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USSR Report

ENERGY

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3 August 1984

USSR REPORT

ENERGY

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OIL AND GAS

PLANT FOR FIXED, DEEP-WATER, DRILLING-PLATFORM CONSTRUCTION

Baku VYSHKA in Russian 11 Feb 84 p 3

[Article by Azerbaijan Information Agency correspondent V. Korsh: "An Island Is Born to the Shore" under the heading: "We Will Fulfill the Decisions of the 26th CPSU Congress"]

[Text] The document about putting into operation the first stage of the Baku plant for deep-water foundations has been signed.

The importance of this enterprise, whose construction was specified in the basic directions for the economic and social development of the country, is difficult to over-evaluate. The oilmen await the plant's production with impatience. The stationary platforms, with each of which wells can be sunk in water depths up to 200 meters, will assist the oilmen in the search for pools of oil on the continental shelf and will enable the rapid and efficient development of such deposits.

The heart of the enterprise, the main production building, is stretched out along the shore of the Caspian for 800 meters. Here, steel plates delivered to the plant will be transformed into parts for the future offshore islands. For this, welding and bending machines and other high productivity equipment of the French company ETPM have been installed.

The giant stationary platforms will be faced with supporting huge loads in the frequently stormy Caspian. That is why special requirements for the quality of raw materials and welding are imposed at the plant. Each steel plate delivered to the plant is carefully checked in a special laboratory fitted with X-ray equipment.

The collective of Construction Trust No. 7 of Minpromstroy [Ministry of Industrial Construction], for the first time, has begun to work according to the method of independent brigade accountability in the construction of the main production building. Among the first to change over to the progressive organization of labor was A. Efendiyev's brigade.

"Work on a single order" says the brigade leader, "helped us to avoid idleness, and made our work more straightforward and rhythmic. The builders of our brigade, mastering related trades, have applied the method of the through production chain. Concrete layers, reinforcing rod workers, and carpenters have prepared the work front for one another in timely fashion and, if required, have been able to help their neighbors along the site."

Parts for the offshore islands will be delivered from the main production building to an erection area. The principal equipment here are lifting cranes. With their assistance, the installers will assemble platforms beginning with pipe subassemblies. Then, from the subassemblies, they will assemble the finished platforms. They will begin their life at sea in the plant's inner harbor. Two rock jetties reliably shut it off from the restless Caspian, and dredges have run a channel between them so that barges carrying the unusual load - the steel islands - can freely go out to the open sea.

Construction of the plant is continuing. Before the end of the Five-Year Plan, it is planned to start its second stage, and then the plant will produce 60,000 tons of metal structures annually. While here in Karadag the main responsibility of the builders is the main production building, not far away in Primorsk, subdivisions of Glavbakstroy [Main Baku Construction Administration] are building the residential town for the workers of the enterprise. Already finished are three nine-story and four five-story apartment buildings, homes for more than 400.

"And it is all very important" says the plant director T. M. Mamedov, "that the towns, where many social and domestic facilities are planned, be built a little bit more rapidly. After all, the mood, in many respects, depends on living conditions, and so also the efficiency of the work of the hands of those who will build steel islands for the oilmen."

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OIL AND GAS

WINTER STORM ON NEFTYANYYE KAMNI

Moscow SOTSIALISTICHESKAYA INDUSTRIYA in Russian 28 Mar 84 p 2

[Article by G, Ol'gin: "Defiance of Storms"]

[Text] Neftyaniiye Kamni - Never has there been so severe a winter on Neftyaniiye Kamni. But all the stormy days did not deter the personnel of the Association imeni 22nd CPSU Congress who were first among Azerbaijan oilmen to fulfill quarterly obligations, extracting more than 11,000 tons of fuel above the plan.

Exactly at one o'clock at night the disturbing bell rang in the study of Kerim Kerimov, chief engineer of the Association. They were calling from the separation station at the Gryazevaya Sopka deposit. A sharp jump in the pressure in the petroleum collector indicated that the oil, having become thick in the cold, had stuck in the pipes. Kerimov did not sleep since, when on duty in storms, one cannot close one's eyes. So, slipping on an overcoat, he went out to the car.

Operator Nina Komarova already awaited him. She explained that the sharp cold snap also had hurt the oil separation from the petroleum gas. On the spot it was decided to increase the dosing of the oil with chemical reagents to lower its viscosity. They spent a fair amount of time but the oil did not start to go along the pipeline. It was necessary to go to the village. In good weather the Uazik ran the distance in 20 minutes. But this time, almost double that was needed. The force of the wind threatened to overturn the light car. Upon arrival, there is a new message-- there on the Gryazevaya Sopka the waves had destroyed the supporting structure for the oil pipeline.

Exchanging the Uazik for a heavy oil carrier, Kerimov again departed for the oilfield with the chief of the third shop for the extraction of oil and gas, Tugay Aslanov. From the dispatcher's garage he communicated with the meteorologists. The forecast was not comforting. Wind gusts had reached 32 meters per second and were getting stronger with each hour.

They were too late. Not able to sustain its own weight, the oil pipeline, without support, broke. They made the only possible decision; namely, to close off the feeding of oil to the collector from the wells and put it into the spare underwater pipeline.

But at the installation there is a new predicament. The level ribbon of the trestle, swinging sharply left and right, fell down with a crash only a few meters from Kerimov. The road to the village was severed.

The night shift operators had arrived on time - M. Gamidov, G. Velibekov, N. Salimov, T. Gasonov, E. Mamedov, G. Chubakov, A. Abdulayev, and A. Rzayev. It had to be considered that help could not come. Neither boat nor helicopter could make its way here in such weather. They dispersed in groups to close the wells to stop the oil running out of the broken pipes. They went out holding on to each other and gripping the trestle guard rail so as not to be swept into the sea by the wind and waves. At 22:00 hours they again assembled at an oil collection point which is under construction where they took shelter from the wind for the night in the large operator's cabin. They brought in thick iron plates and lengths of pipe, they threw in boards torn from crates of equipment. With a series of matches they lighted a scrap of newspaper. A fire began to crackle, lighting up the first smiles on the tired faces. They cheered up completely when they saw that the provident Komarova had brought with her a teapot. And soon there was a glass with boiled water passing from hand to hand.

"Not for a long time have I drunk such tasty tea" joked the old operator, Gasan Velibekov. It was as if the silly joke had broken a dam of accumulated tension. Everyone began to talk, to move about, and laughter was heard. After midnight it calmed down. To save heat they lay down to sleep directly on the cabin floor closely pressed together.

From the experience of the past day, Kerimov could not sleep. Next to him on the bench sat Aslanov. They understood each other without a word - the wells cannot be left without observation for a long time. They left, tightly closing the door. The motor of the oil carrier roared and the light which blazed from the head lamps dissolved the snowy haze. At dawn they came across the drillers' house and finally revived their portable radio. They reported the latest news to the association and returned right away to the people.

"Kerim!" quietly called Alsanov to his companion. And when he reached the other, he pointed to the road along which in the night they had passed many times - there were no pilings under the girder, they were supported only by the weld joints.

Evening brought unexpected gladness. The personnel boat "Dzhalgan-8" brought the assistance of builders and repairers. Work began to bubble with new strength. Not one of the oilfield workers, although Kerimov did not insist on it, left the Neftyanyye Kamni.

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OIL AND GAS

PETROLEUM PRODUCT CONSERVATION URGED

Moscow SOVETSKAYA ROSSIYA in Russian 28 Mar 84 p 2

[Article by V. Ryabov, chief of VPO Soyuznefteorgsintez [All-Union Industrial Association for the Processing of Oil and Organic Synthesis Products] of the Ministry of the Petroleum Refining and Petrochemical Industry, and Ye. Radchenko, director of VNII [All-Union Scientific Research Institute] for Petroleum Refining: "Not Counting on Abundance" under the heading: "Economize Zealously"]

[Text] As specialists, we frequently have to participate in commissions checking up on the utilization of petroleum products in the national economy. Occasionally, on returning from an assignment we experience a sense of disappointment. The Association and the Institute expend much effort and funds on the development and introduction of high-quality kinds of fuel and lubricants, but our work frequently turns out to be in vain. Not only once or twice have we had to face the fact that costly motor oils are being discharged into reservoirs where low quality residues are stored. Agricultural equipment filled up with such a "cocktail" quickly breaks down. Because of this, we estimated that the operating life of K-700 tractors and KSK-100 combines is being reduced by almost a factor of two. And so much fuel is not being used as intended! So much of it is being sold on the side! So much industrial lubricating oil is being burned in boilers so as not to reduce the supply for the following year! Why are such things done? What must be done to put things right?

Over fifteen years, the demand for fuel and energy resources in the country has practically doubled. In order to keep up with the demand, the petroleum refining and petrochemical industry during this time has increased the output of products by a factor of three. Production has grown, basically, because of the growth in the amounts of raw petroleum being extracted. In recent years, however, the deliveries of petroleum to the refinery have stabilized. Moreover, its quality has changed at many deposits. As a matter of fact, this sometimes leads to a shortage of several kinds of fuel and lubricating materials.

There are two ways to resolve the shortage. The first is to increase the output of high-quality petroleum products. The second is to use them efficiently and economically. Speaking specifically about our own industrial

sector, since the beginning of the Five-Year Plan, the production of gasoline has grown by three percent, including a forty percent increase in the output of high-octane gasoline. There is more. The growth in the output of low-congelation grades of diesel fuel has exceeded the growth of the total output of diesel fuel twofold. The proportion of high-quality grades of lubricants has increased by a factor of more than two and a half. Nevertheless, for the present the total satisfaction of the demands of the national economy for fuels and lubricants is not successful. One of the main reasons is that these products are being irrationally consumed, and this is simply wasteful.

The profligate attitude toward petroleum products, to a large degree, is explained by the fact that rooted in the minds of the people is a perception that gasoline, lubricants, and diesel fuel are cheap and there is an abundance of them in the country. The following fact is persuasive that we are not exaggerating in this: over the past ten years the actual specific consumption of lubricants in agriculture has remained at one and the same level. In other words, in the village they do not think about the struggle to conserve petroleum products.

The supervisors of many departments do not take into account the technical improvements in machines and mechanisms, and the increases in the quality of fuel and lubricating substances. As usual, they are oriented to obsolete norms for the consumption of petroleum products. For the K-700 tractor, for instance, according to the approved normative for agriculture lubricating oil consumption for each engine is 2.8 percent of the fuel consumption. Meanwhile, the engineering specifications, which take into account the economic efficiency of the engine, say that this index should not exceed two percent. It turns out that every tractor above the standard consumes about 300 additional kilograms of lubricating oil over a year.

There are many similar examples in other sectors of the national economy. Unfortunately, the situation is not being changed successfully. Primarily it is because the norms for fuel consumption are not established by the makers of the new machines but by their users. In this, everyone proceeds from his own departmental interests. The more so, since the procedure for the development and approval of norms - the essence of the matter - has no objective state control. In some industrial sectors the norms are approved by the leaders of the ministry, in others, by directors of enterprises or the boards of the kolkhozes. But anyway, in the staff of an industrial sector or at an enterprise everyone would wish to preserve the overstatements of the norms for the consumption of fuel and lubricating materials. It is much easier to substantiate an unjustifiedly high consumption for petroleum products and not be concerned with conserving them. What is more, it is easier to use the appreciable surpluses in ways for which they were not intended. About 18 percent of the diesel fuel released to the kolkhozes and sovkhoses of the Kaliningrad oblast, especially for field operations, was used up in heating production and living spaces. Fuel at farms of the Kuybyshev, Ulyanovsk, and Saratov oblasts is treated precisely the same way.

The question about developing in the national economy a unified state system of normalization for the consumption of fuel and lubricating materials, which provides for a systematic reexamination of the departmental norms, is very urgent. As far back as 1982 the preparation of a proposal for development of a state system of normalization for the consumption of petroleum products was entrusted to USSR Gosplan, USSR Goskomnefteprodukt [State Committee for the Supply of Petroleum Products] and USSR Minneftekhimprom [Ministry of Petroleum Refining and Petrochemical Industry]. Two years have passed but there is no final solution so far.

Economy must begin with the design of new equipment. Here we have many unutilized resources. The engines of modern domestic T-150 and K-700 tractors and also trucks, even those produced with the State Mark of Quality, consume one and a half times as much lubricating oil as the best foreign models. A reduction of the loss of lubricating oil in motors by 20 percent would reduce its consumption by 300,000 tons per year.

We would like to draw the attention of motor vehicle designers to the same problem. For example, the "Volga" engine can operate on A-76 and AI-93 gasolines. In designing, however, the preference is given exclusively to the kind with the higher octane number and thence to lower specific fuel consumption. For every 100 km, 0.5 liter less of AI-93 gasoline is required than of A-76. But there is another calculation. The specific consumption of petroleum in the production of high-octane grades of gasoline is higher by far and exceeds manyfold the economy in operation. Our institute has completed a set of tests with gasolines having octane numbers of 90-91 which could be substitutes for the AI-93 used today in many cars and some trucks. A change-over to such gasoline - without design changes to the engine - would increase fuel reserves by almost three percent.

Reports showing the economic advantage of the use of such gasolines were transmitted to the State Commission on the Testing of Fuel, Lubricating Oil, Grease, and Special Liquids in USSR Gosstandart [State Committee for Standards]. It would seem that a decision would not be awaited for a long time. But, alas, one of the commission members, the first deputy minister of the motor vehicle industry, Ye. Bashindzhagyan, without significant reasons, refused to approve it, considering that the lowering of the octane number was inadvisable.

The problem of the competent use of petroleum products remains acute today. For instance, transformer oil having high physical, chemical and electrical insulating properties is mainly for power engineering. But, as checking shows, annually about 200,000 tons of the scarce product is used in the operation of machine tools and lifting and transporting machinery where they could manage with a less expensive kind. Only 30 percent of aviation oils are used as intended.

The problems of the use of petroleum products in various kinds of equipment, as a rule, have an interindustrial sector character. Precisely because of this, as long ago as 1981, USSR Minneftekhimprom and USSR Goskomnefteprodukt proposed the creation of an interdepartmental commission made up of repre-

sentatives of the ministries producing and distributing petroleum products and of the ministries developing and using equipment. The idea also received approval in USSR Gosplan and USSR Gosnab. Only the Ministry of Justice objected. In our opinion, this basically completely incorrect decision legitimatizes departmental separateness in matters of the use of fuel and lubricating materials.

Summing up what has been said, let us make a suggestion. Under the leadership of USSR Gosplan a revision of the obsolete standards should be organized in order to develop and approve scientifically grounded, rational norms for the consumption of all kinds of combustibles or fuel materials. They should become one of the main criteria in the evaluation of new machines and mechanisms.

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OIL AND GAS

OILFIELD EQUIPMENT DEVELOPMENT SPEEDED UP

Moscow PLANOVOYE KHOZYAYSTVO in Russian No 11, Nov 83 p 128

[Article by Z. Tsyryn, member of the board: "Minkhimmash Answers" under the heading: "Response to Our Statements"]

[Text] The Ministry of Chemical and Petroleum Machine Building [Minkhimmash] considered the questions raised in the article by the chairman of Gosplan of the Kazakh SSR, T. Mkhamed-Rakhimov entitled "The Economic and Social Development of the Kazakh SSR" published in the journal PLANOVOYE KHOZYAYSTVO (No. 5, 1983), and advises as follows.

