great overconsumption of heat, since in order to maintain sanitary-hygienic conditions, and sometimes to manage the production process the creation of a temperature regime is not required in the entire production room, but only in individual zones, primarily directly at the work areas. This especially refers to nonlabor-intensive sectors of industry with large overall dimensions of the equipment and height of the production shops (ferro-alloy shops, for example). In these cases, part of the volume of the industrial buildings directly surrounding the work areas to be heated with the help of local infrared emitters is no more than 5-10 percent of the total volume of the shop. One can use local heating to achieve a total economy of fuel equal to 30-40 percent and more. In some cases, local heating of the work areas should be used to supplement the base temperature of (10-14° C) which can be attained by traditional systems over the entire volume of heated industrial buildings.

Table 2.

Cost of High-Grade Fuel, above which the Use of Alternative Electrical Technologies becomes Effective, R/T of Conventional Fuel

Areas of Application of Electricity in Industry	Alternative Technologies With Cost of Electri-					Increase in Consumption of Electri-
	Traditional	For Elec- tricity	city, kop/kW x h 1.2	1.4	1.6	city for a Unit of pr
Heating of Pipes for rolled products	Flame furn- aces	Electric furnaces	20	25	30	380 kW x h/T
Heating of Blanks for stamping	"	"	20	25	30	500 kW x h/T
Drying in Paper industry	Drying by steam	High-fre - quency units	39-95	40-105	45-110	140-800 kW x h/T
Drying of Cotton fabrics	"	Electrical Drying	30	45	55	790 kW x h/ 1000 m^2
Cooking of Food	Gas stove	Electric plate	45	55	75	1100 kW x h /apartment
Railway traction	Deisel engine	Electric engine	30	35	40	million x kW x h/km
Gas pipeline compressors	Gas	Electrical	0	0	0	
Heating in Southern regions of the country	From boil- ers	Heat pumps	10	15	20	3760 kW x h/ apartment
Production of hydrogen	pyrolysis of methane	Electrolysis of water	90	100	110	2000 kW x h/T
Auto transport	Car	Electric car	140	160	180	5400 kW x h/1 one car
Firing of materials	Traditional	Electrical technology	15	20	25	600 kW x h/T

In agriculture one can isolate, for example,energy-intensive production of grass briquets. The outlays of scarce liquid fuel consumed to produce them, in calculation for 1 L of milk is no less than 400-500 g and for 1 kg of meat 3.5-4 kg. With a cost of liquid fuel 100 R/T, the energy component for producing grass briquets will equal 4-5 kop/1 of milk and 35-40 kop/kg of meat. Replacement by electricity of high-grade fuel with regard for the difference in efficiency of the units will cut these outlays no less than in half and will conserve hundreds of thousands of liquid fuel.

Increase in the cost of high-grade fuel affords new potentialities for electrification of transport. An example of this is electric traction and gas pipeline compressors.

In the 1970-1977 period, the rates of electrification of railroads in the USSR significantly dropped: whereas in 1960-1965 increase in the length of the range with electric traction annually was 2000 km, in 1971-1975 it was 1000 km, in 1976 900 km, in 1977 and 1978 600 km. This was determined by the fact that electrification of the most loaded two-way railroads where electric traction was more effective had primarily been completed. Electrification of the less loaded railroads was considered inefficient, with the acception of trunklines with especially complicated traveling conditions (intersected relief, presence of tunnels).

At the same time, as is known, the energy component in the cost of the haulage work of transportation is very high. Whereas the consumption of diesel fuel for 10,000 T/km of operation gross is about 30 kg (or 42 kg in conventional fuel), then with fuel cost of 25 R/T of conventional fuel the adjusted energy outlays for this work will be R 1.05, and with cost 50 R/T of conventional fuel, already 2 rubles and 10 kopecks. Consumption of electricity for this same work is about 100 kW x h with estimate according to adjusted outlays of R 1.3-1.6, and in the eastern regions even R 1.1-1.3.

In addition to conserving the permanent part of operating outlays, conservation of resources for the energy component will make it possible to compensate for capital investments for electrification of railroads in acceptable periods already with significantly lower "critical" values of the freight traffic. With a doubling of the adjusted outlays for liquid fuel as compared to the current level, it is economically efficient to increase the length of electrified railroads in the USSR by no less than 20,000-25,000 km.

The conversion of gas pipeline compressors to electricity is more important from the viewpoint of the scales of conservation of high-grade fuel. The number of compressor stations which will appear in the future or will exhaust their service life and will need equipment replacement number in the dozens, in each compressor station consumes about 200,000 T of conventional gas per year.

The transition to electrical compressors is effective in the regions encompassed by large energy systems already for constant outlays because of the decrease in the number of compressor stations and the lower capital-intensity of electrical equipment as compared to equipment on gas drive. Displacement of gas by electricity guarantees an additional economic effect (Table 3).

Table 3.
Preliminary Indicators for Efficient Use of Electrical Compressors Instead of Gas Compressors at Gas Pipelines (In the Example of 10 Replaceable Compressor Stations)

	Показатели (1)	(2) Ед. изм.	Газовые компрессоры (3)	Электрокомпрессоры (4)
(5)	Число компрессорных станций	ед. (6)	10	9
(7)	Полезная производительность по газу	млрд. м³ (8)	12,4	12,4
(9)	Расход газа на собственные нужды	млрд. м³, (8)	1,62	—
		млн. т у. т. (10)	1,85	—
(11)	Расход электроэнергии	млрд. кВт·ч (12)	0,43	4,61
(13)	Расход топлива на выработку электроэнергии	млн. т у. т. (10)	0,12	1,52
(15)	Капиталовложения (без энергетики)	млрд. руб. (14)	0,82	0,72
(16)	Постоянные издержки	»	0,05	0,03
(17)	Приведенные затраты без энергетики (при $K_э$=0,125)	»	0,152	0,12
(18)	Затраты на энергию при 1,6 коп. за 1 кВт·ч и 50 руб/т у. т. газа	»	0,097	0,074
(19)	Всего приведенные затраты	»	0,349	0,194
(20)	Экономия топлива	млн. т у. т. (10)	—	0,45

Key:
1. Indicators
2. Unit of measurement
3. Gas compressors
4. Electrical compressors
5. Number of compressor stations
6. Unit
7. Useful productivity for gas
8. Billion m^3
9. Consumption of gas for in-house needs
10. Million T of conventional fuel
11. Consumption of electricity
12. Billion kW x h
13. Consumption of fuel for electricity generation
14. Billion rubles
15. Capital investments without energy)
16. Permanent costs
17. Adjusted outlays without energy (with K = 0.125)
18. Outlays for energy with 1.6 kop for 1 kW x h and 50 R/T of gas
19. Total adjusted outlays
20. Fuel conservation

The task of conserving high-grade fuel in addition to ecological reasons makes it more necessary to develop new efficient systems and surface rail-free transportation, primarily electric cars.

An important factor for conserving high-grade fuel in daily life and the service sphere is the development of heat supply based on heat pumps. The prerequisite for the development of this trend in the near future will by the development in the USSR of mass production of room air conditioners.

Calculations conducted by the author together with engineer V. I. Chemodanov indicate that the adaptation of air conditioners for operating in a heating mode is effective as compared to heating from boilers with output up to 25-30 Gcal/h under the following conditions: average seasonal heating coefficient of the heat pump equals 30 (i.e., for 1 kW x h spent in it, which is equivalent to 860 kcal, through the use of free secondary heat sources, the external air, ground water, waste water of industrial enterprises etc., about 2,500 kcal are obtained); cost of fuel used in the boilers exceeds 40-45 R/T of conventional fuel; the heat load peaks are removed by the heaters, the "finishers" of direct operation whose cost is R 10-20 for 1,000 kcal/h (versus the higher, by an order, cost of heat pumps). In this case no less than 1.5-2-fold conservation of primary fuel and energy resources is guaranteed as a whole.

It is our opinion that conservation roughly totaling 20 million T of conventional fuel per year is already basically possible in the 11th Five-Year Plan. Consumption of electricity to implement this conservation will be about 50 billion kW x h. Total conservation of primary fuel and energy resources in this case will be 4 million T of conventional fuel and the conservation of adjusted outlays will be about 1 billion rubles per year.

The amount of displacement of high-grade fuel by electricity in the future may potentially be significantly higher.

Practical implementation of measures to displace high-grade fuel, and its energy conservation as a whole, must take into consideration the regional aspect, in particular the greater efficiency of electrification based on nuclear energy in regions of the European sector of the USSR where the cost of gas and liquid fuel is especially high.

The development of electrification in order to displace especially scarce high-grade fuels does not negate, but on the contrary, assumes the maximum conservation of electricity, the creation of reliable shields excluding its inefficient, wasteful use. Conservation of electricity is a question which deserves especial examination, beyond the framework of this article. We will indicate here merely the main conclusions which determine the technical policy in the area of conserving electricity, interrelated with principles of conserving energy as a whole.

Consumption of electricity, like other carriers, is not only a technical, but also an economic category. Therefore, one of the important trends for improvement in the efficient use of electricity is realization of the electrification of individual sectors in the national economy as a whole which is optimal for the given conditions. Electricity must be used only in those areas where it is economically efficient from the viewpoint of the entire national economy. Conducting of particular measures for energy conservation must be evaluated from general economic positions, and not permit an increase in the adjusted outlays.

Some objective shifts in the structure of production, in which the percentage of the sectors, subsectors and products with lower electricity-intensity (for example, increase in the percentage of machine construction, whose electricity-intensity is half that of industry as a whole, and within machine construction, instrument making and electronics) are very important for conserving electricity and all types of energy.

Decrease in material-intensity of production, in particular, increase in the output of metal in different conversions, as well as the use of secondary raw material resources is very important for saving electricity, and on the whole for the energy conserving policy. Thus, increase in production of copper based on secondary raw material requires 3-4, and aluminum even 20-fold lower outlays of electricity than from primary raw material.

As for the energy conserving as a whole, improvement in efficient consumption of electricity can be done in 3 basic directions: improvement in the accounting and monitoring of the use of this energy carrier, improvement in the efficiency of energy-consuming processes, decrease in consumption of useful energy by changing the production technology. In this case one should take

into consideration the current trends for enhancing the electricity-intensity of social production. However, the other production resources conserved by introducing electricity as a whole increase the efficiency of production.

Among the trends of electricity conservation one should note an improvement in loading the electrical equipment, and its updating; replacement of a large number of electric motors whose power is underused, with electric motors of lower power; displacement where it is possible, of pneumatic tools and pneumatic equipment with electrical tools and electrical equipment in order to reduce the percentage of electrical-intensity of the process of obtaining compressed air. Guarantee of better loading of the equipment, improvement in insulation, use of pre-heating of the burden in metallurgy, raw material and intermediate products in the chemical industry is very important in thermal technologies.

Decrease in the use of consumption of electricity is achieved by introducing basically new methods for producing products, for example, energy-technologies in the production of ammonia (decrease in consumption of electricity from 1200-1500 to 50-150 kW x h for 1 T of product) and methanol, use of new methods for producing aluminum, introduction of autogenic smelting instead of reflecting in copper-nickel industry (decrease in electricity consumption by 30-50 percent).

The use of semiconductor equipment, including in appliances, optimization of operating regimes of equipment and instruments of external lighting and automated control of them, etc. have great importance for reducing on electricity consumption.

As indicated by the preliminary calculations, one can reduce the consumption in electricity in the national economy already in the 11th Five-Year Plan by 50 billion kW x h per year, or by 3 percent in relation to its possible consumption at this level by using all the indicated factors.

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ENERGY CONSERVATION

'KAZAKHSTANSKAYA PRAVDA' CALLS FOR WINTER PREPARATION

Alma-Ata KAZAKHSTANSKAYA PRAVDA in Russian 15 Sep 82 p 1

[Editorial: "Prepare the Enterprises for Winter"]

[Text] In competing for a worthy meeting of the 60th anniversary of the formation of the USSR, the republic industry workers have fulfilled ahead of schedule the plan for 8 months of the second year of the five-year plan for production of the majority of the most important types of items and sale of the product. Work of the enterprises of the oil and petrochemical industry, nonferrous and ferrous metallurgy, machine construction, industry of the Alma-Ata, Gur'yev, Mangyshlak, Taldy-Kurgana, and Chimkent Oblasts has improved. At the same time, individual enterprises are not fulfilling the set assignments for production and supplies of products. This causes well-founded concern.

An important role is given to industry in implementing the food program. "In solving questions associated with the food program," member of the CPSU Central Committee Politburo, first secretary of the Kazakhstan Communist Party Central Committee, Comrade D. A. Kunayev noted, "we do not have the right to weaken our attention to the work of the multisector industry, major construction, transportation and communication, recalling that they must be involved in the implementation of tasks set by the May (1982) CPSU Central Committee Plenum."

With the onset of autumn, the final stage in the struggle of the working collectives for successful fulfillment and overfulfillment of the annual assignments and commitments began. The final results now depend a lot on how the workers of industry will act in the remaining months. The approach of the cold noticeably complicates the work of industry, construction and transportation. Additional measures are needed in order to preserve the high rhythm of production, systematically raise its efficiency. The most important is to meet the onset of cold fully armed, to conduct the outlined set of organizational-preparatory measures in time at each plant and combine, at each construction site, mine, and transportation and communication enterprise.

Local party, soviet and trade union agencies, leaders of ministries and departments, many economic subdivisions are focusing a lot of attention this year on preparing for work under winter conditions. In addition to the current work, they are implementing the previously outlined measures. In some sectors, in the leading production collectives, the entire system of this preparation has been

worked out well, and has become an inseparable component of the plan. Especial concern has been shown for the working man, so that he works with a good mood and high productivity in the difficult cold season.

Such a major sector as the food industry is actively preparing for winter, for example, back in the beginning of June, a special decision was adopted here which defined the periods for conducting a certain measure. Workers of the ministry who control the course of work locally and give the necessary help were assigned to individual enterprises. The preparatory cycle has been completed at the majority of enterprises of the department for basic directions, and final work is underway. A lot has also been done at many enterprises of nonferrous metallurgy, machine construction and light industry. The Karaganda plant of asbestos-cement items, the Semipalatinskiy plant of construction materials and other enterprises of the Ministry of Construction Materials Industry are paying proper attention to the prewinter concerns.

At the same time there are instances of an incorrect attitude to the important national economic campaign, complacency where it is hoped that there is still much time before the onset of cold. The main idea in the prewinter preparation is to create the necessary reserve of fuel, conditions which guarantee continuous supply of the national economy and the population with electricity and heat. Taking into consideration that its shortages in the fall-winter period of 1981-1982 were the reason for the development of many difficulties, and resulted in losses in the manufacture of industrial products, the Kazakhstan Communist Party Central Committee and the republic council of ministers have obliged the ministries and departments, administrations of railroads, industrial associations and enterprises to strengthen extraction, production and shipment of fuel, accumulation of its reserves and power plants, enterprises and in the organizations.

Specific periods for execution of the outlined measures are often disrupted, however. Fuel extraction in the associations "Karagandaugol'" and "Ekibastuzugol'" is rising at insufficient rates. The Alma-Ata and Tselinnaya railroads do not guarantee supply of cars for loading even that coal which is available. Consequently the schedules for filling the fuel reserves at the power plants, enterprises of industry, construction and the residential-communal services are disrupted. The enterprises of nonferrous metallurgy alone have not received 27,000 T of coal as of today.

Stability in the operation of all the sectors of the national economy also depends on the precise and continuous operation of the energy enterprises. Good electricity supply, normal supply with heat in the fall-winter period are especially important. Nevertheless, the power engineers do not yet fulfill the planned repair operations in time, and the leaders of individual energy systems and enterprises repeat the errors of last year.

The duty of the soviet and trade union agencies, economic leaders, all the collectives of the fuel and energy and transportation enterprises is to deeply and comprehensively analyze the local situation, take urgent measures to eliminate all the permitted shortcomings in preparing for work in the fall-winter period of 1982-1983.

The construction workers have to work under complicated conditions in winter, often in the open air. It is necessary to be concerned in advance that the low temperatures do not influence the course of the work. Only organizational lack of preparation can explain the fact that in the winter of last year the administrations of the ministries of construction enterprises of heavy industry, agricultural construction, installation and special construction work in the coldest regions of the north, west, center and east of the republic lost a lot of work time.

Preparation for work in winter touches all aspects of life and activity of the labor collectives. In fact, there are no and there cannot be any trivial details. To keep in mind everything on which the precise rhythm of production, conditions and work safety depend is the very first duty of the party and trade union committees of the enterprises, people's controllers, and leading Komsomols.

To meet winter fully armed at each industrial and transportation enterprise, and at each construction site is to create conditions for successful work in the most difficult period for production, successful fulfillment of the assignments in the current year, and a good labor start in the third year of the five-year plan.

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ENERGY CONSERVATION

ENERGY-CONSERVING SUGGESTIONS MADE

Conservation Competition Results Announced

Moscow EKONOMICHESKAYA GAZETA in Russian No 47, Nov 82 p 17

[Article by S. Krivtsov, head of the press sector of the VSNTO: "Results of the Competition"]

[Text] The results of the all-union competition for the best suggestion for conservation of electricity and heat organized by the All-Union Council of Scientific-Technical Societies, central board of the Scientific-Technical Society of Power Engineering and Electrical Engineering Industry, and the USSR Ministry of Power and Electrification have been summarized.