At the present time measures are being taken by the ministry for the development, the manufacture of experimental models, and the mastery of the serial production of 14 of the named new kinds of corrosion resistant oil-field and drilling equipment for work in media having a hydrogen sulfide and carbon dioxide gas content of up to 6 to 25 percent.

Five of the indicated experimental models already have been manufactured for the Zhanazhol deposits, of which three are undergoing tests in the Aktyubinskneft PO [Aktyubinsk Oil Production Association], and two are undergoing plant and bench tests.

At the same time, for this deposit, preparation is being made for the serial production of the oilfield and drilling equipment in the 4th quarter of this year. The launching of it into production will be carried out in accordance with the results obtained from the industrial tests of the experimental models.

For the Tengiz deposit, serial production of nine of the named items of equipment has been specified for 1984. In the current year it is planned to conduct industrial tests (two of the named items of equipment have been shipped to the customer, and five are undergoing plant and bench tests).

The dates for the manufacture of experimental models of two of the items of equipment (the formation tester and the wellhead cut-off valve complex), because of changes by Minnefteprom [Ministry of the Petroleum Industry] in the original engineering specifications for their development, have been transferred to 1983 according to an agreement with the customer.

Delay in the manufacture of the experimental models of corrosion resistant equipment took place because of tardy deliveries of special kinds of materials and sets of articles by USSR Minchermet [Ministry of Ferrous Metallurgy] and USSR Minneftekhimprom [Ministry of Petroleum Refining and Petrochemical Industry].

The ministry has taken steps to accelerate the manufacture of the experimental models and the assimilation of the serial production of the indicated equipment.

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COAL

COAL INDUSTRY'S 1984 SOCIALIST COMMITMENTS LISTED

Moscow UGOL' in Russian No 4, Apr 84 pp 3-4

[Article: "Socialist Commitments of Associations, Enterprises, Construction Projects and Organizations of USSR Ministry of Coal Industry for 1984"]

[Text] Our economy is indebted to some extent for each of its great achievements to the creative initiatives of laboring collectives and to their own, as is said, counterplans. --From CPSU Central Committee General Secretary K. U. Chernenko's speech at the Extraordinary CPSU Central Committee Plenum of 13 February 1984.

Coal-industry workers, guided by the decisions of the 26th CPSU Congress and the December 1983 CPSU Central Committee Plenum, have actively included themselves in the socialist competition to fulfill the 1984 Plan and the 11th Five-Year Plan as a whole ahead of schedule.

In striving to make their own contribution to the further development of our motherland's fuel-and-power and defense capabilities, the workers of USSR Ministry of Coal Industry associations, enterprises, construction projects and organizations are adopting special counterplans and socialist commitments for 1984.

Insure the fulfillment of counterplans for raising labor productivity in the industry by about 1 percent and for reducing the prime cost of mining coal by 0.5 percent versus the established plans, based upon the more complete use of production capacity, equipment and worktime, the development and improvement of brigade forms of organization and pay, and a strengthening in every way possible of discipline and increase in the labor activeness of the industry's workers.

Satisfy more completely the national economy's rising demands for solid fuel. Mine 4 million tons of coal above the plan. In response to the Appeal of the Central Committee of the Communist Party of the Soviet Union to All Voters and Citizens of the Union of Soviet Socialist Republics in Honor of the Elections to the USSR Supreme Soviet, mine an additional 750,000 tons of coal during the first 2 months of the year.

Produce above the plan 760,000 tons of high-quality coal concentrate, including 400,000 tons for coking. Realize 37 million rubles' worth of output above the plan. Ship to consumers 2 million tons of coal above the plan. Build and put into operation capacity for mining 16.2 million tons of coal and for processing 10.5 million tons of coal, including the prescheduled introduction, respectively, of 1.75 million tons of coal-mining capacity at the Komsomol'skaya Underground Mine and the Pavlovskiy Strip Mine No 1 and of 1.5 million tons of coal-processing capacity at the coal preparation plant of the Nagol'chanskaya Underground Mine. Overfulfill the plan for sales of output by coal-machinebuilding plants by 3.6 million rubles, and insure the delivery of machines, equipment and spare parts in the prescribed quantities and products mix by the established deadlines. Manufacture 12 established series of underground-mine equipment and 22 varieties of test articles.

Provide for growth in consumer-goods output by 15.5 percent and produce 42 million rubles' worth of such output.

Constantly improve the technology and organization of production and work, and persistently introduce progressive coal-mining methods and the experience of advanced collectives.

Overfulfill established plans and insure that the mining of coal from faces equipped with integrated mechanization increases by at least 2.6 percent, the driving of mine workings by heading cutter-loaders by 6.4 percent, and the mining of coal by rotary excavators by 8 percent. Insure that strip mining produces at least 40 percent of all the coal mined and that 1.6 million tons of coal above the plan is mined at strip mines.

Introduce into machinebuilding 196 highly productive specialized or ganged machine tools, 56 machine tools with program control, and 25 installations for automated and semiautomated welding. Raise the shiftwork factor of the machine-tool pool to 1.4.

Based upon the introduction of new machinery and power tools, reduce the share of manual and heavy labor by 3.6 percent.

By improving the organization of loading, unloading and switching operations and the status and utilization of rolling stock, reduce railroad-car idle time below the established norms by 300,000 car-hours, and repair 20,000 MPS [Ministry of Railways] cars. Increase truck-transport activity 4 percent over the 1982 level.

Take steps to preserve the environment persistently and purposefully, and transfer 30 hectares of recultivated land above the plan to land users.

Bring the scope of brigade forms of organization and work incentives for workers in the industry to 65 percent, including 55 percent in coal machinebuilding, and do 312 million rubles' worth of construction and installing work under brigade contract.

Increase the number of highly productive collectives that exceed the branch-established standards for machinery and equipment productivity to 2,650,

including mining brigades (or sections) with a daily workload of 1,000 or more tons of coal to 495 and those sustaining a workload of 500 or more tons at steep and thin seams to 212, high-speed tunneling brigades to 615 and excavator crews to 424, locomotive and truck brigades to 138 and 351, and integrated brigades that do 500,000 or more rubles' worth of construction and installing work at construction projects to 410, including 105 that do more than 1 million rubles' worth.

Insure improvement in setting labor standards by expanding the practice of applying combined norms and standardized tasks and by the systematic replacement of obsolete norms and standards. Conduct in Shakhterskantratsit [Shakhtersk Anthracite Production Association], Pavlogradugol' [Pavlograd Coal Production Association], Gukovugol' [Gukov Coal Production Association] and Vorkutaugol' [Vorkuta Coal Production Association], respectively, an experiment on improving planning and material incentives for increasing labor productivity. Provide the ratios between labor-productivity growth and the wage fund that the plan established.

Wage a decisive struggle to improve work quality at each workplace and the final product sent to customers and to observe industrial safety requirements.

Improve substantially the quality of the coal mined and reduce the ash content of the coal shipped by 0.1 percent below the norm.

Bring the share of machinebuilding output with the State Emblem of Quality in the total output to 31.2 percent. Insure that at least 75 percent of the housing and social and personal-amenity facilities built are turned over with evaluations of "good" or "excellent."

Insure savings of material and energy resources at each workplace and within all work collectives. Open up accounts of resources saved by brigades, sections, departments and individual workers. Save by reducing consumption norms on the average and by added reductions in consumption of rolled ferrous metals--70,000 tons, 38,000 tons for production, 32,000 tons for construction; lumber--155,000 m³, 85,000 m³ of it for production work and 70,000 m³ of it for construction; cement for construction--42,000 tons; petroleum product for the operation of vehicles and machinery: diesel fuel--22,000 tons, and automotive gasoline--10,000 tons; electricity--300 million kWh; and standard fuel equivalent--45,000 tons.

Reduce planned losses in the industry and in construction by 10 million rubles.

Execute a set of measures to raise further the material and cultural standards of living of the industry's workers. Introduce 2,146,000 m² of total housing space, including 1,007,000 m² built by the forces of the ministry's construction organizations--167,000 m² of this amount by the in-house method, institutions for 5,720 preschoolers, schools for 6,536 pupils, hospitals for 354 beds, polyclinics for 600 patients, vocational and technical schools for 2,240 students, and sanatoria and preventive-medicine facilities for 780 persons; and build individual houses with 70,000 m² of total space. Put into operation storage for 11,000 tons of vegetables and 1,200 m² of total shopping space. Overhaul 1.45 million m² of total housing space.

Improve the health protection of workers and members of their families and provide tickets to health resorts, recreation housing and centers and tourist centers for at least 250,000 persons; to sanatoria and preventive-medicine facilities for 253,000 people; to Pioneer camps, work-and-recreation camps and children's centers--for at least 330,000 children.

Insure that hot meals are served at workplaces to at least 476,000 underground and strip mines.

With a view to realizing the USSR Foodstuffs Program, increase over 1983 the production at state and subsidiary farms of potatoes by 25 percent, vegetables 15 percent, milk 10 percent, meat 13 percent and eggs 8 percent, by raising the sophistication of agriculture, strengthening the feed base and raising livestock productivity. Persistently take measures to make subsidiary farms into farms that are models in equipping and upkeep, into highly productive and profitable production elements of enterprises, construction projects, associations and organizations.

For purposes of building closer ties between production and the general-education school and of inducing students to do socially useful work, intensify work on patronage assistance to schools and vocational and technical schools.

Train 173,000 new workers. Involve 57,000 people in study in evening and correspondence schools and 720,000 in the network of economic-education and communist-labor schools.

Energize the technical creativity of workers and specialists on the basis of strengthening and developing the ties of scientific, design, design-development and production collectives. Thanks to acceleration of the introduction of scientific developments, innovators' suggestions and inventions and the experience of advanced workers, obtain an economic benefit of 194 million rubles, 27.5 million rubles of it through the introduction of inventions.

Coal-industry workers assure the Leninist CPSU Central Committee and the USSR Council of Ministers that they will fulfill with honor the planned tasks and socialist commitments and celebrate 1984 with highly productive shock work in the name of a further strengthening of our Soviet motherland's economic and defensive might.

The commitments were adopted at general meetings of collectives of enterprises and organizations and were approved at an expanded session of the USSR Ministry of Coal Industry Board and the Presidium of the Central Committee of Trade Unions of Coal Industry Workers.

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COAL

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TECHNICAL PROGRESS IN WEST DONBASS COAL MINES RECOUNTED

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[Article by A. V. Shmigol', Engineering Director of Pavlogradugol' [Pavlograd Coal Production Association]: "Technical Progress at the Underground Coal Mines of the Western Donbass"]

[Text] The coal industry is a highly labor-intensive part of the fuel-and-power complex, so the solution of problems of automating production processes and of mechanizing breakage-face and developmental operations in integrated form is first priority. Reequipping the Western Donbass [Donets Coal Basin] with machinery began in 1967, with the appearance of the first narrow-front cutter-loaders and mechanized KMK-97 longwall mining machines for excavating coal from thin seams. The complicated mine-geology, mine-engineering and hydrogeological conditions (weak country rock that has a tendency toward intensive heaving, tectonic dislocations, variable hypsometry, seam thicknesses of 0.55-1 meter, and resistance of as much as 40 N/m of the coal to cutting) have required a careful choice of machinery. Twelve types of longwall mining machines have been tested.

The "Donbass" longwall miner passed its tests at the Ternovskaya Underground Mine in 1972. Fifty-seven longwalls at the association's mines have now been equipped with the "Donbass," seven with the KMK-97 and one each with the KM-87, KM-88, 1MKM and KD-80 longwall miners. Ninety-five percent of the coal is being taken at mine faces with longwall miners. The average daily workload per mine face is 509 tons. Collectives under N. S. Petukhov, A. P. Zolotarev, N. M. Romanov and L. G. Goncharov have achieved workloads of 750-1,000 tons per day and advancement of the breakage-face line by more than 100 meters per month.

Thus, the quantitative portion of the task has been solved. However, with the high level of integrated mechanization of work at the longwalls, the labor intensive work of excavating recesses has remained. Moreover, the reliability of excavating cutter-loaders and of flight conveyors at longwalls is inadequate. The machines are not fitted to the thickness of the seam being excavated, and they have to cut country rock, a process that adversely affects the quality of the coal.

The KD-70 longwall miner was tested in 1976 at the Yubileynaya Underground Mine. Cutter-loader notching in the upper and lower longwalls took no more

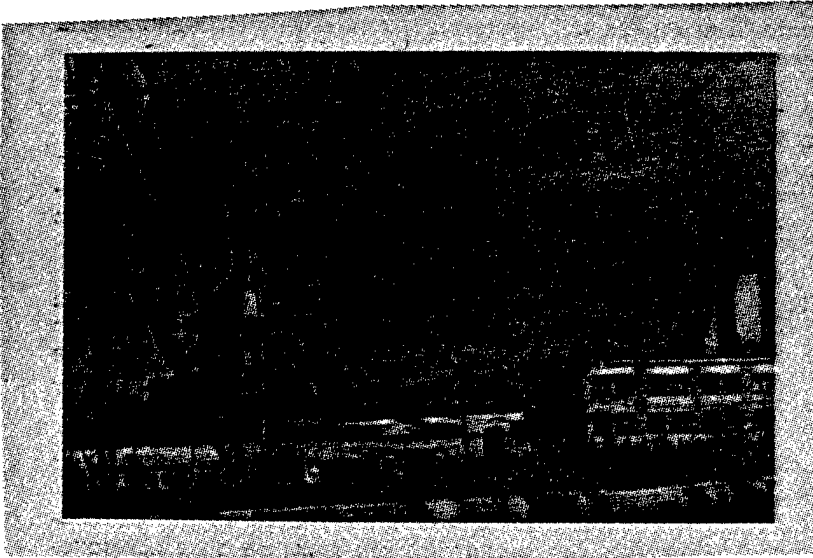
than 30 minutes, recesses were completely precluded, 0.8 meter was being excavated where seam thickness was 0.72 meter, the labor productivity per breakage-face worker was 250 tons per month, the maximum workload per longwall was 900 tons per day, and the average was 500 tons. The KD-80 longwall miner underwent testing at the Ternovskaya mine in 1981, and, since May 1983, after repair, it has been working at a seam 0.8-meter thick (excavating 0.95 meter). The average daily workload at the longwall is 750-800 tons, the breakage face advances about 100 meters per month, and labor productivity of a GROZ [breakage-face mineworker] per shift is 40 tons.

In the first quarter of 1984, KM-103 longwall miners were assembled (one each) at the Blagodatnaya and Pavlogradskaya Underground Mines. The use of KM-103 complexes at thin seams enables the quality of the coal mined to be improved, workload per longwall miner to be increased, labor productivity to be raised, and safety of the work at end sections of the longwall to be provided for by dispensing with the use of explosives at recesses.