The commissions for cooperation with the all-union competition in the enterprises jointly with the republic, kray and oblast councils of the scientific-technical societies have examined all 5,000 suggestions whose introduction conserved 1.8 billion kilowatt-hours of electricity and 22.7 million gigacalories of heat. Prizes were awarded to 195 of the most efficient developments.

The workers of the oil and gas extracting administration "Prikamneft'" found an interesting technical solution. According to the plan, injection of water into the bed was stipulated at this field in order to maintain the bed pressure. The authors suggested injecting water not continually, but in pulses. The experience indicated that this method was much more effective. As a result, 5.2 million kilowatt-hours of electricity per year were conserved.

The competition jury noted that a number of ministries and the corresponding scientific-technical societies did not focus the proper attention on the development of efficiency work for conservation of energy. There was no suggestion in the competition from the commissions for assistance at the enterprises "Kamchatskenergo," "Komienergo," "Krymenergo," "Kustanayenergo," "Ryazan'energo," "Sakhalinenergo," "Tyumen'energo." In certain republics, krays and oblasts local competitions were not held for the best suggestion for conservation of electricity and heat, including in such industrially developed oblasts as the Kursk, Kharkov, as well as in the Georgian and Khirgiz SSR.

Information about the most valuable suggestions noted in the all-union competition and recommendations for introduction were sent to the appropriate ministries, departments and scientific-technical societies.

Fuel Consumption Reducing Suggestion Made

Moscow EKONOMICHESKAYA GAZETA in Russian No 47, Nov 82 p 17

[Article by A. Potul'nitskiy, engineer-geophysicist: "A Reader Raises a Question"]

[Text] It is now very difficult to set up objective control over consumption of fuel during the operation of drilling and power units. One can only judge how many motor hours have been spent, and correspondingly, how much fuel by the reports of the motor mechanics where the indicators are sometimes exaggerated. The actual quantity of motor hours spent is practically impossible to establish, since it depends on many factors (here there is both the category of rocks, and the temperature, and the technical conditions of mechanisms).

In my opinion the use of equipment will be improved if reduction in the quantity of motor hours per unit of volume of work is stimulated in the wages of the motor mechanics.

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ENERGY CONSERVATION

ENERGY-CONSERVING MEASURES IN CONSTRUCTION OUTLINED

Moscow STROITEL'NAYA GAZETA in Russian 8 Sep 82 p 3

[Article by V. Drozdov, doctor of technical sciences, professor, honored worker of science and technology of the RSFSR: "Ten Years Ahead"]

[Text] We will begin with certain numbers. The annual outlays of the fuel and energy resources for major construction in the country, heating and water supply of buildings is over 500 million T of conventional fuel. Reduction in consumption merely by one percent will provide fuel during the year for all the residential and public buildings put into operation.

In fact the energy resources can be used much more efficiently than currently is done. This is why the sector program to solve the scientific-technical problem "Improve the Heat-Shielding Qualities of the Enclosures and Introduce Energy-Conserving Systems of Lighting, Heating and Air-Exchange" was developed in 1981 and approved by the USSR Gosstroy. A total of 92 scientific research, planning and production organizations are participating in its implementation, and it should be said that definite results have already been achieved.

Calculations indicate that improvement in efficiency of the volume-planning decisions alone, in particular the fully assembled residential buildings will reduce their heat losses by more than 20 percent. These are theoretical calculations, but experience...Say that an increase in the width of the structure is the most effective architectural means of reducing specific heat losses of buildings. However, the transition to a wide structure in residential construction is associated with significant complications: it cannot be attained through mechanical increase in the depth of the rooms. The buildings with wide structure must have new designs, and this requires skill and the desire to cope with the task.

New climate zoning is currently being introduced into practice, new methods have been suggested for comprehensive calculation of the climate parameters not only of the environment, but also the internal microclimate. Comprehensive calculation of these parameters during planning of buildings will also permit, by preserving the comfortable conditions, significant concentration of build-up in the microregions.

The extensive use of the automatic system for regulating supply of heat, including based on measurement-computer equipment can yield a great effect. In this

case from 5 to 10 percent of the heat is conserved. Further development of automatic systems is based on the use of minicomputers to monitor and control heat consumption. They make it possible to save up to 30 percent of the heat. Several of these systems have been installed in the central cardiological hospital, the international trade center and other facilities.

The Scientific Research Institute of Construction Physics jointly with the automobile plant imeni Leninskiy Komsomol for the first time in our country have developed an automated control system of the heating-ventilation system and minimization of energy consumption for heating using only domestic equipment. In the 1980-1981 heating season, the work of the automated system as an "adviser" provided a saving of up to 20 percent of heat. A large-scale experiment on this basis will permit guidelines to be developed for planning automated systems of controlling heating-ventilation of production buildings.

In a word, a lot has been done and is being done. This list cannot be continued, it is very great, but there are certain basic tasks which should be mentioned especially. For example, in the chapters SNiP II-3-79 "Construction Heat Engineering" and "Construction Climatology" a new principle has been established for determining the heat-shielding indicators of enclosures, based on the magnitude of the economically expedient resistance to heat transfer which orients the designers on the use of multilayer energy-wise economical enclosures.

We will take the fact which would seem to have particular importance: the area of application of windows with triple glazing has significantly expanded. Now its lower boundary passes through the Vologda, Ivanovo, Yaroslavl, Kostroma, and Ulyanovsk Oblasts in the European sector of the USSR and encompasses the entire West and East Siberia. Consequently, this is not at all a "local occurrence".

Requirements have been introduced for the first time of some shielding devices in buildings which are designed for construction in regions with calculated July temperature of 21°C and higher. This permits a decrease of the load on the air conditioning system by 15-20 percent. Comparison of the requirements adopted in Chapter SNiP "Construction Heat Engineering" with the foreign standards and norms (Finland, Sweden, United States, FRG) indicates that their average level for restricting heat losses is no lower, and in certain cases is even higher than in the comparable foreign norms. The confirmed effect from introducing norms in 1981 was about 1 million tons of conventional fuel.

In March of this year the State Committee for Science and Technology and the USSR Gosstroy by agreement with the USSR Gosplan confirmed the program for efficient use of fuel and energy resources in construction for 1982-1985. The development of this program which is targeted and comprehensive in importance and substance, was preceded by a thorough study of the situation in the construction ministry and other ministries and departments, union republics, as well as generalization of results of scientific research, experimental work, and study of the foreign experience. One should take into consideration that in domestic practice, the program for conservation of fuel and energy resources in construction was developed for the first time, therefore the most important methodological task was to select the general trend for the program as a whole and the assignments for the first level.

This trend was also analytically defined in the conventional reified model of building or structure as a unified energy-consuming complex. The central link in the program is new assignments for introduction into construction practice of energy-conserving designs based on the scientific research, experimental planning and construction conducted in the 10th Five-Year Plan.

The program also stipulates the fulfillment of working drafts, broad-scale introduction of the effective technological processes and designs, and the creation of new standard-technical documents for model designing. For example, in the production of items made of precast reinforced concrete, it is stipulated that the steaming chambers be updated with increased level of heat-shielding, more advanced standards of energy consumption be developed and introduced in heat treatment of concrete, and also the results of long-term scientific studies be introduced. In the implementation, say, of construction-installation work it is planned to develop and introduce comprehensively mechanized technological processes and more effective sets of machines with attached equipment.

Of course it is impossible to list everything. I will recall, however, those parts of the programs such as introduction into construction practice of economical types of production and residential buildings which guarantee decrease in consumption of fuel and energy resources by the use in them of new types of enclosures, filling of light openings with increased level of heat shielding and new volume-planning designs for automatic systems of combined lighting, use of solar radiation heat and geothermal water. Planning and construction of new industrial complexes with implementation of the principle for reducing the length of the heat pipes and efficient use of heat and energy resources (Tobola NKhK, Altay coke-chemical plant and other complexes) is very important.

Erection of residential and public buildings with systems of solar and heat-and cold-supply, construction of experimental-industrial geothermal power plants and the systems of geothermal heat supply have been outlined.

Primary attention has been focused on the need to put into operation more advanced standards of designing with increased requirements for heat-shielding of buildings and structures, and the creation of methods and resources for monitoring heat-protection of the enclosures.

Thus, the program stipulates the primary specific assignments for the current five-year plan and for the period up to 1990 for the ministries, departments and union republic councils of ministers. Fulfillment of these assignments must promote a prudent use of coal and energy resources in construction.