The high speeds of longwall advance and the complete replacement of the front of breakage operations in the course of a year have required an increase in the pace of tunneling, which is being done at the association's underground mines mainly (93 percent) by 4PP-2, GPK, GPKSP and PK-3r cutter-loaders with an average speed of 170 meters. The brigades under V. M. Vernigorov, Ye. M. Koshelev, A. V. Putrya, P. D. Ostanin and D. I. Tutunzhiyev reached 350-450 meters per month and tunneled 3.6-4.1 km of excavation per year each. In these brigades each tunneler is qualified to perform any operation at the mine face. Depending upon the profile of the excavation, there are three operating schemes for hauling away the load: electric locomotives at grades of less than 0.05 percent, where UVG-3.3 plain cars or VD-2.5 bottom-unloading cars are used; removal of the rock by conveyors, and the delivery of materials by floor road; and one-end hauling of UVG-3.3 cars by the LVD-34 winch, which is the least productive and the least safe scheme.

In 1980-1983, 10 tunneling faces were converted from end hauling to the conveyor removal of rock. It is planned to eliminate in 2 years end hauling at developmental mine faces, which will enable the pace of tunneling to increase and safety to be improved. With an adequate number of belt conveyors, it will be possible, upon completion of penetration, to obtain a finished tunnel with conveyors installed. We plan to convert in the long term to conveyor delivery of rock to the mine shaft. Such a scheme has been introduced at the Pershotravneva and Pavlogradskaya Underground Mines and is being readied at the Samarskaya mine. In order to reduce labor intensiveness in the loading, unloading and transporting into the mine of materials, reinforced-concrete and wooden roof supports, sleepers, posts, beams, emulsion, metal-arch supports, rails and pipe, the PAKOD packet-type of conveyORIZED delivery of freight has been introduced at nine underground mines. Units of equipment in operation number 548: containers for arch supports, multipurpose containers for piece freight, conveyors for reinforced-concrete supports, and UDG-900 and UDT-900 devices for lowering pipe and rails.

The system being examined requires refinement, but already today it yields substantial savings of monetary and labor expenditures. The economic benefit is 100,000 rubles per 1 million tons of useful material. Coal sent from



General View of the Yubiley-naya subsurface mine.

The Yubiley-naya Mine of the Pavlogradugol' Association, will increase annual capacity to 1.2 million tons of coal when reconstruction is completed in 1985

the longwall to the place where it is loaded into a skip is delivered by conveyors, and the length of the lines is 115 km.

In 1983, 42 conveyor lines and 81 railroad switches were automated. The level of automation of stationary installations was 98.6 percent, and 290 are operating in their automatic mode. Six of the 11 underground mines are equipped with automated systems for controlling industrial processes (ASU TP's) with SATURN subsystems (the system for reporting workers' numbers), AIST (reporting of the work of breakage cutter-loaders), and ODU (current-control reporting).

Such mine surveying tasks as determining the railroad tracks's profile and computing the length of the mine workings are being performed by computer. The following matters are in the authorization stage: execution of pendent theodolite traverse, evaluation of the precision of the junction of meeting mine faces, and leveling of the closed theodolite traverse.

The association's mines are paying great attention to improving the mining activity and to raising the reliability of the workings. Cross-sectional areas are 13.8-15.5 m² along the main direction of the workings, 9.2-11.2 m² in the sections. In the past 5 years the cross-sectional area of mine workings has increased an average of 3 m², and 100 km of the 130 km of mine workings penetrated during the year are supported by metal-arch supports. Under complicated mine-geology conditions, new solutions are being adopted for timbering. For example, a lengthened pedestal on swelling floors, locked supports with inverted vault, grouting of the trans-support space with sand-cement solution or with phosphogypsum and ribbon concrete footings, where the timbering works as a unit.

The repeat use of mine workings will enable the amount of rock evacuated from an underground mine to be reduced, materials consumption to be reduced sharply (a working is 2-fold to 2.5-fold cheaper than making a new one), and losses of coal in protective pillars to be reduced.

Thanks to a well-organized service for the restoration and maintenance of workings, the Underground Mine imeni 26th CPSU Congress achieved 100 percent utilization thereof. The proportion of tunneling here is 1.6-fold below the association average. This experience is being disseminated to the Dneprovskaya, Yubileynaya, Blagodatnaya and Samarskaya Underground Mines and the Underground Mine imeni Leninskiy Komsomol Ukrainy.

Where there is integrated mechanization of breakage and developmental processes, the effective and complete use of machinery and mechanisms becomes of paramount importance. Utilization is, for longwall miners and tunneling cutter-loaders, within or above the standard (76.3 and 68 percent, respectively, versus standards of 73 and 65 percent), and it is 90 percent for belt conveyors. MK-67 and 1K-101 breakage-face cutter-loaders, for which the standard is 65 percent, are being utilized 44 percent, and SP-63m and SR-70m flight conveyors, for which the standard is 83 percent, are being utilized 74 and 56 percent. This is explained by the fact that the cutter-loaders work where mine geology is complicated (the coal's resistance to cutting is as much as 25-35 N/m, and the coal is tough, with pyrite inclusions), they frequently break down, and there are not enough spare parts for repair. The breakdown of cutting implements and of the feed parts of the cutter-loader, the shortage of spare parts, especially for MK-67m cutter-loaders, and failure of the mine-repair plants to meet the standard time periods for repair work compel the size of the cutter-loader fleet to be increased.

It should also be considered that Dneprogiproshakht [Dnepr State Institute for Mine Design] has not developed a design for the integrated development of the coal basin, so production volume per year of the 10th and 11th Five-Year Plans rose by 48.5 percent, but repair capacity increased by only 9 percent. The association was compelled to send equipment to mine-repair plants of the Central Donbass, that is, 200-300 km away (in 1983, 1,305 "Donbass" and MK-97 support sections and 56 breakage-face and 42 tunneling cutter-loaders were sent out and repaired) and to obtain reinforced-concrete items, including 30,000 m³ of roof supports, also from Central Donbass plants.

Because of what has been said, the association has had to equip mine-repair plant departments with machine tools, to arrange for the production of rollers for the belt conveyors and of industrial-rubber products for the longwall-mining machines, and to organize the repair of longwall miners and tunneling cutter-loaders. In 1984 we shall start to operate a new department for rolling metal for mine-work supports, and it will be equipped with high-powered hydraulic equipment. The repair of sections of the "Donbass" longwall miner is being arranged for. The Pavlogradugol' Association and Dneproshakhtostroy [Dnepr Underground-Mine Construction Combine] are building a plant for producing reinforced-concrete products in the region of the Pavlograd group of mines.

In order to solve a number of problems of developing the Western Donbass, the association is working jointly with Dneprogiproshakht, Donugi [Donets Scientific-Research Institute for Coal], the Dnepropetrovsk Mining Institute, the Kiev Polytechnical Institute, the Dnepropetrovsk Agricultural Machinebuilding Institute, Dongiprouglemash [Donetsk State Design-Development and Experimental Institute for Coal-Related Machinebuilding], Giprouglemash [State Design-Development and Experimental Institute for Coal-Related Machinebuilding], and the IGD [Institute for Mining Affairs] imeni Skochinskiy, and with

Dnepropetrovsk State University. Such scientific developments as surface-deformation calculation with a view to improving measures for protecting structures and natural objects, industrial-test verification and introduction of rational methods for protecting repeatedly used drifts, and the development and introduction of rational modes for operating longwall coal-mining machines with a view to reducing the incidence of accidents have been introduced into production and are yielding good results.

Thus, the technical progress that has been planned at Pavlogradugol' Association mines will enable the miners' working conditions to be improved and work safety to be increased. In 5-6 years the level of integrated mechanization of breakage work will reach 100 percent, cutter-loader tunnel excavation 97.3 percent, and the conveyORIZED delivery of coal along horizontal and sloped workings 100 percent. The amount of coal mined in 15-20 years will increase by 85.4 percent (in comparison with 1980), the workload per underground mine will rise by 28.5 percent, and labor productivity per worker for mining coal will be raised by 20 percent.

The use of longwall miners that are intended for thin and extremely thin seams will enable the amount of side rock that is cut into to be reduced and the ash content of the mined mass will be cut by 2-2.5 percent.

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FEATS OF, PROSPECTS FOR ALEKSANDRIYA STRIP MINE TOLD

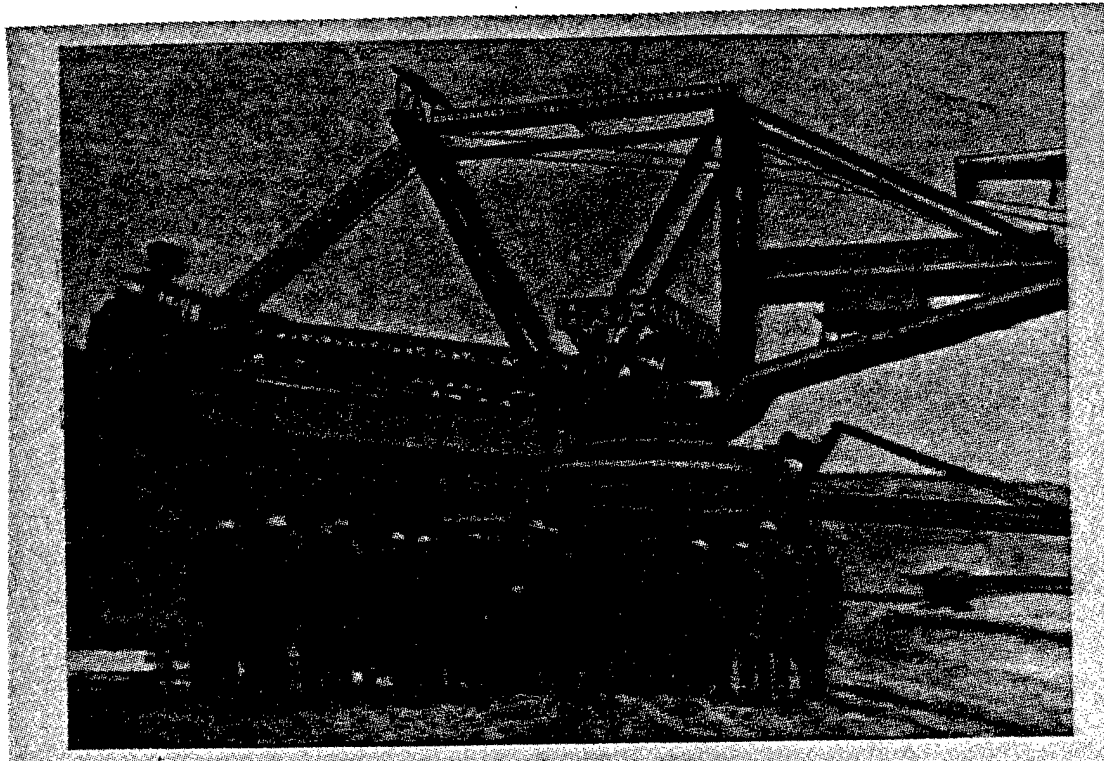
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[Article by A. V. Alekseyev, General Director of the Aleksandriyaugol' Association: "The Labor Achievements and Prospects for Development of the Aleksandriyaugol' Association"]

[Text] Aleksandriyaugol' [Aleksandriya Coal Production Association] includes 13 coal-mining enterprises (7 strip mines and 6 underground mines) with a total annual production capacity of 12.2 million tons, four briquetting plants of 4.4 million tons' capacity, three heat and electric-power centrals, a mine repair plant, a regional power-management administration, a motor pool, and so on. More than 94 percent of the coal mined is processed at the briquetting plants and the heat and electric-power centrals, so the coal-mining enterprises, the briquetting plants and the heat and electric-power centrals have an indissoluble operating bond.

In implementing the decisions of the 26th CPSU Congress and the subsequent CPSU Central Committee Plenums, the association's workers successfully carried out the state plan for 1983. Additionally, 372,000 tons of coal were produced, 4.6 million m³ of stripped rock were heaped on the dumps, and monthly labor productivity per coal-mining worker rose by 4.1 tons. The collectives of the Balakhovskiy and Bandurovskiy Strip Mines, the Vatutinskoye sh/u [Mine Administration], 8 mining sections and 18 mining and 24 tunneling and stripping brigades' completed the plan for the first 3 years of the 11th Five-Year Plan ahead of schedule. In the front ranks of socialist competition were the brigades of breakage-face workers from the Svetlopol'skaya Underground Mine under A. S. Vakulenko and A. V. Dolzhenko, which attained workloads of more than 1,000 tons per day per longwall; tunnelers' brigades of I. T. Artemenko and L. A. Kudr' from the Verbolozovskaya Underground Mine, where the monthly pace of tunneling is about 300 meters; and the excavator-operator brigades of I. A. Kravchenko, G. Ye. Logvinenko and S. A. Geyko from the Balakhovskiy, Bandurovskiy and Verbolozovskiy Strip Mines, which overfulfilled the standard for raising the workload for the year.

The brigade way of organizing work covers 84 percent of the workers at underground mines, 71 percent at strip mines and 75 percent at briquetting plants. Work is constantly being done to improve it, and the statutes about use of the labor-participation coefficient and about organization of the brigade contract, the introduction of which at two stripping sections of the Morozovskiy



The Collective of Stripping Section No 1, under V. S. Stupenko,
at the Morozovskiy Strip Mine

Strip Mine have enabled high results to be achieved, have been developed. During 1983 the NKMZ [Novokramatorsk Machinebuilding Plant] longwall miner heaped 11 million m³ of stripped rock (2.4 million m³ above the plan) on the dump, and the transporting and dumping conveyor heaped 10.4 million m³ (1.4 million m³ above the plan). The prime operating costs for 1 m³ of stripping have been reduced, respectively, by 4.6 and 2.3 kopecks.

The execution of organizational and technical measures for radical improvement in the operation of all enterprises helped the association's success. In order to build up their productive capacity, the first phases of the Medvezheyarskaya Underground Mine and the Andrushevskiy Strip Mine, with annual production capacities of, respectively, 1.2 and 0.4 million tons of coal, were introduced ahead of time. An Administration for the Assembly, Disassembly and Repair of Mine-Transport Equipment and an Administration for Land Recultivation, which are fulfilling plan tasks, were created within the association.

Obsolete and worn bulldozer, excavator and truck fleets have been partially replaced at strip mines in recent years, and rolling stock for 900-mm wheels has been acquired. It is planned to replace single-bucket EKG-4.6 excavators with EKG-8 excavators, RS-350 rotary excavators of obsolete design with modern imported SRS-280 excavators, and BelAZ-540A trucks (with load capacity

of 27 tons) with BelAZ-548 trucks (40 tons), and domestic walking excavators of high unit capacity will be used under a transport-free system of development.

At the Verbolozovskiy Strip Mine, the OLG-1200 heap-former is to be introduced, and the station for repouring stripped rock on the transport-dumping conveyor is to be rebuilt. At the Morozovskiy Strip Mine the end conveyor is to be modernized and the second heaping conveyor is to be replaced, and buckets for selective cutting, which will raise the productivity of the NKMZ complex, will be hung on the ERShR-1600 rotary excavator. It is also planned to replace the wooden timbers on the conveyor-support structure with metal sleepers. Obsolescent equipment is being replaced and scientific and technical achievements are being introduced at mines, briquetting plants, heat and electric-power centrals, the mine-repair plant and other enterprises.

In order to maintain the association's mining level during the 11th and 12th Five-Year Plans, it is planned to introduce the Konstantinovskaya Underground Mine, the Konstantinovskiy Strip Mine (with annual capacities, respectively, of 1.5 and 2.1 million tons), and the Mokrokaligorskaya and Ryzhanovskaya (the Vatutino brown-coal region) Underground Mines, and to build individual sections. In order to provide for stable operation of the briquetting plants for the near term, heat and electric-power centrals and a mine-repair plant will be rebuilt.