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BRIEFS

STATE STANDARD FOR NATURAL GAS--The state standard has approved a program of work to improve the accuracy of measuring and calculating the quantity of natural gas for 1982-1985 for its efficient use and all possible conservation. The program, prepared by the Ministry of the Gas Industry jointly with the State Standard stipulates the development of twelve standard-technical documents, including to calculate natural gas for technological needs and losses during operation of main gas pipelines, evaluation of gas leakages, and others, as well as review of the state standards; development of ten names of workers and eight names of model measurement equipment. Conducting of planning-research, scientific research, and experimental design work is also outlined. A distinguishing feature of the program is organization of production of a considerable number of measurement instruments at the instrument-making plants of the Ministry of the Gas Industry. [Text] [Moscow EKONOMICHESKAYA GAZETA in Russian No 33, Aug 82 p 11] 9035

FUEL CONSERVATION--One-fifth of the heat consumed in Estonia can be conserved by a small device developed by the Tallinn and Belorussian scientists for systems of heating residential and production buildings. The basis of the innovation is the standard liquid flow gage from those manufactured in series. It was equipped with a thermometer which is placed in the pipeline. The readings of the instruments are analyzed by a minicomputer. Numbers are printed out on to it which indicate the quantity of heat used to heat the building in the last hour, day and month. The electronics also prevent an overload in the system. The experience of operating the new heat counters makes it possible to recommend them for broad dissemination in the country. The Ministry of Instrument Making, Automated Equipment and Control Systems has allocated the resources for this. [Text] [Moscow SOTSIALISTICHESKAYA INDUSTRIYA in Russian 27 Jul 82 p 2] 9035

ESTONIAN FUEL CONSERVATION--Narva, Estonian SSR--The collective of the Estonian GRES has reduced specific consumption of fuel for generation of one kilowatt-hour of electricity by 1.5 grams since the beginning of the year as compared to the standard. This resulted in a conservation of over 23,000 T of local fuel. This is a record indicator of economy for thermal power plants operating on fuel shales. The basis for the success was over 100 efficiency experts suggestions issued by innovators. [Article by V. Proskura, in-house correspondent] [Text] [Moscow SOTSIALISTICHESKAYA INDUSTRIYA in Russian 14 Aug 82 p 1] 9035

TAJIK FUEL AND ENERGY CONSERVATION--About 10,000 people's controllers, and specialists of many sectors of the economy participated in a review of conservation

of fuel and energy resources in the Tajik SSR. Over 1,500 enterprises and organizations were checked. The review was successfully made and to a great deal promoted the fact that in the republic 105 million kilowatt-hours of electricity, over 73,000 gigacalories of heat and about 8,000 tons of diesel fuel were saved during the year. [Article by I. Andreyev] [Text] [Moscow PRAVDA in Russian 10 Jun 82 p 3] 9035

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GENERAL

PROBLEMS OF SOUTH YAKUTSK TERRITORIAL PRODUCTION COMPLEX DISCUSSED

Equipment Shortage Problems Still Unresolved

Moscow STROITEL'NAYA GAZETA in Russian 15 Sep 82 p 2

[Article by V. Antonov, our special correspondent: "2. Around the Quarry"]

[Text] All four phases of the quarry under construction should produce 13 million tons of coal in 1985. Only the first phase has been opened. The stripping operations are considerably behind the planned schedule. Whereas in the last four years roughly 80 million t of upper rock have been removed, in the last two years up to 200 million had to be taken from the lower and difficult levels.

There is not enough equipment, this is the explanation in the USSR Ministry of the Coal Industry. They say that they have not yet received a single 180-ton domestic dump truck that should have arrived in 1978. There are very serious delays in the shipment of coal carriers and 20-cubic excavators. Speaking in bureaucratese: 'it's all taking place'. At the same time I propose to ask the reader this question: how is the equipment which has already been obtained operating?

According to the official data, 85 imported dump trucks and 16 domestic coal carriers with load capacity of 180 tons each have been received in Neryungri. The fleet of 20-cubic excavators numbers 10 imported and 3 domestic in operation plus 3 domestic in installation. The annual productivity, computed for Neryungri (I stress: Neryungri, and not for some weather conditions and soils in general) for the dump truck is 645,000 tons, and the excavator up to 6 million tons of rock. It is easy to compute that the imported equipment alone can work roughly 55-60 million tons per year. And actually? The plan of the quarry for stripping for the current year is 44 million tons, and less than 13 million have been removed in 6 months. Is it not true that these data are impressive? They require a critical evaluation. And analysis: why?

There are circumstances which to a certain degree do not depend on the USSR Ministry of the Coal Industry (the ministry tries to assert that they do not depend at all, and advances this reason to explain the interruption in the stripping operations). What are the reasons? Imperfection of equipment, which I heard in Neryungri from the brigade foreman of the very first domestic unit V. Yegorov:

"The foundry hands of 'Uralmash' work poorly. Their items break down without ever having been used."

The comrade was supported by the brigade foreman of mechanics-installers assembling "EKG-20," S. Salamakhin:

"Rather than assembly, it's torture. There is a defect in every unit. Quite often the openings for attaching rotation and lifting reducers do not coincide. The workers of Uralmash perform no monitoring of assemly at all."

The representives of "Uralmash" justify themselves with the fact that the machine is experimental, the rates of developing were assigned so that it is simply impossible to fulfill many positions. I think, respected reader, that we will not take these excuses seriously. If we logically continue this justification, then one can allow not only the shipping of assemblies without checking, but to generally switch their manufacture to the quarry, where it is said it will be faster. Judging from everything, this is where things are going.

It would seem that nothing would be simpler than to send the assembly in a single package. But no, they're sent in loose parts and in several boxes.

However, having found a speck of dust in another's eye, you do not notice the log in your own; this wise saying forces us to return to the Ministry of the Coal Industry and how they guard the equipment here that in all sense of the word is priceless.

We don't take care of it at all, due in large part to the in-house lack of organization," V. Yegorov, answered my question. We are already acquainted with the brigade foreman of the domestic 20-cubic excavator EKG-20.

Here is a recent example for you: during the shift there were eight cutoffs of electricity without warning. This means that there were 8 emergency situations for the excavator which cannot endure such abuse. In addition to the mechanical equipment, a computer has been essentially installed."

The brigade foreman has other claims against the local organizers of production. They say that the blasters prepare the workfaces poorly. No matter how powerful the machine, it does have limits. It cannot turn over the multi-meter beds of rock without the appropriate preparation.

Thus, productivity is reduced and the period of smooth service of the excavators is reduced for two reasons. But perhaps this is not the complete reason, but a consequence of two deep processes. Say, insufficient skill of the electricians, blasters and excavators? After asking myself this question, I immediately received the answer. It turned out that the electricians were responsible. They simply have not yet fulfilled the plan for the electrical supply circuits and the power travels on a temporary circuit. But if the temporary circuit is somehow suitable for a primitive five-ton crane, the Neryungri excavators equipped with electronics cannot withstand its spontaneous interruptions. They malfunction.

Not everything is going well with the qualifications as well -- not for the electricians, but rather the excavator operators.

The machines are assembled by a brigade which is already skilled in its work; but those who will to operate it have never seen such a machine. Why is the operating crew not included in the assembly process so that it becomes familiar with the features of the machine beforehand? What is standing in the way? Trifles. One subdivision of the USSR Ministry of the Coal Industry assembles the excavator, while another operates it. Again departmental barriers within the ministry which we have already encountered in the apparatus of the USSR Ministry of Power and Electrification. Is this an epidemic?

Are not temporary things an epidemic disease? Several dozen kilometers of gravel road from the quarry were made carelessly, with gross violations of the project. Enormous dump trucks and coal carriers slip into ditches, skid and rattle in the potholes. According to the plan, the road should be concrete in many places.

What does the Ministry of the Coal Industry hope for by weighing the fate of the muliple-million facilities on a temporary road, on a living line of connected network of roads and power supply? Are they really relying on the factthat new powerful equipment will last for a year or two, and then they will be given new equipment, there is nowhere to escape! But we already know that industry is lagging with shipments of new machines, and the old are already losing up to 30 percent productivity merely because of poor roads.

We add that last year each dump truck spent 98 days waiting for repair and preventive maintenance, and this year there are considerably more delays, there is intensive wear. When I was in Neryungri, the average daily output of dump trunks on the road was 28, this is of the over 100 trucks if you count the coal carriers.

Even now the drilling machines, bulldozers and even some of the excavators require major repair. The line of waiting machines will increase with each month. The repair-mechanical shop does not exist in the plan and is not expected. Its first phase should have been started in 1983, but it will not even be in 1984 because one-tenth of the resources have been allocated for these purposes, and that is next year. A total of R 70 million have already been spent on the enrichment plant, in more prestigious facilities which will become the landmark of poor management if the output of the plant of the quarry is not brought to 13 million T of coal by 1985.