The association is paying great attention to questions of social development. It is planned to build in the next few years apartment houses with 280,000 m² of housing space, preschool institutions for 1,520 children, two general education schools, a House of Pioneers, an interschool combine for labor education, a polyclinic and a surgical building. For the workers' health protection, it is planned to erect a therapeutic center for 100 patients, an athletic complex and a recreation facility on the Dnepr and Ingulets Rivers.

Enterprise laboring collectives have at their disposal large reserves for radically improving the work and for maintaining the necessary order in all spheres of production activity. In order to fulfill successfully the state plan for the fourth year of the Five-Year Plan, it is necessary to use these reserves, to introduce advanced experience and the achievements of scientific and technical progress more boldly, and to perfect the management mechanism more completely.

Aleksandriyugol' Association workers, in response to December 1983 CPSU Central Committee Plenum decisions, have widely promoted socialist competition for raising production effectiveness and work quality and fulfilling ahead of time plans and tasks of the fourth year of the 11th Five-Year Plan. The following socialist commitments were adopted for 1984:

mine 56,000 tons of coal, manufacture 12,000 tons of brown-coal briquettes, and heap on the dumps 467,000 m³ of stripped rock, all above the plan;

reduce planned losses by 500,000 rubles, by reducing production costs 0.5 percent and by improving the quality of the coal mined; and

provide for labor productivity growth per worker for mining coal and for manufacturing gross product by 1.5 percent above the plan.

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SPECIAL GOBBING EQUIPMENT NEEDED AT DONBASS COAL MINES

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[Article by Engineer V. V. Tarasenko (UkSSR Minugleprom): "Basic Directions for Solving the Problem of Leaving Rock in Donbass [Donets Coal Basin] Underground Mines"]

[Text] Leaving in underground mines the rock that has been obtained during tunneling and mine-working repair is one of the problems upon whose solution a further rise in the operating effectiveness of the republic's coal industry greatly depends. Over a period of 17 years a systematic increase in the amount of rock sent out of underground mines has been observed. Thus, in 1983, 131 million tons of rock were sent to the surface, 74 million tons of it from tunneling and mine-working repair, 57 million tons with the coal (supra-seam ash), and about 6.8 million tons remain in the mines. During the last 8 years the amount of rock sent out of UkSSR Minugleprom [Ministry of Coal Industry] mines increased almost 17 percent. The greatest share of it in 1983 (in tons per 1 thousand tons of mined coal) was in these associations: Donetskugol'--660 tons, Dzerzhinskugol'--495 tons, Artemugol'--535 tons, Pervomayskugol'--485 tons and Ordzhonikidzeugol'--460 tons.

At present, the necessity for bringing seams of less than 0.8 meter in thickness into development more widely has been set for a number of underground mines and associations. This involves not only an increase in the specific amounts of developmental tunneling done but also an increase in the coefficient of cutting into the side rock, and, consequently, an increase in the total amount of wall rock brought out.

Many mines have converted to working coal reserves at deep horizons, which involves an increase in the cross-sectional area of workings needed for ventilation and repairfree maintenance thereof, and an increase in the sizes of rolling stock. Each year UkSSR Minugleprom underground mines are producing 2,900 km of developmental mine workings, sending out more than 70 million tons of rock from making these workings and repairing them. More people and material resources are diverted to servicing transport of the rock complex (40 percent of the electric locomotives and cars, 35 percent of the underground transport workers), and expenditures exceed 100 million rubles per year. At mines where continuous conveyerization is used, rock from tunneling and from repair of workings often arrives in the common flow and degrades coal quality. Thus, in the past 10 years the coal's ash content from

contamination was raised by 2 percent. Because of the lack of selective excavation during tunneling, about 4 million tons of coal go to the dump each year. Calculations indicate that as the trend of increase in cross-sectional area of developmental workings and in complication of the conditions for their upkeep persists, the amount of extracted rock will be increased. Besides the negative influence on the work of the mines, the rock that is being stored in dumps on the surface affects the environment adversely, since the combustion products pollute the air basin. About 3 billion tons of rock have already been accumulated in the dumps, and they occupy more than 6,000 hectares of land.

A characteristic feature of the UkSSR Minugleprom underground-mine inventory is the fact that converting enterprises to excavating coal and leaving the rock underground often requires a restructuring of mining and transporting activities, since the designs for construction and reconstruction did not, as a rule, study critically the matter of leaving the rock in the mine. Under design standards, the amount of rock is assumed to be 30-40 percent of the amount of coal mined. In accordance with these principles, a corresponding throughput of transport arterials was called for, which included the network of mine workings in the horizons and lifting shafts. Right now the underground mines have practically reached the maximum possibilities for sending rock to the top. If steps are not taken that are aimed at stopping the growth in the amount of rock sent out and then in gradually reducing that amount, the rock problem will become a factor that will exert a definite influence not only on development of the mine but also on its normal functioning.

Since the 1970's, after a Laboratory on Gobbing Technology was created at Donugi, research has started that includes questions of creating an equipment base for doing gobbing work and of engineering support therefor. Some theoretical, experimental and design-development work has now been done, and, as a result, the rational area of the use of gobbing of excavated space has been determined, special types of equipment for mechanizing the work have been created, and operating schemes for excavating the coal and for making workings, with gobbing of the rock that is thus obtained into nearby tunneled space, have been developed.

Technical solutions for reducing the amount of rock sent out by underground mines from excavation and repair of workings are being effected in three main directions (figure 1):

- 1) excavation in the seam, with gobbing of the rock into the evacuated space;
- 2) excavation of the coal, with roof control by gobbing the evacuated space or with the erection of rock protective strips; and
- 3) the elimination of workings by gobbing them with rock.

The first direction includes the technology for making single or paired excavations of seams, using the Titan crushing-and-gobbing equipment complex, or the BShU boring and worm conveyor and ZU gobbing installation to gob the rock into the excavated space. These resources are used at underground mines with gently sloping and inclined seams, when making mine workings following the

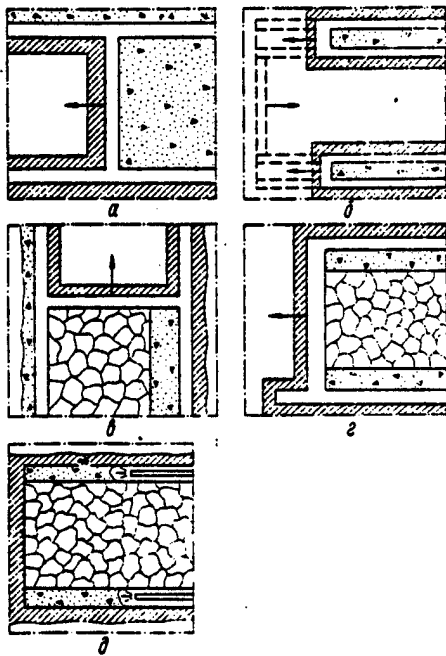


Figure 1. Development Systems That Call for Leaving the Rock in an Underground Mine.

- a. With full gobbing of breakage-face excavated space;
- б. With preparation of the excavated section by paired workings, with gobbing of the rock thus obtained into the excavated space between them;
- в. With gobbing the rock into the excavated space of the breakage face near the drift;
- г. With gobbing of rock from making workings into the excavated breakage-face space near the drift; and
- д. With gobbing of the rock into a working that is being eliminated.

breakage face. In 1983 the length of the workings made by gobbing rock with the Titan complex was 9.5 km, the ZU installation 126.5 km; 285 and 3,420 tons of rock, respectively, were laid in.

In recent years, experimental and industrial-testing work has been done to create a technology for making paired excavations for a broad mine face, with the rock gobbed into the excavated space. Donugi [Donetsk Scientific-Research Institute for Coal], Dongiprouglemash [Donetsk State Design-Development and Experimental Institute for Coal Machinebuilding] and other organizations are creating a set of equipment of three types for paired workings. The KSV-1, KSV-2 and KSV-3 complexes are intended for tunneling paired workings along gently sloping seams 1.4-2 meters, 0.9-1.4 meters and 0.6-0.9 meter, respectively. In the first and second model sizes, cutter-loaders with serially produced mechanized supports excavate the coal, and flight conveyors and a traction organ locked in the horizontal plane send the coal out. The rock is gobbed into the excavated space by the pneumatic method with the KSV-1 complex and mechanically by the KSV-2, while the KSV-3 calls for a drilling and auger-conveying installation to excavate the coal and gob the rock.

It should be noted that development of the KSV's opens up prospects for preparing mine floors for working under the pillar system without sending the rock to the surface but with incidental mining of coal, and, in strongly gas-bearing seams, also for preparing floors of any length, in accordance with the ventilation factor.

The second direction of technical solutions calls for further improvement and expansion of the area of use of breakage-operations technology with roof control by gobbing the excavated space or by erecting rock strips near the drift, under the pillar system of development. This direction is based upon the use of sectional or centralized DZK crushing-and-gobbing complexes that are equipped with special PZP and PZK pneumatic gobbing equipment.

The third direction calls for gobbing rock by means of Titan complexes, ZU-type installations and special throwing machines, to eliminate workings at underground mines where the bottleneck is transporting and elevating and where free surface space for storing rock is lacking. Right now rock is being gobbled to eliminate workings only at the Underground Mine imeni Gazeta Sotsialisticheskii Donbass (Donetskugol'). Eventually this method is to be introduced at other mines, and, in 1985, 200,000 tons of rock will be placed in workings that are being eliminated.

A positive circumstance here is the fact that the gobbing of worked-out space lays the basis for increasing the effectiveness of working seams under complicated mine-geology conditions, for excavating coal reserves under protected surface objects, and so on. Thus, in an experimental procedure, coal reserves were extracted from under the central part of Donetsk, using pneumatic gobbing, under a group of Yenikiyevo plants, using hydraulic gobbing, and under the Rostov-Kharkov trunk rail line, with gravity gobbing of the worked-out space.

The effectiveness of gobbing worked-out space is high, since the negative influence on normal breakage-face operation of such factors as roofs that are extremely unstable or difficult to collapse, sliding soil, and a tendency of the coal to ignite spontaneously is reduced or completely eliminated.

Work to protect seam workings with the help of rubble strips made by the pneumatic method deserves great attention where there is a pillar system. Results obtained yield a basis for considering it possible to create conditions for repairfree maintenance of workings and the repeat use thereof. These factors become especially important when work is done at great depths.

The technology of erecting protective rubble strips pneumatically with the pillar system has been introduced at the newly constructed Komsomolets Donbass Underground Mine (Shakhterskantratsit Association) and the Underground Mine imeni Stakhanov (Krasnoarmeyskugol' Association). At the first mine, workings protected by rock strips are used repeatedly practically without repair, and deformation of them is reduced (in comparison with other protective methods) more than 3-fold. The cross-sectional area of workings that are being maintained behind the longwalls at the interface with the excavated space has been decreased by 12-15 percent, while under previously applied methods for protection it was reduced by more than 50 percent. In 1983, an economic benefit of about 50,000 rubles was obtained by leaving rock behind, and of more than 100,000 rubles by reducing the expenditures for maintenance of the working.

In order to organize gobbing operations at the modern technical level, new special equipment must be created. As a result of scientific research and design development, PZP and PZK gobbing complexes and the Titan crushing-and-gobbing complex were designed for the Donbass (for mines that excavate gently sloping and steep seams), and complexes for excavating and gobbing breakage faces and tunneling complexes for paired workings are being created. The possibility of increasing coal mining, improving the technical and economic indicators for operation of the mines and the industry as a whole, ending

additional expropriation of land area for heaps and then of shrinking these areas, and reducing contamination of the air basin by harmful products from the oxidation of chemical substances that come with the rock to the earth's surface, depends greatly upon successful solution of the problem of reducing the amount of rock removed from the mines. Given the growing scientific, technical and production potential of the republic's coal industry, these problems can be solved in the near future.

UkSSR Minugleprom and Donugi have worked out an entire integrated program for developing gobbing operations that calls for a concentration of financial and material resources, with a view to the systematic reduction of rock sent out of the mine to the level of the requirements laid on low-waste technologies. Realization of the program will create the prerequisites for solving the following tasks:

- the resumption of operations at and the excavation of coal reserves that are located under protected surface objects, with full gobbing of the excavated space. To start with, gobbing complexes are to be built at the Underground Mines imeni 25th CPSU Congress (Makeyevugol'), imeni M. Gor'kiy and imeni Kalinin (Donetskugol') and, later, at the Underground Mines imeni Bazhanov and imeni Pochenkov and Chaykino Underground Mine (Makeyevugol'), and the Underground Mines imeni Kiselev (Torezantratsit) and imeni Zasyad'ko (Donetskugol');
- the provisioning of safe conditions for developing steep seams with roofs difficult to control, sliding soils, and coal that ignites spontaneously. The desirable area of use of gobbing of excavated space at underground mines of the Donbass's central region (according to Donugi's data) embraces 100 mine seams, or a third of the total number. At present, only 22 breakage faces are working with the gobbing of excavated space. It is proposed to greatly increase the number of breakage faces with gobbing at steep seams, for which purpose crushing and gobbing complexes are being built at a number of central-region underground mines;
- the creation of conditions for repairfree upkeep of seam workings and for the repeated use thereof, under the pillar system, with a pillarfree technology for excavation as the result of erecting rubble strips pneumatically. Such a technology is being used at the Underground Mine imeni Stakhanov and the Komsomolets Donbass Underground Mine. In order to mechanize the erection of rubble strips, gobbing complexes will be constructed at the Yuzhnodonbasskaya No 3 (Donetskugol') and Krasnoarmeyskaya Zapadnaya No 1 Underground Mines, the Underground Mine imeni Stakhanov (the 986-meter level), and the Krasnoli-manskaya (Krasnoarmeyskugol') and other underground mines. The length of the protective rubble strips for mine workings is being increased appreciably;
- reliable protection of seam workings, thanks to the erection of rubble strips by Titan-1 complexes, where there are continuous and combined systems of development. Such complexes are being used at 33 underground mines, and in 1983 about 11 km of workings were made with their help; and
- the use of a basically new scheme for the preparation and working of floors, as a result of KSV complexes making paired workings in a broad mine face, with placement of the rock between them. It is planned to bring the amount of paired workings made with rock left in the excavated space to 8 km by 1985, and later it will grow substantially. This technology will be introduced primarily at underground mines where underground transporting and elevating are a bottleneck, and also where it is difficult to put rock on the surface.

In order to carry out the planned program, aside from the indicated construction of crushing-and-gobbing complexes, there should be constructed, in particular, mechanized complexes with gobbing pipelines based upon the KD-80 and KM-87 breakage-face machines and KSV-type complexes. The output of the equipment that is included in the PZK and PZP complexes, whose serial production has been mastered at the Yasinovataya Machinebuilding Plant, must be renewed. Moreover, the question of creating a repair base for gobbing equipment, that is, of building a specialized repair plant, must be resolved.

As a result of execution of all the planned measures, each year the amount of rock sent out of Donbass underground mines will be cut by several tens of millions of tons, which will provide a substantial economic benefit--up to 400 million rubles.

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TECHNICAL, ECONOMIC IMPACT OF ACTIVE SEAM TREATMENT ANALYZED

Moscow UGOL' in Russian No 4, Apr 84 pp 7-9

[Article by Candidate of Engineering Sciences A. Ye. Perezhilov (MGI [Moscow Mining Institute]): "A Technical and Economic Analysis of Methods for Active Treatment of Seams"]

[Text] The effectiveness of traditional methods and means (moistening the coal, spraying, and so on) for coping with hazards in underground mines (sudden outbursts, accumulations of methane and dust, and so on) often restrain growth in the average daily workload at operational breakage faces with integrated mechanization. The dust environment at excavation sections often is complicated.

The speeds of air motion necessary for thinning methane accumulations is, in practice, higher than the optimal moving speeds for dealing with dust. Dust suppression effectiveness of standard spraying systems for breakage-face cutter-loaders does not exceed 70 percent in operation. The use of these systems for suppressing dust with particle sizes less than 5 microns is poorly effective. The use of seam degassing holes for preliminary moistening of the coal in the solid mass after lengthy operation thereof is technically and economically undesirable because of the breakdown of the seal and the lack of the necessary time interval for the fluid to stay in the seam (2-3 years). The drilling of holes and injection of working fluid into outburst-prone seams can lead to dynamic phenomena.

In the Karaganda basin, work is going on in integrated fashion to raise the level of degassing of seams in the coal-bearing stratum. In so doing, additional holes are being drilled in the area of a completed hole: barrier holes (when making developmental excavations in thick seams), horizontal holes both along the dip or rise of the seam (from thick and average-thickness seams that are being excavated that are subjected to the influence of breakage operations), from the surface, and from underground workings in the area of caving pots, as well as underground water drain holes in the area of the main hydraulic system of fractures. Thanks to such degassing of coal-bearing strata, conditions are created for a continuous increase in the mines' productive capacity. However, the extraction of methane from the cracked-rock coal mass is sometimes accompanied by a reduction of the natural moisture content of the seam in the hole zone, which raises the pathenogenicity and explosive-proneness of the coal-dust aerosol suspension and can lead to emergency situations.

MGI has developed and tested new methods for active treatment of the gas-bearing stratum. Studies of the effectiveness of hydraulic fracturing and of microbiological, physico-chemical and multiphase treatment of seams have been performed at the Underground Mines Kommunist, imeni M. I. Kalinin, imeni A. A. Skochinskiy, imeni V. P. Menzhinskiy and others in the Donets basin; and imeni Kostenko, Saranskaya, Churubay-Nurinskaya, imeni Kalinin and others in the Karaganda basin. These mines are dangerous because of sudden outbursts and explosiveness of the dust from seams of steam and coking coals, and also of anthracite, which, in terms of specific dust liberation, is in the dusty or extremely dusty categories. The dust situation of breakage and developmental faces was studied. As a result of this, the status of the mine atmosphere and economical expenditures on the work of injecting water into the seam under the breakdown mode and of injecting aqueous solutions of a bacterial suspension and ureaformaldehyde resin in filtration modes were evaluated. As a result, a technical and economic analysis was made of methods for active treatment of seams from the point of view of reducing dust formation and the dustiness of the mine atmosphere.

The dust environment at workplaces at breakage and developmental faces was studied under an improved methodology. Dust samples were taken at typical points of measured cross-sections at a longwall on AFA filters by means of miners' AERA ejector aspirators. At developmental mine faces, dust measurements were performed at a cutter-loader operator's workplace and 10 and 50 meters from it. At least three samples were taken during the established technological process at each characteristic point of the cross-section measured. The dispersed composition of the dust suspended in the air was determined on an aerosol sedimentator designed by MakNII [Makeyevka Scientific-Research Institute for Operating Safety in the Coal Industry].

In order to compare the results obtained prior to and after active treatment of the seams with working fluids, the changing variables were revised by means of weighted-average values and by restricting the range of their actual change.

The residual dust content of the air and the dispersed composition of the dust aerosol within the experimental section were adopted as criteria for evaluating the effectiveness of active treatment of the seam in terms of the dust factor.

The main indicators of hydraulic breakdown of seams and the results of studies of the effectiveness of this method for treating seams in terms of the dust factor for mine breakage faces are cited in table 1.

As the research results indicated, the condition of the mine's atmosphere was improved at the breakage-face workplaces during the excavation, loading and transporting of coal, the movement of support sections, drilling and blasting operations, and so on.

From the data cited in table 1, it follows that the effectiveness of hydraulic breakdown of seams changes over a broad range. This is caused basically by the magnitude of the volume of fluid injected into the seam, by the type of fluid, the time of its exposure to (contact with) the seam, and by the method for completing the holes for hydraulic breakdown. At the Kommunist

Table 1

Underground mine, association	Seam thickness, meters	Hole No.	Depth of zone of development, meters	Average rate of pumping, liters/sec.	Pressure, MPa			Total amount of solution pumped, m ³	Mine working	Cutter-loader	No. of samples	Effective-ness
					At hole face	At start of hydraulic breakdown of the seam	Maximum at hole mouth					
Imeni Kostenko, Karaganda-ugol'	8.2	3	476.0	76.0	13.5	17	478*	2d eastern longwall of upper layer	KSh-3M	266	86.3	
	8.0	8	473.0	56.6	2.5	11	7854*	4th eastern long-wall of 4th excavation	KSh-3M	193	70-80	
Saranskaya, k "	8.0	9	508.0	48.2	8.5	12	1778	Ditto	KSh-3M	115	78.6	
	8-8.8	10, 11	545.7-565.2	53.1-55	-	13-16	3276-4409*	Ditto	KSh-3M	210	35.0	
Karaganda-ugol'	7.0	1	407.0	66.2	4.5	18	3102*	4th "A" western longwall of upper layer	KSh-3M	238	30.8	
	7.2	2	409.2	56.7	1.5	11	3586*	Ditto	KSh-3M	86	30-35	
Imeni V. R. Menzhinskiy, Perovomaysk-ugol'	6.0	3-bis	422.5	30.0	2.0	7	2899*	Ditto	IGSh-68	273	42.2	
	4.8	4	414.0	72.5	9.5	11	9881	4th eastern long-wall of upper layer	2K-52	178	74.2	
Imeni V. R. Menzhinskiy, Perovomaysk-ugol'	7.6	5	419.2	43.5	2.5	11	6282	Ditto	2K-52	234	77.8	
	1.4	270	719	34	7.2	14.7	332	Southern reverse longwall--horizon 777 m.	1K-101	180	65-73 (80-97)**	
Komunist, Oktyabr'-ugol'	1.2	632	370	31.5	18.7	18.7	331	31st longwall	BK-52	2680	68.2-69.5 (41.6-72.3)**	

*Hole zone of the seam was completed.

**Reduction in the air's content of alveolar dust with particle size of less than 5 microns (lower and upper limits, respectively, without spraying and with spraying).

Underground Mine of Oktyabr'skaya Association, while working seam g_1^M , thanks to physico-chemical, microbiological and multiphase measures, the dust content with particles sizes of less than 5 microns was reduced, respectively, by 20.2-53.2, 30.3-57.9 and 28.1-68.1 percent. It was established that the maximum reduction in the propensity of the coal to form dust was observed in the zones of holes uncompleted for hydraulic breakdown, the minimum in the seam's hole zones that had been subject to pneumatic force-back of the working fluid in the depths of the solid mass or to pump-out of the working fluid to the surface with subsequent capture of the methane. Thus, at the Churubay-Nurinskaya Underground Mine of Karagandaugol' Association, while working seam k_1 , the effectiveness of hydraulic breakdown in terms of the dust factor in a hole zone with a radius of about 65 m was zero; this is explained by the working fluid being pushed through by compressed air into sections more distant from the hole. There were cases also of a negative effect of hydraulic breakdown in terms of dust, when the level of the dust content at a section being treated was higher than at an unprocessed one. This was caused by reduction in the coal's natural moisture content during intense degassing of the seam.

The air's content of dust that can cause pneumoconiosis was reduced by 98 percent at longwall workplaces.

In the industrial tests of methods for active treatment of seams, no signs of explosiveness of coal-dust aerosol suspensions were observed during study of the experimental sections.

The validity of the data on the effectiveness (see table 1) of hydraulic breakdown of seams is confirmed by a large volume of mine and laboratory studies on dust content and the concentration of alveolar dust at breakage faces of Donets and Karaganda basin underground mines.

As a result of active treatment of seams, the toughness of the coal is reduced, promoting more effective work of the tunneling and breakage-face cutter-loaders. Thus, at the Kommunist Underground Mine of the Oktyabr'ugol' Association, thanks to the treatment of the g_1^M seam, the average daily workload on the 29th and 31st longwalls was higher in the zones of hydraulic breakdown and of physico-chemical, multiphase and microbiological treatment from, respectively, 654 to 1,031 tons, 930 to 1,170 tons, and 472 to 706 tons.

The economic benefit \mathcal{J} (in rubles per 1 ton of coal mined) from realizing methods of active treatment of the seam was computed in accordance with a methodology developed at MGI in accordance with the formula

$$\mathcal{J} = \mathcal{J}_n + \mathcal{J}_k + \mathcal{J}_{n,y} - \mathcal{J}_c.$$

where \mathcal{J}_n , \mathcal{J}_k and $\mathcal{J}_{n,y}$ are the economic benefit per 1 ton of mined coal, from, respectively, the reduction of the morbidity rate for workers with pneumoconiosis, increase in average daily workload per longwall, and elimination of expenditures for preliminary moistening of the seam, in rubles; and \mathcal{J}_c are the expenditures for 1 ton of mined coal for executing the corresponding seam-treatment method, in rubles.

In determining the economic benefit, in terms of the dust factor, of the method of active treatment of the seam, only a third of the total expenditures on realization of the method was considered, since it was directed concurrently in the drives against the presence of gas, dust formation and sudden outbursts.

The relative values of the economic benefit in terms of the dust factor of methods for treating the seam are shown in table 2.

Table 2

Method of treating the seam	Treated coal reserves, thousands of tons	β_A	β_n	$\beta_{n,y}$	β
Hydraulic breakdown.....	145	1.12	1.17	0.05	2.22
Microbiological method.....	18	0.78	0.84	0.05	1.22
Physico-chemical method.....	10.4	0.86	1.14	0.05	1.22
Multiphase method.....	44.8	1.40	1.51	0.05	1.78

For purposes of the drive against the main hazards in underground mines, active treatment of the seams must be used. It is economically desirable to use hydraulic breakdown and the multiphase method of treating the seams (see table 2).

The set of studies of the dust environment at breakage-face and developmental-face workplaces in underground mines that were carried out testifies to the high effectiveness of methods for treating seams from the standpoint of reducing overall dust content, the pneumoconiosis hazard and explosive concentrations of coal-dust aerosol suspensions.

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COAL

NEW BOOK ON IMPROVING DONETSK PRODUCTION EFFICIENCY REVIEWED

Kiev RADYANS'KA UKRAYINA in Ukrainian 15 Apr 84 p 2

[Review by V. Cherkas of book "Donetskiy Protsent" [Donetsk Percent] [in Russian], Vydavnytstvo "Donbas", Donetsk, 1984, under the heading "New Books": "Unutilized Potential for an Additional Percentage Point"]

[Text] "Increasing labor productivity by 1 percent above and beyond the plan target will enable industry in Donetsk Oblast to boost output in 1984 by 117 million rubles. A 0.5 percent decrease in production cost provides industrial enterprises with additional yearly profit of 80-85 million rubles."

Such "facts to ponder" are presented in the book "Donetsk Percent," which has just been released by the "Donbass" Publishing House. Only a few months have passed since the Central Committee of the Ukrainian Communist Party voiced its approval of the work being done by party organizations and workforces of the city of Kiev and Donetsk Oblast which they have undertaken to carry out an additional party task in the area of boosting labor productivity and reducing production cost, and yet within this short time the Donetsk publishers have succeeded in studying and carefully gathering up the first bits of experience and promptly presenting them before the court of public judgment. An important point is that this experience is discussed by the very persons responsible -- vanguard miners, construction workers, machine builders, grain farmers, party organization leaders, and Soviet activists. They also specifically point out untapped potential which must be better utilized. This gives their statements a particular relevance and up-to-dateness.

Renowned miner-innovator V. Ignatov, brigade leader at the Krasnolimanskaya Mine, is convinced that "a mine does not like inert people," that collective innovative quest is a guarantee of success. And this is how the brigade he heads operates. All major questions pertaining to production, and especially organization of labor, adoption and utilization of new equipment and advanced know-how are discussed and resolved collectively. They traveled as far as the Kuzbas, to the Raspadskaya Mine, to learn how to adopt a new high-output mechanized system; they borrowed the practice of all miners mastering associated job categories from their competition rivals -- the brigade led by Hero of Socialist Labor A. Polishchuk from the Donetsk Trudiv's'ka Mine. The brigade is improving organization of labor with the collective contract method, and the brigade leader is justly concerned:

it is essential that the mine economic service more promptly "get with it" and arrange record-keeping procedures in such a manner that each day the workers can see the results of their labor. This is an important psychological incentive in competition. S. Novats'kyi, leader of a Communist labor brigade at the Kommunist Mine, supporting his colleague at Krasnolimanskaya, also stresses that in addition to such tried and proven reserve potential for successful accomplishment of the party's supplementary task as adoption of progressive methods of organization of labor, acceleration of scientific and technological advance, boosting of the effectiveness of socialist competition, establishment of an economy regimen, and improvement of the mechanism of economic management, greater attention should be focused on the morale factor, with constant concern to ensure that each and every brigade has a good production attitude and that there prevails an atmosphere of a unified working family and innovative quest. He titled his article "Plus the Human Factor."

The party organization at the Zhdanovtyazhmash Production Association is one of the largest in Donetsk Oblast. There are more than 5,000 Communists in its ranks. In the 11th Five-Year Plan they have led the workforce competition under the slogan "Greater Production With a Fewer Number." Party committee secretary V. Butyrin relates in the book how and by what methods the shop party organizations and party groups are achieving increased production efficiency. Considerable work is being done in the association to adopt brigade forms of organization of labor. The party committee has devoted considerable attention to placement of Communists in the brigades. Presently 380 party groups and more than 340 party organizers are functioning in the brigades. Communists have assumed the role of trailblazers in adopting economic accountability and scientific organization of labor in the brigades. They are doing a great deal to strengthen labor discipline and orderly procedure.

N. Yer'yomenko, chairman of the executive committee of the Volnovakhs'kiy Rayon Soviet, writes persuasively about the strength of the brigade form of organization of labor and the collective contract on the farm. Last year 37 mechanized detachments and 45 livestock units in this rayon operated under the new procedures. But the point is not in quantity. It is important to succeed in achieving qualitative changes -- in the detachments which were working under a collective contract, crop yields were boosted by 18-20 percent, and production costs declined by 10-15 percent. The author candidly points to the difficulties which were encountered during adoption of the new organization of labor and emphasizes that even today there are still managers and supervisors who have no desire to burden themselves with additional concerns, or who are ignorant of the finer points of the brigade contract and therefore are impeding this new development.