Construction methods that were long ago condemned by experience are nevertheless amazingly resilient: in reducing the start-up complex, in devotion to temporary plans. And this occurs with today's space technology which has been concentrated in Neryungri as nowhere else in the world. This results in the fact that still comparatively recently, the successful facility, the open pit, was driven into a corner which put the entire complex into a difficult position.

I asked the people of Neryungri of different service ranks and different service records what they thought the reasons for the confusion at the construction sites of the complex were. They told me that there is no master at the territorial-production complex and this is the problem. One of the speakers answered the question with a question: What response did the article "Neryungri Tomorrow" which was published in STROITEL'NAYA

GAZETA on 25 November of last year receive ? I told him everything that I thought was useful to know, that the member of the board of the USSR GOSPLAN, head of the department of the territorial planning V. Negrutsa did not delay in answering them and reported that at the South Yakutsk territorial-production complex a coordination council had been set up headed by the first deputy minister of the USSR coal industry M. Shchadov.

A sufficient time has passed for the council to justify itself. But the situation at the complex continues to noticeably deteriorate. The unified opinion of all the participants of the construction site (with the exception of one) is that the coordination council is like the Queen of England, she reigns but does not rule. Sometimes the deputy ministers of the interested departments assemble together but in order to quarrel with each other.

"How can it be otherwise?" The Neryungri residents of different ranks and years asked me. "Is it not obvious to the Ministry of the Coal Industry what is needed for the complex in the first place, and what is needed in the second place, can it really not dictate its will and determine the policy of other ministries? Of course it cannot if only because no one has given it this authority. And this is because the ministry placed at the head inevitably will place its departmental interest to the detriment of the other participants. **This is no accident that the Ministry of the Coal Industry is against the decisions of a new manager. And you've seen how it manages itself."**

These are the arguments . Are they serious and substantiated enough? I tried to investigate this. What happened will be discussed in the next letter.

Administrative Separateness Causes Problems

Moscow STROITEL'NAYA GAZETA in Russian 17 Sep 82 p 2

[Article by V. Antonov, our special correspondent: "3. Around the Problem"]

[Text] Thus, they believe in Neryungri that the coordination council headed by the USSR Ministry of the Coal Industry is not coping with its commitments. How can this be?

I ask for a reception in the department of territorial planning of the USSR Gosplan for which I am sent to the subdepartment of the east, directly occupied by the South Yakutsk territorial-production complex. I tell the chief specialist Yu. Terent'yev about the situation at the complex. He knows better than I. Nevertheless he considers that it is necessary to increase the effectiveness of the already created coordination council.

By the way, as I understood from the conversation, the department has more important concerns with the South Yakutsk territorital-administration. For example, it turns out that a program of development has not yet been drawn up for this most important economic region. How can the ministries find a common line of action in a region if the Gosplan does not yet have this line? It is not only a matter of lack of agreement of the already acting department in the TPK (territorial-production complex). New smaller, if not larger problems await those who inevitably come here before long, but now they prefer to look at the complex from afar.

I have already named the sectors of the production which in the near future should start up in the TPK, in the first letter from Neryungri. I recall that metallurgist, chemist and construction materials worker are waiting for work here. But they are not here, and who will develop the infrastructure for them?

By the way, one can understand the new customer of construction in the region. Why should they fly into this kray which is very difficult to develop if it is not yet perfectly clear how soon a plan and finished product will be required of them? Even if fate is defined in general features, one does not have precise schedules confirmed by law. It can happen that after setting up house, an uncle from another department will live in it forever.

Of course, the program for the TPK is the first concern in the department of territorial planning. It has not yet been made because they were occupied with something more important, for the entire Far East. Now they are occupied with the same for the zone of BAM, where the program of the South Yatusk TPK should become a component part. But the problem is not one of the easiest, in any case it takes more than a year.

"We are now hoping that a plan will be developed for creating a production base of construction organizations. This needs to be done before the program, as fast as possible, immediately; I feel what my companion Yu. Terent'yev is undergoing for the entrusted work.

"What is interfering?"

"Departmental separateness of the ministries," Yuriy Pavlovich gestures helplessly.

It turned out that this is not only the ministries, but also the sector departments of the USSR Gosplan. In the subdepartment of the east, they only found out from me that their neighbor, the Department of Power Engineering has already decided the fate of the first phase of the Neryungri GRES, and has agreed to put off the periods of its construction for another year.

"This cannot be, this cannot be allowed!" Yuriy Pavlovich did not believe it.

Now I gesture helplessly.

By the way, the Department of Power Engineering, as I found out, also followed very narrow goals, only the construction of the power plants, and everything that accompanies, except housing and social-cultural-general services. Another department is occupied with this. Is this not why the facilities of city construction in the South Yakutsk TPK are now drastically behind already created industrial potential and heavy weights hang on workers' hands?

It is no longer the time to separate daily life from production, to consciously sacrifice the first for the second. It has always been proven that this self-sacrifice is economically unprofitable. One of the proofs of this thesis is the experience of the Nadezhdinskiy metallurigical plant. According to the calculations of the economists, the general complex built there with all types of services yielded an increase in labor productivity of at least 20 percent. It is thus still a question of what determines the success of developing facilities. In any case, the experience of Nadezhdy makes it possible to think that comfortable daily conditions in an uncomfortable natural environment are definitive.

Leonid Il'ich Brezhnev spoke about this at the 26th Party Congress. Let us say that a man leaves Siberia most often not because he does not like the climate or his wages are low, but because it is more difficult to obtain housing there, to put his child in the kindergarten, and there are few cultural centers. This is why, Leonid Il'ich continues, we are planning in this five-year plan to construct housing and the entire social-cultural complex at higher rates in these regions. The situation has to be changed and in the near future.

In Neryungri I became acquainted with the brigade of housing construction headed by L. Platonov. The very strong family-like collective has been working for a long time and has built a lot. But they miscalculated one or two times in Neryungri with the collectives. The turnover of personnel upsets construction both in the city and in the industrial zone. Neither the high coefficient 1.7, nor the annual northern bonuses keep the workers from leaving.

But look at what a significant and characteristic phenomenon occured here recently. Turnover of personnel before last year was high for the coal miners and builders. Starting last year it drastically dropped. What happened? A plant of large-panel house construction was put into operation, and the hope appeared that soon the people would receive apartments, they could put their children in kindergarten and nursery schools, and go to the movies. Let's hope that our prospects won't be betrayed!

The living conditions in Neryungri have still not improved. It is enough to say that the power engineers now have a line of 2,707 waiting for housing, 1,670 children waiting for kindergarten and nursery schools and the schools are overloaded. This is the same situation as in other subdivisions. The start-up of the plant of large-panel house building is not the solution to the problem, but only a prerequisite for the solution.

Now let us pass from the general to the particular. In the brigade of Platonov alone there were 16 weddings. At the same time the most necessary items for the newborns, the simplest baby vests are not to be found in the city. Fruits and vegetables do not grow in the permafrost, yet are imported with delays. According to the initial plan, it's about time to start developing an in-house powerful auxiliary service of livestock farms and poultry plant, greenhouses and dairy farms. There is special permission of the government to erect in Neryungri palaces of culture and other entertainment and sports structures.

The ministries crossed out these facilities from the title lists! They built the plant of large-panel house construction, what more do they need?

Why did all of this occur and who today is sincerely interested in the South Yakutsk TPK, who is ready to answer for it not in part, but for the whole business? No one. There is an interested party, these are the local party and soviet agencies, in particular Neryungri party gorkom. But it is not the customer of the construction, national ministries are. Who will turn them face to face and make them concerned about comprehensive development of the region?

After the visit to the department of territorial planning and other departments of the USSR Gosplan, I understood the correctness and the concern of the builders of the South Yakutsk TPK. Who will attract here the ministries of ferrous metallurgy, petrochemical industry, construction materials industry, republic and union, other ministries and departments who should have taken the most active part long ago in the development here of a production base of construction, one not scattered, but one common for all?

Having collected opinions in Neryungri and in Moscow, one can propose the following plan. We assume that at each complex (for we soon will have a lot of them; there are quite a few already) can have its own coordination center made of specialists who are independent of a certain shareholder who will be directly responsible to the coordination council or a single commission of a group of complexes. The form may be different, but the essence must remain unchanged. The center, council or commission of the complex or groups of complexes must have the right to influence not only the ministries but also the Gosplan, and to achieve comprehensive financing and formation of complexes.

It is necessary to solve the question of a single reliable master in some way or another. It may be expedient to make the attempt to find a single master precisely at the South Yakutsk TPK, this first jewel in the valuable necklace of the Baykal-Amur Trunkline. Around it (after the Urals, Donbass and Kuzbass) according to predictions, a fourth construction-industrial base of the country will be developed.