Interesting thoughts on unutilized potential for successfully accomplishing the party's supplementary task are expressed in this book by honored construction worker UkSSR G. Polosman, G. Ostroverkhov, chief of the planning and economics department at Azovstal', N. Tkachenko, general manager of the Spartak Sovkhoz, and others. Party guidance of competition by the working people of Donetsk Oblast to boost labor productivity and reduce production costs is thoroughly analyzed by V. Kucherenko, second secretary of the oblast party committee.

The journalists at the "Donbass" Publishing House have done a conscientious job of enriching the book with interesting information and the places where advanced know-how has been acquired. In particular, they inform us: "In the Chervono-armeyskugol' Production Association 12 brigades are operating on a schedule of 1,000 tons per day and are bringing up 60 percent of the total coal production."

"Hero of Socialist Labor Z. I. Chornen'ka, milkmaid at the Diktatura State Pedigree Stock Farm, produced in 1983 6,684 kilograms of milk from each of the 30 cows assigned to her."

"P. V. Karev, assistant foreman at the Donetsk Cotton Combine, handles 72 looms, with 40 the standard number. Since the beginning of the five-year plan he has been responsible for the manufacture of more than 900,000 meters of above-target product."

Please visit these locations, learn, and adopt the know-how of the vanguard workers!

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CSO: 1811/57

COAL

SYNOPSIS OF ARTICLES IN UGOL' UKRAINY, APRIL 1984

Kiev UGOL' UKRAINY in Russian No 4, Apr 84 p 48

UDC 622.013.3:658.5.018.2

TECHNICAL PROGRESS AT WESTERN DONBASS UNDERGROUND MINES

[Synopsis of article by A. V. Shmigol' in UGOL' UKRAINY, No 4, 1984 pp 1-3]

[Text] A rise in the technical level of production and improvement in work organization at Pavlovgradugol' Association underground mines.

UDC 622.013 "Aleksandriyaugol'"

LABOR ACHIEVEMENTS, PROSPECTS FOR DEVELOPMENT OF ALEKSANDRIYAUGOL' ASSOCIATION

[Synopsis of article by A. V. Alekseyev in UGOL' UKRAINY, No 4, 1984 pp 4-5]

[Text] The results of the work of enterprises and separate brigades of Aleksandriyaugol' Association in 1983. Organizational and technical measures that helped in the successful work of the association. Commitments.

UDC 622.273.217.5.002.5

BASIC DIRECTIONS FOR SOLVING PROBLEMS OF LEAVING ROCK IN DONBASS UNDERGROUND MINES

[Synopsis of article by V. V. Tarasenko in UGOL' UKRAINY, No 4, 1984 pp 5-7]

[Text] The rock activity of underground coal mines. Technical solutions on gobbing rock into excavated space and the development of gobbing operations. 1 illustration.

UDC 622.277:622.232.5

GEOTECHNOLOGICAL METHOD FOR MINING COAL BY HYDRAULIC-IMPULSE EFFECT

[Synopsis of article by A. N. Zorin, A. T. Didenko and M. V. Vinokurov in UGOL' UKRAINY, No 4, 1984 pp 8-9]

[Text] Results of an industrial test check of a geotechnological method for mining coal that is based upon the hydraulic-impulse effect, in the environment of the Underground Mine imeni Voroshilov of the Dzerzhinskugol' Association. 1 illustration, 1 reference.

UDC 622.822.22:622.232

PREVENTION OF ENDOGENOUS FIRES AT UNDERGROUND MINES WITH PANELBOARD EXCAVATION OF COAL

[Synopsis of article by N. V. Kaledin, P. S. Pashkovskiy and V. M. KRAVETS in UGOL' UKRAINY, No 4, 1984 pp 9-10]

[Text] Recommendations on the use of various versions of panelboard technology for the excavation of coal, taking fire safety into account. The causes and circumstances of spontaneous combustion of coal during panelboard excavation, and recommendations. 1 illustration.

UDC 658.531:622.3.31:622.016.62

STATISTICAL ASSESSMENT OF DYNAMICS OF LABOR EXPENDITURES AT ACTIVE BREAKAGE FACES

[Synopsis of article by N. P. Karlina in UGOL' UKRAINY, No 4, 1984, pp 11-12]

[Text] Questions of an index assessment of the level and dynamics of labor expenditures of workers at active breakage faces. Methodology of statistical analysis of the influence of the main factors and of intragroup and intergroup structural shifts. 1 table.

UDC 622.01.5

ASSESSMENT OF STRUCTURE OF PRIME OPERATING COST FOR MAKING DEVELOPMENTAL EXCAVATIONS WITH CUTTER-LOADERS

[Synopsis of article by V. A. Karmazin in UGOL' UKRAINY, No 4, 1984 pp 13-14]

[Text] Dependence of elements of prime operating costs for conducting 1 meter of developmental excavation by GPK and 4PP-2 cutter-loaders on speed of penetration.

UDC 622.01.3+622.22

PECULIARITIES OF MATHEMATICAL-ECONOMICS SIMULATION OF UNDERGROUND-MINE FLOORS OF IRREGULAR SHAPE

[Synopsis of article by N. A. Rangin in UGOL' UKRAINY, No 4, 1984 pp 14-15]

[Text] The legitimacy of replacing underground-mine floors of irregular shape with a rectangle during mathematical-economics simulation. The introduction of corrective factors. 1 table, 1 illustration.

UDC 622.267.5.082

COSTING OUTLAYS FOR ANTIOUTBURST MEASURES WHEN MAKING DEVELOPMENTAL EXCAVATIONS

[Synopsis of article by I. L. Sushko in UGOL' UKRAINY, No 4, 1984 pp 16-17]

[Text] The results of an evaluation of costing outlays for existing and local methods developed for preventing surprise outbursts of coal and gas that are used when making excavations. 2 tables, 1 reference.

UDC 621.575:622.8(045)

NEW TECHNIQUE FOR AIR CONDITIONING AT DONBASS UNDERGROUND MINES

[Synopsis of article by G. V. Duganov, Ye. P. Zakharov, V. F. Rozhko and A. I. Shtompel' in UGOL' UKRAINY, No 4, 1984 pp 18-20]

[Text] Conditions and modes for operation of a conditioning system for firedamp air. Reliability and economic feasibility of an absorption bromine-lithium cooling machine at the Underground Mine imeni 22d CPSU Congress (Stakhanovugol'). 1 table, 3 illustrations.

UDC 622.232.72:622.26

BREATHER OF HYDRAULIC TANK OF 4PP-2 TUNNELING CUTTER-LOADER

[Synopsis of article by A. D. Bondarenko, A. G. Kanatayev and V. G. Nesterenko in UGOL' UKRAINY, No 4, 1984 pp 20-21]

[Text] A new breather for a hydraulic tank, for eliminating pollution of the working fluid by atmospheric dust. Merits of the breather and results of a survey. 3 illustrations.

UDC 621.644.3.004.1:622.457.2

OUTFITTING AND RULES FOR OPERATING FLEXIBLE AIR CONDUITS

[Synopsis of article by F. A. Kozhanov, N. I. Shkil' and V. O. Rudenchik in UGOL' UKRAINY, No 4, 1984 p 22]

[Text] The status of operation of flexible ventilation conduits in underground mine conditions. A description of the pipes and the molded parts for them, the outfitting thereof, and rules for operating the flexible ventilation pipelines under underground-mine conditions. 1 illustration.

UDC 622.232.72

INFLUENCE OF MINE-GEOLOGY CONDITIONS ON SERVICE LIFE OF 1K-101 LONGWALL MINER

[Synopsis of article by V. I. Proskurin, V. A. Tynyanyy and V. I. Plugatarenko in UGOL' UKRAINY, No 4, 1984 p 23]

[Text] The results of a study of the service life of the 1K-101 longwall mining machine as a function of mine-geology conditions.

UDC 622.815.853"313" (477.61/.62)

COMPARISON OF FORECAST AND ACTUAL OUTBURST HAZARD OF COAL SEAMS

[Synopsis of article by Yu. P. Zubarev in UGOL' UKRAINY, No 4, 1984 p 24]

[Text] Results of a comparison of methods for forecasting the outburst hazard in accordance with Temporary Guidance and Methodological Recommendations of IMR [Institute of Mineral Resources]. 2 illustrations, 2 references.

UDC 622.817.47

DEGASSING OF SEAMS AT DEEP HORIZONS OF UNDERGROUND MINES

[Synopsis of article by V. S. Zaburdyayev and B. Ye. Rudakov in UGOL' UKRAINY, No 4, 1984 pp 25-26]

[Text] The peculiarities of gassing in deep underground mines, and an evaluation of gas yield of seams at various depths. Experience in the integrated degassing of sections with a daily workload per longwall of more than 1,000 tons. Functions that characterize change of effectiveness of degassing at sections with different excavating technologies. 1 table, 2 illustrations, 2 references.

UDC 622.838.53:622.257.1

DIMENSIONS OF ROCK PILLAR FOR PLUGGING OUTBURST-PRONE SEAMS

[Synopsis of article by E. Ya. Kipko, Yu. N. Spichak, I. V. Muzyukina and A. E. Kipko in UGOL' UKRAINY, No 4, 1984 pp 27-28]

[Text] Method for computing the thickness of a rock pillar through which plugging holes are safely drilled and special plugging solutions are injected into the seam, for reducing outburst proneness. 2 illustrations.

UDC 622.412:536.244

FAVORABLE PHYSICAL PROPERTIES OF MINE ROCK

[Synopsis of article by Sh. I. Oniani, O. A. Lanchava and Yu. R. Ksovreli in UGOL' UKRAINY, No 4, 1984 pp 28-29]

[Text] The results of research of favorable physical properties of rocks of the Tkibuli-Shaorskoye solid-coal field. 1 table, 1 illustration, 1 reference.

UDC 622.413.4:622.014.3:502.76

MINING AND NATURE CONSERVATION

[Synopsis of article by G. N. Kuzetchenko and M. F. Gontar' in UGOL' UKRAINY, No 4, 1984 pp 30-31]

[Text] Nature conservation work done by Donetskugol'.

UDC [556.33+622.333](477.63)

HYDROGEOLOGICAL CERTIFICATION OF WESTERN DONBASS UNDERGROUND COAL MINES

[Synopsis of article by A. M. Antroptsev in UGOL' UKRAINY, No 4, 1984 pp 31-33]

[Text] Urgent hydrogeological tasks that arise in connection with intensified development of the Western Donbass. Hydrogeological certification for underground coal mining. Recommendations on the use of certifications when solving hydrogeological and nature-conservation tasks in the region. 1 table, 1 illustration.

UDC 622.7.092:543.822

MONITORING PERMISSIBLE POLLUTION OF COAL DURING MINING

[Synopsis of article by N. A. Dobrogorskiy in UGOL' UKRAINY, No 4, 1984 p 33]

[Text] Monitoring pollution of the fuel during mining by means of a pollution coefficient.

UDC 622.73 "TsOF Sukhodol'skaya"

OPERATION OF CRUSHING-AND-MILLING MACHINES AT TsOF OF "SUKHODOL'SKAYA"

[Synopsis of article by A. V. Lesikov in UGOL' UKRAINY, No 4, 1984 p 34]

[Text] The use of DFM-2 crushing-and-milling machines when unloading frozen coal from railroad cars at the TsOF [Central Preparation Plant] of Sukhodol'skaya. 1 illustration.

UDC 622.723

UNIT FOR MECHANIZING PRIMARY TREATMENT OF COAL

[Synopsis of article by A. V. Novoseletskiy and B. P. Bondar' in UGOL' UKRAINY, No 4, 1984 pp 34-35]

[Text] A unit developed by Ukrniiprojekt [Ukrainian Scientific-Research and Design Institute for the Coal, Ore and Gas Industries] for mechanizing the primary processing of coal. Design, specifications, advantages and test results for the TsOF of the Donetskaya of Torezantratsit Association. 1 illustration.

UDC 622.333:551.243.001.18(477.61/.62)

FORECAST OF DEGREE OF DISTURBANCE OF SEAMS BY WEAK-AMPLITUDE FRACTURES AT DEEP HORIZONS

[Synopsis of article by Yu. N. Nagornyy, A. A. Bel'gard and V. N. Nagornyy in UGOL' UKRAINY, No 4, 1984 pp 36-37]

[Text] Basic principles of a methodology developed by the authors for forecasting the degree of disturbance of coal seams by low-amplitude fractures with the use of the data of mining and geological exploration. Results of the compilation of forecast maps for working seams.

UDC 622.831.322

VISCOUS FLOWING SUBSTANCES FOR PLUGGING GEOLOGICAL FRACTURES DURING HYDRAULIC BREAK-UP OF SEAMS

[Synopsis of article by V. A. Gromov and A. V. Boykova in UGOL' UKRAINY, No 4, 1984 p 37]

[Text] Viscous flowing substances with high mechanical-structure properties based upon the use of drilling mud.

UDC 551.252:622.26(477.6)

DISCONTINUOUS FAULTS WITHIN ROVENETSKIY UPLIFT IN DONBASS

[Synopsis of article by G. M. Smorodin in UGOL' UKRAINY, No 4, 1984 pp 38-39]

[Text] Peculiarities of the structure of discontinuous fractures within the Rovenetskiy uplift, and forecast of the hydrogeological and mine-geology conditions for transiting the fractures by mine excavations.

UDC 622.833.3:622.26

REFORMING OF MINE-ROCK STRATA DURING REPEATED OVERWORKING

[Synopsis of article by I. A. Novichikhin and N. V. Krotov in UGOL' UKRAINY, No 4, 1984 pp 39-40]

[Text] The results of underground mine observations and the conditions under which the deforming of a rock stratum is activated during repeated overworking and unloading of seams from the mine pressure. 2 illustrations.

UDC 622.268.7

UNIFICATION OF PARAMETERS OF JUNCTIONS OF MINE WORKINGS FOR WESTERN DONBASS UNDERGROUND MINES

[Synopsis of article by V. K. Kononenko in UGOL' UKRAINY, No 4, 1984 pp 41-42]

[Text] Minimal necessary number of standard sizes of junctions of workings: a unified number of lateral cross-sections on the basis of which any junction of stepped form is built. 1 table, 1 reference.

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11409

CSO: 1822/281

ENERGY CONSERVATION

SUPREME SOVIET COMMISSION MEETING ON ENERGY CONSERVATION

Moscow IZVESTIYA in Russian 17 Dec 83 p 2

[Article by Yu. Grin'ko: "Multiply by Labor and Thrift: A Meeting of the Preparatory Commission on Power Engineering"]

[Text] We are all rightly proud that the Soviet Union now is the world's leading producer of a number of fuel and energy resources. The volumes of extraction and consumption and the optimal shares of various resources in the country's fuel and energy balance have a huge influence on the Soviet economy's levels of efficiency. At the 26th CPSU Congress it was noted that the development of the basic sectors of heavy industry, and first of all the fuel and energy sectors, is an unconditional prerequisite for a solution to all national economic, production and social tasks. What is the present condition of the fuel and energy sectors? What measures should be taken so that the country can obtain more coal, oil and gas? What is necessary to generally bring the required order into the use of these resources? Such was the circle of questions which concerned the USSR Supreme Soviet at the second meeting of the Preparatory Commission on Power Engineering. Its purpose was to discuss unsolved problems and to work out recommendations for refining the indicators for the draft of the State Plan for the Economic and Social Development of the USSR in 1984 in order to more completely meet the economy's growing demands on the basis of existing resources. The meeting was conducted by G. P. Bogomyakov, first secretary of the Tyumen Obkom of the CPSU. Reports were given by: A. Lalayants, deputy chairman, USSR Gosplan, V. I. Mishchevich, chief, Oil and Gas Department, USSR State Committee on Science and Technology. Yu. G. Teplov, deputy chief, Heavy Industry Financing Administration, USSR Ministry of Finance; V. K. Laptev, deputy minister, USSR Mingazprom [Ministry of the Gas Industry]; and M. I. Schchadov, first deputy minister, USSR Minugleprom [Ministry of the Coal Industry].