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GENERAL

PROBLEMS OF LIVING, WORKING IN NERYUNGRI AIRED

Moscow TRUD in Russian 19 Sep 82 p 2

[Article by A. Kurbatov, special TRUDA correspondent: "Neryungri--A Northern City"]

[Text] How are cities born?

"Very simply, they joke in Yakutiya. We cut the first pine, cut it up into souvenirs and begin to build the city."

This is about Neryungri, about a city which began its history 7 years ago. Now we look at the map. South Yakutiya. This is a zone of permafrost. The sparsely populated regions at an altitude of 900 meters above sea level consist of low to the ground, thick northern taiga. In winter it's minus 50 here, in summer plus 30. To the south is the route of the Baykal-Amur Trunkline. At Tynda--a turn from it 90° to the north. Why were the builders required to extend the road through the Amur Oblast to Yakutiya more than 400 km?

The answer is known: there is the South Yakutsk territorial-production complex. In the Basic Directions for Economic and Social Development of the USSR for 1981-1985 and for the period to 1990, it was discussed as follows: "Continue formation of the South Yakutsk territorial production complex, complete construction of the coal mine, enrichment plant and the first phase of the Neryungri GRES. Develop technical and economic foundation for developing the iron ore field in south Yakutiya." This complex is the first in the BAM zone, but not the last, there will be more than a dozen of them. Everything that happens here today is especially important for us to know about: it will prove useful in the near future. But let us say several words about the first-born. It is enormous, it is promising. Its territory is rich with coal, iron ore, mica,apatite, construction materials, and it even has its own sources of mineral water. The coking coal alone here will be enough for 100 years. The coal and ore create an excellent future for the development of ferrous metallurgy in the east of the country.

But the most important thing in Neryungri are the reserves of valuable coal. In 1979, the BAM workers who penetrated though the northern taiga and hills ahead of schedules put the railroad line Tynda-Berkakit into operation. They lengthened the 7-kilometer branch to the station Ugol'naya in the shortest time. This station was located essentially in the heart of the city. It was no accident builders hurried to link Neryungri with Bol'shaya Zemlya,

for the city was already extracting its first coal. The first echelon went, then the tenth. Since then the country has received about 5 million T of excellent, high-energy coal from Neryungri.

Coal in Neryungri is extracted by the open pit method. It had been acknowledged as the most economical for the local conditions. It is not easy to reach the coal, sometimes up to 300 meters of earth have to be removed. But the bed is also unusual.

"Imagine," says the first secretary of the Neryungri CPSU gorkom, I. P'yankov, "a layer with area of 6 by 4 kilometers, from 5 to 8 meters thick. It holds about 400 million T of coal. But this is only one of the many South Yakutsk coal fields."

Last year the open pit introduced facilities for coal extraction of 2.5 million T per year. In 1982 the second phase of the open pit with the same output will be started up. This is only the beginning. In 1985 it is planned to remove 13 million T of coal per year from the open pit. The tasks are complicated. The work to be done is difficult.

The work pace over the entire open pit is increasing. But let us return to the city of Neryungri and follow its streets. We reach the place were the first pine was cut. Souvenirs have been made out of it and they decorate the well-built apartments of the first comers. At this place there is a small wooden house, the first museum of the young city.

Arround there are modern houses. It is natural that they have a full set of communal conveniences. Among them are houses assembled from imported parts. They cost the Neryungri residents a lot. But near by are blocks of houses made of panels of the local plant.

These advances are pleasing. They are doubly pleasing since they are associated with correction of serious miscalculations allowed in the creation of the first territorial-production complex in the zone of BAM. They advanced at a rapid pace to the coal and considered the problems of housing and daily life to be secondary.

The secretary of the territorial committee of the trade union of coal industry workers V. Zharkov told me:

"There are 5,000 people waiting for individual apartments. We have a shortage of 1,500 places in the kindergartens, this summer 870 children will vacation in the pioneer camps, and there are over 2,000 who are interested.

They reach the coal, they are extracting it, but the turnover of personnel at the construction site has passed 40 percent and has a painful effect on the planned indicators. When the large house-panel plant was constructed and houses began to rise up in the city like mushrooms, this percentage dropped to 11. The difference in the numbers convincingly proves that concern for people is a decisive factor.

But in July I visited one representative conference where the head of the combine "Yakutuglestroy" V. Bocharov criticized the RSFSR Ministry of Trade for poor supply and the meager assortment of goods in the city shops.

"We build houses, we deliver them but we do not have any furniture. It is not imported," he said indignantly. In the break I went up to the deputy minister of trade of the RSFSR, N. Konovalov and asked him to comment on this sad fact. Representatives of the Neryungri Administration of Worker Supply and V. Bocharov participated in the conversation.

This was a strange conversation. It happened that Bocharov was against... Bocharov. But let us give the floor to the deputy minister of trade of the RSFSR N. Konovalov:

"We are prepared to import furniture into Neryungri even now. But deliver it where? Where are the stores, warehouses and bases?"

I note that all of these objects are being built by the combine "Yakutuglestroy." What happens? The builders criticize trade for poor work, and they themselves cannot create the normal conditions for it. Of the 4 started cafeterias for 370 places, only one has been completed, for 80 places, of the 6 stores, 3, and construction of the bread plant has been delayed. The 3 potato warehouses which a decision of the office of the party gorkom obliged the combine "Yakutuglestroy" to build by winter have not yet been constructed.

"And they will not be!" laments V. Bocharov. "Because they are not to be found in the state plan. And you," he advised the head of the administration of workers supply Butakov, "need to act more actively in order to form the plans and to do your work."

What can be said? When the state plan is formed at the site, there are generally no disagreements: everyone understands that the city is in great need of both cafeterias, stores and warehouses. Everyone is an ally here, and everybody thinks about one thing. Only when the business reaches the approval of plans in the USSR Ministry of the Coal Industry are the objects of social-cultural and general purpose often excluded from the plans.

Thus it happened for example, that quite recently the plans were approved in the ministry for 1983. Countrymen and people with the same viewpoint sat with Bocharov and the representative of the administration of workers supply Kalashnikov in the office of the deputy minister A. Pshenichniy. But when the requests of representative of trade were rejected one after another, the head of the combine "Yakutuglestroy" V. Bocharov could not at all help his comrade. Interdepartmental separation! Each ministry has its own central boards.

This example is characteristic for other organizations of the construction site as well. It is bad when the volumes, tons, cubic meters and kilometers are in the forefront, and concern for the working people is in the background.

Construction of the coal complex has been divided into stages. Each year it is necessary to reach new limits. The construction site requires and will require more good specialist Now, for example, for successful development of the mining operation in the open pit "Neryungrinskiy" the

association "Yakutugol'" requires 125 experienced machine operators. It is a simple question where to invite them from: other associations of the sector will help. But what will greet them in Yakutiya?

This means that the volumes of construction of houses, and social-cultural-general objects must also rise. It would be good to also take into consideration in this case the old debts of the builders. For example, in the first years of birth of the complex, the operators were constantly lacking apartments. Perhaps someone assumed that their turn would come soon? They erred. And the list grew. The housing supply for this category of workers is one of the lowest in Neryungri. The builders must take into consideration the fact that the avarage age of the residents of the young city is 26. Many of them have already settled down with families, fallen in love with the kray and are ready to settle here forever. But what will keep them in Yakutiya?

This is what I wrote, for example, in my notebook: "Seventeen clubs in Neryungri. Over 4,000 people are involved in 129 different creative circles." A lot? Probably not very. There are about 90,000 people in the city. There is an athletic hall here. There is only one, working from 08:00 to 24:00. This is not very much even for a small settlement.

In one new microregion of Neryungri I could not help but pay attention to the well-proportioned pine groves. No matter what the work pace or the plan, the Neryungri residents must also think about the future. Heavy panel carriers, cranes, and bulldozers have tried not to damage the beautiful nature of the north. This fact seemed symbolic to me. People have come here for a long time. The start-up of the complex depends on them. It's an unusual, powerful complex, the first in the BAM zone, but not the last. Here a city is not easily started. Here experience is formed which in the near future others will need. How can you forget that the most important condition for normal development of work (this was stressed at the 26th Party Congress) is the well-thought out organization of the preparatory period, priority construction of housing for workers and their families, preschool institutions, schools, stores, cafeterias and other cultural-general purpose and communal sites.

Any construction site begins with the foundation. And this foundation is its production base, an unblemished rear guard and concern for the working people.

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GENERAL

NEW CITIES DEVELOP ALONG GAS PIPELINE ROUTE

Moscow PRAVDA in Russian 14 Oct 82 p 1

[Article by A. Shiryayev, outside PRAVDA correspondent: "Forest Cities"]

[Text] The route of the future gas river Urengoy-Western boundary extends almost 200 km on the territory of Mordoviya. It intersects the autonomous republic from the northeast to the southwest and emerges at a point where the Penza, Ryazan and Tambov Oblasts converge.

Not far from the railroad station of Uzhovka, Torbeyevo, Vubova Polyana, Vysha and Svezhen'kaya, base and watch cities of the gas workers have grown up on the forest edges like mushrooms from under the ground. Some have already adopted a proper appearance, and the people are living there with enviable comfort. Others are being built, and here the new settlers have to overcome temporary inconviences. Everywhere the collectives are rapidly becoming accustomed to their work. Four large subdivisions included in the Main Administration for Pipeline Construction of the Ministry of Construction of Oil and Gas Industry Enterprises have evolved active work on the section set aside, constructing the first line of the export trunkline and striving to fulfill the socialist commitments adopted in honor of the 60th anniversary of formation of the USSR. The majority of workers and commanders of production came here after completion of construction of the route Urengoy-Novopskov.

The sandy road in the forest brought us to the very edge of the Mordov land, to the settlement of Vysha, where the collective from the trust "Bryansktruboprovodstroy" set up its city. Comprehensive production lines were recently created in which the forces of excavators, transportation workers, welders, insulators and pipe layers were merged into one.

The head of the line here in Vysha is the comparatively young engineer A. Devyatkin.

"In Mordoviya and beyond its limits," he relates, "we have to build 71 kilometers of route. Everywhere there are forest and swamp. There are no more sections like this in Main Administration for Pipeline Construction. Practically every 3 meters we have to fasten to the pipe reinforced concrete weights, or install anchor attachments. Otherwise the pipe 'floats' to the surface of the marsh."

The line leader named some people who have succeeded in distinguishing themselves in the new place. The brigade foreman of welders I.Morokin, bulldozer operator N. Bekhovskiy, pipe layer machine operator I. Boltinov are working well.

The advantages of the line organization of labor are obvious. On the section, and not only here, there are no subdivisions separated by departmental interest, there is no division into "yours" and "mine." Everything has become common, interrelated, and interdependent. Cases where, say, welding of pipes into lengths is behind schedule and holds up the work of the transportation workers, or when the truck drivers have problems with the brigade foreman of welders are simply impossible here.

The route lives an uninterrupted life with all of its joys, concerns and fears. One becomes convinced of this after visiting Zubova Polyana, the regional center in the west of Mordoviya. Located here is the headquarters of the first construction region, one of the two formed in the European sector of the route of the transcontinental gas pipeline (the headquarters of the second region is located in Zolotonosha in the Cherkassa Oblast). The head of the headquarters in Zubova Polyana, D. Nadot and a member of the headquarters V. Grishayankov (he is the head of the department of personnel of the central board) are always staying aware of all work and events occurring on the 780-kilometer section set aside for this region. Vast and detailed information flows together here, permitting rapid solutions to be made if necessary. The link with the production line and the higher organizations, with the local party and soviet agencies is constant and very close.

In Zubova Polyana, a city of gas builders is also rising. In a bright grove where, by the way, not a single tree has been cut, vast buildings of a cafeteria and movie-concert hall, and sports complex have risen.

"Here we have," D. Nadot points at the long row of 'barrel-houses', "the Gasbuilders' street. Nearby there are other streets. They still do not have any names, the future new settlers will think them up."

That's true -- there will be new cities and new streets. And most important there will be a new powerful gas trunkline which reliable and strong people are building.

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GENERAL

LIFE, WORK IN KOGOLYM DESCRIBED

Vilnius SOVETSKAYA LITVA in Russian 14 Sep 82 p 2

[Article by A. Solarev, special correspondent of SOVETSKAYA LITVA: "Then This Will Be Called a Heroic Deed "]

[Text] "Extraction of gas and oil in West Siberia, and their transporting to the European sector of the country should be made the most important links in the energy program of the 11th, yes and even the 12th Five-Year Plans."

(From the accountability report of the CPSU Central Committee to the 26th CPSU Congress).

From the height of a bird's flight, that part of the Tyumen Oblast where the forest-tundra begins is similar to a patchwork quilt since there are so many intersecting swamps, lakes, rivers and small pieces of dry land. At times it even seems that under the helicopter there is an ocean with tiny islands. Precisely here, in these areas which are difficult to reach for man, nature has hidden its treasures, oil and gas. People have come to the swamps in order to take these treasures: they lay down roads, build boreholes and pipelines and construct cities.

The entire country is participating in the development of West Siberia. People from all the faternal nations armed with the most modern equipment are working here shoulder to shoulder.

Six years age, 150 kilometers from Surgut, the settlement of Kogolym appeared which grew up from a railroad station. Translated from the language of the local residents, Khanty and Mansi, Kogolym means "god-forsaken place." Then it was such a place, a small sandy island among swamps, in addition cut by streams and rivers. Around it in all directions at a depth of 3 kilometers there were reserves of oil so needed by the country.

Now drillers, oil and gas extracters, road workers and builders live in Kogolym. I would like to talk about those who conquer the oil and gas virgin land of West Siberia.

Explorers of the Depths.

It is not far, only 70 kilometers from Kogolym to the Povkhskiy oil field. One is barely able to admire the landscape of the tundra forest from the helicopter before an orange tongue, the gas flame of the field begins to slowly float into the round screen of the window. This is the "property" of the Mirnenskiy administration of drilling operations (ADO) "Kuybyshevneftekhimzavody" of the production association. The workers of the administration follow the geologist: they develop the wells, and cause the influx of oil. After them come the builders, they extend the pipelines and are involved in finishing work. Only then do the oilmen appear at the field; they install the pump jacks and then unaided by man, the oil is lifted from the depth, travels on the local pipelines to the settling tank, and from there goes to the main oil pipelines in order to be converted at the plants into the most valuable products for the national economy. The drillers lay the foundation for this. The entire future fate of the field depends on how they work the wells which were discovered by the explorers of the depths.

The annual volume of work of the Mirnenskiy ADO is 640,000 meters of drilled wells. Now about 400 have already been drilled. There are record makers here. For example, brigade of drilling foreman P. Pakhomov last year drilled 50,000 meters, and in the country's anniversary year adopted the commitment to drill 5,000 meters more. The drillers are keeping their word, and it is not in vain that P. Pakhomov has been acknowledged as the best drilling foreman in the sector. There are many like him in the administration.

Take for example the brigade of the drilling foreman Vladimir Artemenko. Vladimir himself has been working here only two and half years after graduating from the Kuybyshev Polytechnical Institute, and the brigade which he heads has already become a collective of communist labor. We came to the borehole at a critical time: the next well, the second from this derrick was being predrilled. Now not one field well but several dozen are drilled from one derrick. In the Mirnenskiy ADO, for example, up to 30 wells are made from one cluster (i.e., with one borehole) traveling at an angle towards the surface of the earth. If even one vertical well is drilled, a difficult task, then what can you say about 30 inclined ones. But the brigade of Artemenko is not afraid of this. The people here are experienced, and understand each other from only a half word. Generally each shift has added 100 drilled meters to the personal account of the collective.

It is true that not everything goes smoothly at all times. The next steel pipe kept missing the thread of the string cased in the well. One, two, five attempts were not successful. From a height of 30 meters, the assistant driller A. Khrushchev sits on a narrow platform attached by a carbine to the derrick. He hears the swearing. The long pipe, the so-called stand, was straightened, bent in a bow, but could not catch the thread. Finally, another assistant driller V. Ivanov skillfully caught the end of the stand, driller P. Spiridonov pressed on the lever of the winch, the drum began to turn, the cable twisted the stand, and it successfully sat on the thread, and went rapidly downwards to the support. At a velocity of almost 20 meters per minute. Khrushchev was already attaching a cable to the next stand; Ivanov, with the help of a guy line brought it to the well. Work continued without interruptions.

Artemenko smiled, and put his helmet on the back of his head:

"It gets stubborn when guests are here. It wanted to show off its will. But our wills are stronger."

The brigade of Artemenko is working the 16th well on the Tyumen land. Over a dozen of them are already producing oil. Pumpjacks stand on them, somewhat similar to cranes, and rhythmically rocking their "head" extract from the earth the most valuable raw material. They are now firmly ensconced in the landscape of the forest-tundra. When we stopped on the way back at one of them, I attempted to imagine a time quite recently when dreaming about oil and gas, the geologists penetrated the Tyumen swamps in summer and winter, sat on the shores of rivers, and set up winter roads. At that time there was not a single borehole, not to mention pumpjacks. But it was difficult to imagine this. Now it seems that the boreholes have always been here, since they reliably and naturally have been ensconced in the local landscape.