At the meeting it was reported that there had been an acceleration of the activities of labor collectives of enterprises, associations, ministries and departments regarding the search for additional reserves for the planned development of fuel and energy sectors. There are increases in the extraction of all types of fuel. Compared to 1982, this year the growth in the extraction of petroleum, including gas condensate, was 6.4 million tons, for gas the figure was 36 billion cubic meters, and for coal -- 3.6 million tons. The total extraction and production of primary fuel and energy resources exceeded 2.1 billion tons of standard fuel.

Every sector of the fuel and energy complex had substantial achievements. However, as the deputies noted, there are large reserves for improving the country's fuel balance, reserves which often are insufficiently actively utilized.

Take, for example, petroleum workers. In spite of generally successful fulfillment of the "black gold" extraction plan, the techno-economic indicators for associations such as Nizhneartovskneft', Krasnoleninskneft', Glavtyumen'-neftegaz and Kirgizneft' leave something to be desired. There was also criticism of related departments, which were unable to completely meet their obligations to petroleum workers on time.

Construction organizations in the main contracting ministries did not meet the construction and installation work volume plans for nine months of the current year. Collectives of Minneftegazstroy [Ministry of Construction of Petroleum and Gas Industry Enterprises], Mintransstroy [Ministry of Transport Construction] and Mintyazhstroy [Ministry of Construction of Heavy Industry Enterprises] even reduced their work pace compared to the same period last year. As a result, many production facilities, houses and childrens institutions were not introduced. Delivery deadlines and volumes for basic materials and equipment for petroleum industry enterprises were not met. Above all, this applies to half of the manufacturing plants of the USSR Minkhimmash [Ministry of Chemical and Petroleum Machine Building] and USSR Minchermet [Ministry of Ferrous Metallurgy]. Big shortages of sucker rods, compressors and walking beam units are creating serious difficulties for petroleum extraction and well preparation.

The preparatory commission meeting directed well founded criticism towards USSR Minugleprom. This is, of course, no accident. The sector's development rates lag substantially behind five-year plan targets, the planned mastery of mine capacity is not being reached and capacity reserves are declining. Department representative reports and deputy speeches discussed the low standards of organizational and engineering work at the sector's enterprises. There were indications of the unsatisfactory course of major construction, especially reconstruction and the preparation of new horizons at operating mines and pits.

In recent years USSR Minugleprom has permitted considerable increases in output production costs. Last year the industry's gross output per worker declined by 0.2 percent compared to the year before last, and by another 0.4 percent in 9 months of 1983. More than 18 months ago at the Donetsk, Kuznetsk, Karaganda, Pechora and Ekibastuz the overwhelming share of miners were converted to the new conditions for paying labor. Unfortunately, the sector is being more than modest in its use of the potentials in miners' wage increases.

After analyzing shortcomings in the work of fuel sectors, the preparatory commission made specific recommendations for improving their activities.

In examining the draft plan for 1984 it was noted that it is intended to further increase the production and extraction of the basic types of fuel. The task is to not only reach, but surpass the planned goals.

The subsurface wealth of our nation is great, but its limits must be kept in mind. Moreover, in order to increase the extraction of fuel and energy, each year it is necessary to move further north and east, to inaccessible and sparsely inhabited regions. This is not cheap. Consequently, under present conditions it is smarter and cheaper to emphasize the more complete, rational and thrifty consumption of oil, gas and coal. Stating the value of a responsible attitude towards material resources, at the November (1982) CPSU Central Committee Plenum, Yu. V. Andropov, General Secretary of the CPSU Central Committee and Chairman of the USSR Supreme Soviet Presidium, stated that an economic and zealous attitude towards national wealth is now a question of our plans' realism. The deputies had an especially active discussion of the efficient use of all types of fuel in sectors involved in their extraction.

V. I. Kremnev, first deputy minister of Minnefteprom, began his report in a buoyant tone: "Implementing the suggestions and comments of USSR Supreme deputies and commissions made during the examination of the 1983 plan, oil workers have had notable results. In order to improve the utilization efficiency of the drilled well stock, almost 7,000 wells have been converted to the mechanical method of production. Between January and September of this year, the use of new methods of oil recovery from strata helped produce more than 3 million additional tons of this valuable raw material."

"At the same time," K. A. Abrasov added, "the ministry did not attain the planned percentage of oil production from automated fields. Even the figure planned for next year is 5 percent below the 1983 figure. And what about associated gas! There is a noticeable tendency to reduce the levels of its use. During 1981-1982 and the first half of 1983 alone, tens of billions of cubic meters of associated gas were vented and flared. These facts cannot be refuted. What is the explanation?"

For the sake of fairness it should be noted that oil workers were greatly let down by Glavtyumen'neftegazstroy. It is at fault for not meeting schedules for the operational introduction of a number of facilities for the collection and processing of associated gas — the Lokosovskiy Gas Processing Plant and the Varvegovskaya Compressor Station.

However, the gas workers' omissions are indisputable.

The share of gas in the USSR's fuel and energy balance is approaching 30 percent. It was noted at the meeting that the search for ways of skillfully using this fuel is a very important task for the entire economy. USSR Mingazprom's technical policies foresee the optimization of gas production and

consumption and for state supervision over its use. At the same time, there is quite a bit of waste and carelessness in gas consumption. Last year more than half of 3,000 enterprises in 14 ministries used equipment without meters. The State Gas Inspectorate should, of course, more strictly inquire into the lack of order in the consumption of this valuable fuel.

It is essential to comprehensively solve the problems of gas use. Where there is no such approach to the matter, there are unfortunate snags on the way to the goal. Here is an example: In order to meet the target for the conversion of electric stations from mazut to gas, Mingazprom and Minneftegazstroy were on time in completing the construction of branch lines for the Kharkov, Perm, Yaroslavl and Urengoy electric stations. However, there are great delays in the construction of the low pressure gas distribution manifolds. Gas has thus not replaced this costly petroleum product. The deputies noted that it will not be at all right for branch pipelines to be operating and consumers not have the necessary time to prepare for receiving the fuel.

A considerable effect is expected from the conversion of motor vehicle transport to compressed natural gas. This will improve the environment and free quite a lot of scarce motor fuel, as each vehicle so equipped annually saves about 8 - 10 tons of gasoline.

A network of compressor stations for filling motor vehicles (AGNKS) is being created. Mingazprom is the client for their construction, but it is slow in supplying the technical documentation. Moreover, gas workers can find no common language with local organs when it comes to site selection. The former, of course, try to put them in well equipped sites, right near existing utility lines. This is truly economical. The latter, naturally, are not opposed to including items in the client's estimate which, although they have no direct relation to the station, would not be at all superfluous to the city (or settlement). There is no end to such adjustments, but time goes by.... The problem is complex enough even if such situations are handled on the sole basis -- the good will of both parties. At times this is lacking of one or the other party.

The commission meeting touched upon many problems concerning miners' activities. Special attention was given to coal quality; it often does not meet the set standards.

S. K. Tokumtayev's speech was emotional and assertive.

It is no secret that at many mines roof rock is removed during the extraction of coal from thin seams. It is not disputed that it is difficult to preserve coal quality under such conditions. It is difficult, but it must be done! It is the duty of enterprise managers and mine supervision to see that correct technology is observed. In the final account high quality coal is not simply a question of technological policy. It is, if you like, a moral problem, involving the education of young workers in a communist attitude towards labor. It is intolerable that rock is sent to customers, concentrate from coal preparation plants is mixed with run of the mine coal and quality indicators are substantially exaggerated. The moral losses here can be incomparably greater than the economic ones.

There are other problems. This is not the first year we have mentioned that Minugleprom is not meeting plans for coal briquet production. They have promised too much and not delivered enough. In the final account can one listen to representatives from a ministry which is hindering serious work on supplying the population with high quality fuel? When does the sector intend to meet its obligations for the production of a good which in all rights should be included as a mass consumption good?

No matter how sharp the question, it must be answered. This was done by M. I. Shchadov, first deputy minister of the USSR Coal Industry.

He stated: "Last year the "minus" for briquets was almost 600,000 tons. Its doubtful if we can handle this year's plan. There is not enough coal of the necessary grades. The Temirtau pit is worked out, while the Tyulgan in Orenburg Oblast has not yet been introduced. It will go into operation in the immediate future. It has also been decided to resume operations at another one million ton section. We firmly intend for the factory to meet its targets next year and supply the public with 2.6 million tons of briquets."

The meeting listened closely and between the lines of M. I. Shchadov's report, a disappointing admission that the miners' faults are obvious and that it is not necessary to search for guilty parties. Answers must be found....

The reliability of the Soviet economy depends upon the quantity of fuel and energy resources extracted and upon how economically and zealously they are used. The problem has two sides, but there are many ways to its solution. Each must be pursued to the end.

The preparatory commission worked out solutions and suggestions. In the next few days they will be examined by the planning-budget and other permanent commissions of the USSR Supreme Soviet and be included in the plan and budget for 1984.

11574.
CSO: 1822/271

ENERGY CONSERVATION

ESTONIAN ENERGY CONSERVATION IMPLEMENTED

Moscow IZVESTIYA in Russian 29 Mar 84 p 2

[Article by V. Kyao, first deputy minister, ESSR Council of Ministers: "The 'Energy Economization' Program"]

[Text] How we handle the earth's resources today and what price society pays for energy are extremely important to future generations. The 26th CPSU Congress and the November (1982) Plenum stressed the need for an active energy conservation policy. Our republic is now working seriously on saving fuel and energy.

Studies made by the republic's Academy of Sciences and Gosplan show that in the near future Estonia's demand for energy will increase by about 1.3 fold, and for electric power -- 1.7 fold. These data show the need to attentively study the condition of power engineering in the republic. Analysis has shown that many enterprises, organizations, kolkhozes and sovkhoses make poor use of reserves for fuel and energy conservation. It has become clear that we have real potentials for substantially improving the economy's energy efficiency.

The Estonian CP Central Committee and the republic Council of Ministers approved a decision on the development of a republic comprehensive program "Energy Economization" for the 11th Five-Year Plan and the period up to 1990. Its main goal is to improve the use of fuel and energy resources through the application of scientific and technical achievements and progressive experience, the introduction of scientifically based norms for the consumption of fuel and electrical and thermal energy and to sharply reduce their losses.

The "Energy Economization" Program has three basic directions.

The first is to assure the normal operation of existing power engineering facilities. This task can be solved in one or two years and almost without costs. It will save 5 - 10 percent of fuel and energy resources. In essence this involves introducing organizational and technical order and strengthening technical and production discipline.

The second is to improve and raise the efficiency of existing energy equipment. Sizable outlays are necessary here, but they are substantially less than those for the extraction and transportation of fuel and the production and transmission of electrical and thermal energy. This circle of tasks can be completed

in 2 - 5 years. The average annual savings of fuel and energy resources could reach 15 percent.

Finally, the third direction is the conversion to new, energy conserving technology. This is the most capital intensive and long term direction, expected to take 3 to 8 years. However, the savings for various sectors could reach 30 - 50 percent of fuel and energy resources. We have begun work on the first two directions. The third one is the main direction for the long term.

The main points of the republic program for 1981-1982 have generally been implemented. This is, above all, thanks to those enterprises where primary importance is placed upon energy conservation.

At the Silikat plant energy outlays are almost 10 percent of total prime costs. The entire collective drew up the plant program for energy savings. It was discussed by all plant services and shops, the main directions and measures and what was required for their implementation were clearly outlined. The plant set up its own measurement laboratory and keeps accounts and sets norms for fuel and energy resources. It has consequently given incentives to workers economizing on energy. The plant's boilers have been converted to gas. It has introduced strict control over the correct selection of process equipment capacity and working conditions. The main thing is that it has genuinely started to really take pains about energy savings. It annually achieves about a five percent reduction in fuel and energy consumption.

The experience of the republic's better enterprises shows that there is a series of measures which permits rapid and substantial reductions in fuel and energy consumption in practically all sectors of the economy. Their implementation has become obligatory for us. What are these measures? Experience shows that the setting of well based norms for fuel and energy consumption leads to 5 - 10 percent savings in fuel and energy for all consumers. Periodic heat rate testing and adjustment of power engineering equipment and the compilation of working condition charts will help increase equipment efficiency factors by 2 - 5 percent, with corresponding savings in resources. The adjustment of feed-water economizers, air preheaters, improved systems for collecting condensate and recycled water and the installation of automation and control instruments increase the efficiency factor by 10 percent, resulting in large fuel savings. The installation of heat and hot water meters, thermostats and electric drive control devices saves up to 20 - 30 percent of energy consumed. The introduction of obligatory monitored heating at all enterprises and institutions makes it possible to save about 20 percent on heating. The filling of night "troughs" in electric station loads is a major reserve, increasing the efficiency of station operations.

The greatest return is promised by the optimization of the republic's fuel balance. It should be said that this will require quite large outlays for the construction and reconstruction of boilers, heat supply systems, gas pipelines and interior heating and ventilation equipment. However, they will be paid off by considerable fuel savings.

In addition, it should be stressed that the implementation of these and many other energy conservation measures involves the solution of problems of great importance outside of our republic.

First of all, this includes problems of covering outlays for energy conservation measures. According to the data of Academician T. Khachaturov, such outlays are on the average 3 - 4 fold lower than outlays for extracting and transporting an equal amount of additional energy resources. The efficiency of energy conservation measures is indisputable from a state perspective. However, existing practice forces fuel and energy users to reason somewhat differently in many cases: the main effect is somewhere else (reductions of extraction and transportation outlays), while the outlays are mine. What is more, they come from resources for the development of the enterprise (sector). Is it worth doing? Apparently, a system of targeted financing and material supply for energy conservation measures should be developed and introduced.

Second, there are questions of the relationships between territorial and sectorial organs during the implementation of energy conservation policies. The optimal development of the fuel and energy complex of a territory (republic, economic region) is possible only if this complex is viewed as a single whole. In the republic today we can only have a definite influence on those fuel and energy consumers who are supported by funds from the ESSR Council of Ministers. Undoubtedly, the development and introduction of energy conservation technology is a sector affair, while fuel and energy supply problems should, it appears, be solved to a great extent on the territorial level.

Third, there is material supply to energy conserving measures. The acute shortage of instruments for metering, controlling and regulating (especially heat) is a great hinderance to putting energy savings measures into effect. The production of these instruments is growing so slowly that it is not even clear when the situation will be corrected. In Tallin, for example, there is a national plant producing heat meters. However, we are not able to get more than a few units annually from it, while hundreds are needed. Possible, we should set about organizing or expanding such production on a shared basis for a group of neighboring economic regions.