First Comers

The most important figure in West Siberia for the ignorant man is the oil and gas extracter. The oil workers themselves perhaps think that the road workers are. If there are no roads you cannot reach either the borehole or the fuel at the field, and you cannot lay pipelines. Without the roads one can only travel here on winter roads when the swamps freeze over all the way to the bottom. If it melts a little, everything -- transport of any type is laid up. A lot of shipments have to be made to the new fields. The economists have calculated that at the new field every meter made into the depths has to be provided with roughly a ton of cargo: all the drilling machines, pipes, cement, trailers, chemical reagents, all of this is included in this ton which seems to embody what is called industrial development. You cannot ship so much by air or by winter road.

That's why, as if from a base from which an attack is made, concrete roads extend from Kogolym. They are used to carry out an attack on new undeveloped fields.

Among those who are laying these concrete roads in the areas where no man has been is the collective of the road-construction administration No 12 in the Tyumen Oblast of the road-construction trust of the Lithuanian Ministry of Automobile Transportation and Highways. On 26 July 1980, a group with road and construction equipment, precast houses and materials arrived at the railroad station of Kogolymskaya. The DSU-12 counts its history from this day. It is already being written by the amateur students of local lore among its workers. The "landing parties" spent the first days in small houses, without unloading them from the platforms: there was no time. Construction of the saw frame and a small bank were started immediately. Only when the saw frame began to work did they start the housing, because construction materials were now supplied.

From the story of the foreman Al'gis Matulenis:

"We were given a place for the city on the outskirts of the settlement. There was no road to here from the station. We had to make roads and housing in addition to construction. Everyone worked equally without worrying about positions. Before winter it was necessary to prepare everything for the

arrival of the main forces. At times we were afraid even to sit down in order to take a smoke; we immediately fell asleep. Before winter we succeeded in even making a central heating station and building a boiler house. So we had no need for the 'burzhuyka' [small stove].

Before the onset of the first frosts the "landing parties" succeeded in preparing the base. But they did not succeed in heating the pre-assembled-panelboard, or as they are called here, 'free assembled-slit' houses. They were not adapted for the severe Siberian frost. Therefore everything in them 'froze through and through'. But the majority of people understood these difficulties and did not complain, and after work labored on the heating."

From the story of the foreman Vladimir Vizhbukh;

"Anything was possible at that time. Once in the evening we were told; in the morning an airplane will come with people. We did not even have roofs on the barracks. What to do? They announced an all hands job at night. By morning the roof was ready, and the people immediately received warm housing. Dissatisfied? Of course they were. But they did not stay here for long. Siberia does not love the weak. The others were only united by such jobs.

Last year the collective of DSU-12 began to fulfill its direct task, to build the road to the Kogolym field, and at the same time constructed a railroad siding, cafeteria, new large bath, kindergarten and a mass of other facilities of both production and social-cultural-general purpose."

From the story of the head of DSU Antanas Yankauskas:

"No one was experienced in building these roads. In our republic they do not build these concrete roads. We began, from nothing, and we gained experience with time. First of all it was necessary to measure off the route. This means that it was necessary to lay a sand road, an even road from 1.5 to 2 meters high. At each kilometer of this route it was necessary to have 40,000 m^3 of sand. The KrAZ takes 8 cubic meters. From 10 to 15 trips were made in a shift. It is easy to calculate how many trips had to be made in order to make 1 kilometer. Then the concrete slabs were laid, welded at the butt-joints, the seams were poured with bitumen, and the road was ready."

It generally seemed comparatively easy in the story of Yankauskas. Listening to him, it seemed at times that 20 kilometers of the already completed concrete road appeared here comparatively simply, without special efforts.

But when we became aquainted more closely with the conditions under which construction is occurring, we understand that the head of the DSU simply was being modest. Try to lay out a road through a lake, whose depth is up to 2 meters, and whose width is just more than a kilometer. Try to work in 30-degree heat in mosquito veil, when swarms of midges hang about in a thick cloud, or in a 50-degree frost when the birds freeze on the wing. And there are other difficulties.

When you find out about all of this, then you see the work of the Lithuanian road workers in quite a different light. It is excellent work. It was pleasant to learn that it received a high evaluation at both the sector congress of the trade union, and at the scientific-practical conference in Tyumen, where theoreticians and practioners of road construction from the entire country gathered.

But the collective does not live by work alone. A lot of attention is focused on the daily life of the workers. The cafeteria here is not inferior to many in Vilnius, next to the kindergarten the skilled craftsmen have built swings, and a wooden train and a mass of other amusements. Next to many houses there are small fenced sections where flowers are growing. This -- in conditions where grass rarely grows.

It is no accident that in the first days simultaneous construction of saw frames and bath-houses, as already indicated above. Concern for the results of work here is constantly combined with concern for the conditions of this work. This is probably the main reason for all the success of the road workers.

Today they are faced with putting into operation another 3 dozen kilometers of concrete road which the oil workers are waiting for in order to start development of a new field.

A City Grows in the Taiga

The city of oil workers Kogolym grew up several kilometers from the railroad station of Kogolymskaya. Within several years its population should exceed 100,000 people. There are already over a dozen modern five-story houses, the same which can found in any city of the country. Even one nine-story building proudly rises among them. There are all the conviences in the house that the city dweller has become accustomed to: electric hotplates, hot water, sewage. Only the houses themselves differ a bit from their brothers that are in the European sector of the country. The panels of which they were installed are insulated with a thick layer of mineral wool, and instead of two pieces of glass in the window frames there are three. Even the front porches glisten with glass, they have been converted into verandas. At the entrance there is a triple lobby and the basement rooms have been considerably insulated. In the rooms there is double the number of radiators. Even special, frost-resistant steel is used for the construction. In a word, everything is done so that in the most severe Tyumen cold which reaches more than 50 degrees, the apartments are warm. Workers from three Baltic republics, Latvia, Estonia and Lithuania are building the new city. Our republic is worthily represented here by the construction-installation train (CIT) of the Kaunass house building combine in the Tyumen Oblast which is headed by the former builder of the Ignalin AES A. Kurilov.

The first builders, 36 people, arrived here on 23 October 1980. Meanwhile, remodeling of production was taking place in Kaunass in anticipation of the Tyumen orders. The designers completed creation of houses of a new design; developed fittings for shipping reinforced concrete panels on the railroad. No more and no less than 800 tons was required. A special loading platform was constructed for loading the cars, the shop for production of panels was reconstructed. In a word, a lot of organizational and preparatory work was done.

The first panel was installed in Kogolym on 23 June of the next year. On the eve of the 64th anniversary of the Great October, the state commission received the first five-story house of the Kaunass workers with a good evaluation. This was the first house with all the conviences in the future city.

Now it does not stand out at all among its brothers that were raised after it; all constructed by the Lithuanians, and the builders of Latvia and Estonia. The workers of CIT have a secret dream, to install on it a plaque so that their descendants would know where the city of the oil workers began.

It is not easy to build a city among swamps. First, there were no concrete roads from the station to the city and the panel-carriers almost got stuck up to the top of their wheels in the deep sand. It took several hours to cover this distance. But the difficulties only urged on the builders, there have not been many cases where they did not fulfill the monthly, quarterly, and even more the annual plan.

The CIT is made up of 240 people. This, generally small collective does a lot of work. Here are some lines from the commitments adopted for this year: "fulfill the annual plan for the volume of construction-installation work by the 15 December; overfulfill it by R 150,000; increase labor productivity by 1.5 percent; finish all the facilities with a 'good' evaluation." Here are the results of the work in the second quarter: "volume of construction-installation work exceeded the plan by 7 percent; the volume of construction-comercial products by 28; labor productivity rose by 2.3 percent."

When I was in Kogolym, the builders were ending work on the next house. Here the finishers were in charge; the installers had gone to other units. The carpenters of the brigade of V. Tikhonov and painters who are led by A. Shevchenko work quickly with high quality. Only 3 apartments remain to be finished. The carpenters A. Garnis and V. Korolev hung the doors, adjusted the window frames. The brushes glistening in the hands of the painters G. Mukhletskene and E. Bauzhene left behind them evenly painted walls of the kitchen.

Now almost 400 families of the workers of the oil and gas extracting administration "Povkhneft'" live in houses built by the Kaunass workers. New and more complicated tasks are ahead of the builders. Of course they will cope with them.

A new city of Kogolym is growing among the swamps, and those who will live in it will remember its creators many times over with a good word.

In Siberia they do not like fine words. Here they do not speak about heroic deeds. It is work. Difficult, intensive and important. Work necessary to this harsh land and to the motherland . The confident conquering of the richest depths occurs imperceptibly here day after day in the frozen and tempered existence through hopes and disappointments. That what descendants will call a heroic deed is occurring here.

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