Fourth is the organization of energy norm setting. Experience shows that enterprise workers either do an unqualified job of norm setting, or do not do it at all. It is apparently necessarily to thoroughly improve the organization of such work at a sector level. The republic's experience shows that in those sectors which have solid norm setting stations, such work is done well at enterprises. This practice is unconditionally justified.

Fifth is the incentives system for saving fuel and energy resources. Its general principles have been formulated at the national level. However, there are delays in making these principles specific for sectors and enterprises. Consequently, a very effective tool in the struggle for energy conservation is not in use. I would like to note here that existing prices and rates for fuel and electric power do not always help in this struggle. For example, there are clearly delays in a solution to the problem of introducing "night" rates for electric power.

The establishment of regional centers for problems of electricity supply could make some contribution to solving this. The experiences of some regions in the USSR and abroad shows that electricity supply problems are most successfully solved where there is scientific and methodological leadership over this work, and the development of the basic directions and measures as well as their techno-economic evaluation are concentrated within the framework of a single organ. Such a center would ensure the scientifically based and economically effective direction of energy conservation work for the region in general and could give qualified help to the region's enterprises in working out their energy conservation measures. In Estonia, a study is now being made of problems in creating such a center at the ESSR Academy of Sciences' Institute of Thermophysics and Electrophysics.

Over a 10 year period the implementation of the program in the republic should save many millions of tons of standard fuel. At the ~~maximum~~ cost for energy conserving measures the national economic effect from the realization of the program will amount to a hundred million rubles. As they said in olden days, the sheepskin is worth cleaning.

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GENERAL

HAVRYLENKO ON GEOLOGY DAY

Kiev RADYANS'KA UKRAYINA in Ukrainian 1 Apr 84 p 2

[Article by UkSSR Minister of Geology M. Havrylenko: "Riches in the Earth"]

[Text] Geologists, whose professional holiday is being celebrated today, are involved in the constructive changes occurring on the map of our republic and in the emergence of new cities and industrial complexes.

Volnogorsk, Yershansk, Dneprorudnoye, Novyy Rozdol, Ugledar, Chervonograd and other towns have grown up comparatively recently in areas of geological discoveries. At the present time 6 mining combines, more than 20 coal and ore mines are under construction and on the drawing boards in this republic, and 15 new gas fields have been developed.

Mineral resources are our most important national wealth. The fact that we possess adequate mineral resources to provide for the needs of all types of industry is an exceptionally important advantage of the Soviet State. The Ukraine is making a weighty contribution to the nation's overall balance sheet. It is one of the leaders in production of iron and manganese ores, coal, native sulfur, graphite, potassium salts, and other minerals.

The 26th CPSU Congress assigned large and responsible tasks to the prospectors of our mineral resources pertaining to further increase in reserves of fuel and energy raw materials, strengthening the raw-materials base of currently-operating mining enterprises, looking for and finding raw materials for the manufacture of mineral fertilizers.

The workforces of our ministry successfully completed all geology tasks for the first three years of the five-year plan. In the past year alone 7 oil and gas fields have been discovered, as well as 3 coal deposits. The target for increasing apatite reserves was overfulfilled, new deposits of native sulfur were discovered, and 17 peat bogs were turned over to agriculture.

Geological prospecting and exploration personnel are honoring this year's holiday with good success. They have met the five-year-plan target for increasing sulfur and apatite reserves. Three gas fields have been discovered. They have successfully completed the plan for the first quarter.

The Soviet Union's first deep oil and gas exploration is being carried out in the Ukraine. For example, commercial quantities of gas have been discovered at a depth of 6,000 meters in the Dnieper-Donetsk Basin. This confirmed geologists' predictions that the presence of oil and gas bearing strata at considerable depths was highly likely.

Today commercial quantities of natural gas are already being obtained from comparatively recently discovered fields -- the Yablunivske in Poltava Oblast, and the Stepovske and Bereziyske in Kharkov Oblast. This is a qualitatively new stage in development and exploitation of this republic's mineral wealth: passage beyond a depth of 5 kilometers. Drillers are now drilling holes which are to be sunk to a planned depth of 7,500 meters in one of the most promising areas -- the Dnieper-Donetsk Basin.

Coal is being assigned an important role in the current five-year plan in increasing our fuel and energy resources. The Donbass, which in recent years has greatly expanded its boundaries, is of great importance today, as it has been in the past. Geological exploration and survey efforts have been stepped up, to do the preliminary work on reserves of particularly valuable high-grade coking coal in the Central and Southern Donbass.

Today scientific forecasting plays a leading role in improving the efficiency of geological exploration activities. New methods of investigation, geophysics, and development of high-altitude aerial and space techniques of studying natural resources, as well as deep drilling -- all this is making discoveries possible today, enabling us to reassess the Ukraine's prospects for mineral resources.

Until quite recently it was believed that discovered coal reserves for currently producing mines in the Lvov-Volyn Basin would last only to 1990-2000. Geologists, however, employing modern forecasting methods, refuted that claim. Discovered fuel reserves grew by more than half again as a result of prospecting and exploration activities.

The task to increase iron ore reserves is being successfully accomplished. Completion of exploration of the Gulyaypole iron ore deposit, together with the previously discovered Kuksungurskoye and Mariupolskoye deposits, have made it possible to establish a reliable raw material reserve for this republic's metallurgical industry, especially such a giant enterprise as the Combine imeni Il'ich in Zhdanov. New ore bodies in the Krivoy Rog Basin are being successfully developed.

A new stage in the geological study of the territory of this republic demands coordination of the efforts of scientists and specialists not only of the UkSSR Ministry of Geology but also of the institutes of the republic's Academy of Sciences and higher educational institutions.

Adoption of project results and recommendations of branch institutes on scientific substantiation of focal areas of geological exploration activities has improved the quality and effectiveness of prospecting and exploration efforts to find oil, gas, coal, iron, and other minerals.

Competition for above-target increase in labor productivity by one percentage point and half a percentage point decrease in cost of geological prospecting and exploration activities is spreading in this branch. The geological exploration people at the Chernigov Neftegazgeologiya Association are the initiators, and their initiative has gained the support of all geological associations in the Ukraine. Unfortunately we have workforces which have not fully realized that unswerving accomplishment of plan targets and highly-productive labor are not only an obligation but a standard by which we should live. Adoption of new equipment leaves much to be desired. High-output drilling rigs are being brought on-line rather slowly. There are also some brigades which have failed to reach branch performance standards in drilling rate.

We want each and every workforce successfully to carry out adopted pledges, to provide stronger incentive for those which achieve the best results, with extensive utilization of new forms of initiative and advanced know-how.

Many workforces in our branch are resolving root problems in a businesslike manner. They are performing as genuine organizers of socialist competition. Geological prospecting and exploration personnel of the Yuzhukrgeologiya, Chernigovneftegazgeologiya, and Donbassgeologiya production associations have repeatedly placed high in the All-Union Geologists Labor Competition.

The initiative of the workers of the Poltavaneftegazgeologiya Production Association has spread considerably and gained support not only in the Ukraine but throughout the country. They proposed to accomplish each year an additional month's standard drilling amount above and beyond the plan target with economized funds. The initiative was taken up by 57 percent of drilling brigades just in this republic. Last year alone these workforces saved 10 million rubles. This paid for drilling 30,000 meters of deep exploratory wells.

The vanguard workforces of this branch display an example of constant innovative approach to accomplishing their tasks. For example, the brigades headed by drilling foremen Mikhaylo Dmytrovych Avramets, USSR State Prize recipient and holder of the Order of Lenin, from the Poltavaneftegazgeologiya Association, and Petr Petrovych Svyntsyt's'ky from the Voroshilovgradgeologiya Association reported completion last year of their five-year-plan drilling program.

Today the attention of this republic's geologists is centered on the decisions of the February (1984) CPSU Central Committee Plenum and the speech by CPSU Central Committee General Secretary Comrade K. U. Chernenko at a get-together with his constituents. We are directing all efforts toward successful implementation of party guidelines.

The workforces of this branch have pledged to overfulfill 1984 plan targets, without additional allocations and material resources, pertaining to increasing reserves of oil, iron and manganese ore, native sulfur and apatite, coalfield production capacity, and to reduce the per-ton cost of surveying reserves of these minerals by 2-5 percent.

Now we must do everything possible to give maximum specificity and purposefulness to competition aimed at boosting labor productivity and lowering production costs.

3024

CSO: 1811/55

GENERAL

POWER STATION OPERATORS IN NATIONAL COMPETITION

Kiev RADYANS'KA UKRAYINA in Ukrainian 23 Sep 83 p 2

[Article, published under the heading "Specific-Purpose 'Energy Complex' Program," by RADYANS'KA UKRAYINA correspondent Ye. Krasnovs'kyi, Kiev Oblast: "Proving Ground for Proficiency: Report on the First All-Union Competitions of Power Generating Unit Shift Operators, USSR Ministry of Power and Electrification, at the Tripole GRES"]

[Text] "The generator unit was down for 8 hours. Your job is to perform the requisite operations and switch the generator into the system. Time -- 23 minutes."

Leaving V. F. Skorobreshchuk, turbine unit operator at the Zmiyivs'ka GRES, to his own devices at the control panels, the judges proceeded to monitor his actions. The first All-Union Competitions for 300,000 kilowatt generator unit shift operators had begun, held at the UkSSR Ministry of Power and Electrification's training center at the Tripole GRES. The 140 competitors represented 26 state regional electric power stations from seven brother republics, who had come to Kiev Oblast for the individual and team championships. Just as in other competitions, the winners will be determined, while the first-place team will be awarded a certificate of merit of the USSR Ministry of Power and Electrification and the Central Committee of the branch trade union, plus a challenge cup and a Kubanets microbus. But the main thing is that the competition will enable the organizers to compare the level of power station operation and, revealing the best know-how, to disseminate it. For the competitors themselves this is the most effective form of improving their job skills, and of course it is a guarantee of mishap-free, economical generator unit operation.

My interlocutor, R. D. Tsyptsyura, is head of the department of simulator and teaching systems at the Kiev Institute of Automatic Control, and chief designer of the simulators on which the power station operators were now engaged in competition. He told me that he had worked a great deal of time on equipment. It had been necessary to overcome a great many difficulties. But the persistence of the creative people at the training center and the considerable assistance on the part of party organizations had helped achieve the goal.

"We currently have one combined and four local simulators, on which more than 500 persons have already trained," I was told by Yu. O. Petlenko, who is in charge of the center.

We should add that specialists are not only trained here, but also tested. On simulators, where their ability quickly to find a solution to emergency situations is tested; in the psychophysiological testing laboratory, where engineer-psychologists determine with the aid of tests a person's suitability for a given job.

One can scarcely exaggerate the importance of such preventive-effort procedures, for a single 300,000 thousand kw unit going down as a result of a malfunction is equivalent to losing the power consumed, for example, by a large city. It is not surprising that the designers of these simulators, including R. D. Tsyptsyura, UkSSR Academy of Sciences Academician G. Ye. Pukhov, UkSSR Minister of Power and Electrification V. F. Sklyarov, M. M. Krasnoshtan, general manager of the Tripole GRES, Yu. O. Petlenko, and others have been awarded the UkSSR State Prize.

"Many thousands of power engineering personnel are currently employed at power generating plants in this republic as operators, in charge of generator units, etc," I was told by S. V. Kolesnikov, director of the Main Data Processing Center of the UkSSR Ministry of Power and Electrification. "In connection with this, we are working on establishing a regional training center. A training center for nuclear power station personnel is to be established at the Odessa Nuclear TETs. Special facilities are to be established at all nuclear power stations and large-unit power generating plants."

But let us return to the competition. What do the participants and organizers expect of these competitions? Here are their replies.

V. D. Losevs'kiy, head of the state inspection department for operation of electric power stations, heat and power systems of the USSR Ministry of Power and Electrification: "We were the initiators of this competition. We saw them as an excellent opportunity for exchange of know-how among representatives of the brother republics, for each makes a substantial contribution to the development of our nation's economy and has its achievements. This is a good school not only for increasing job proficiency but also for internationalist indoctrination of power industry people."

A. V. Hrytsenko, UkSSR first deputy minister of power and electrification: "The tasks specified in the specific 'Energy Complex' program are presently being successfully accomplished in this republic. This competition is fostering this goal, for it was preceded by competitions at all power stations in the republic. They ran 7 months, and this made it possible to improve the level of qualifications of hundreds of power industry personnel."

M. K. Musayev, senior engineer-inspector at the Azerbaijan GRES: "Our station is new. Two units are in operation, and a third will come on-line by 7 November. We need personnel. These competitions are a good school for training them."

L. F. Nikanorov, deputy chief engineer for operations, Lukomlskaya GRES (Belorussia): "The competitions attest to the great capabilities of our power industry people. They will help boost the prestige of the profession."

V. G. Grigor'yev, deputy chief engineer for operations, Konakovo GRES: "We are approaching an important date -- the 25th anniversary of the movement for a Communist attitude toward labor. Its slogan is close to that of these competitions and is instilling a feeling of collectivism."

In the meantime V. F. Skorobreshchuk, operator from the Zmiyivs'ka GRES, completed his routine. He was not informed of his mark. Those are the conditions of competition. The competition is far from over.

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GENERAL

SYSTEM FOR SAFER DEEP-MINE EXCAVATION PROPOSED

Kiev RADYANS'KA UKRAYINA in Ukrainian 23 Sep 83 p 2

[Article, published under the heading "Winning an UkSSR State Prize," by UkSSR Academy of Sciences Academician V. Poturayev, recipient of an UkSSR State Prize: "Made to Order for the Miners"]

[Text] Almost two thirds of everything produced by mankind is connected with mining output. The minerals produced by the mining industry — coal, various metal ores, valuable minerals, and many other materials — form the basis of today's industry and future material and technological advances.

The principal mineral resources which lie close to the Earth's surface have now been practically exhausted. Therefore increase in mineral production is inseparably linked with growth in deep mining, increasing the size and number of underground mine workings requisite for moving miners, transporting minerals, and putting construction materials and equipment into the mine. Coal mines in the Donbass have to date reached depths of 1,000-1,500 meters, while some ores are being mined at depths of 3,000 meters and more. This is accompanied by increasing complexity of mining-geologic conditions of mine construction and mineral extraction: at great depths overlying rock strata exert enormous pressure. In addition, rock formations are frequently saturated with various gases, which apply considerable additional force and pressure to the rocks. Development of mine workings in such conditions involves deterioration of work safety and great difficulties.

Scientists and production people are faced with the difficult task of developing methods of predicting the behavior of rocks and developing mine workings under these conditions.

More than 20 years ago a group of scientists and engineers at the UkSSR Academy of Sciences Institute of Geotechnical Mechanics, the State Makeyevka Scientific Research Institute for Job Safety in the Mining Industry, the All-Union Scientific Research Institute of Mining Geomechanics and Mine Surveying, as well as from production organizations of the UkSSR Ministry of Coal Industry was tasked by the USSR State Committee for Science and Technology and the USSR and UkSSR Ministry of Coal Industry with solving this problem, which is of great importance for the nation's economy.

No country possessed experience or know-how in solving such problems.

The team of authors of "Stvorennaya osnov teorii, rozrobka i vprovadzhennya kompleksu efektyvnykh sposobiv prohnozuvannya stanu i provedennya hirnychykh vyrobok po napruzhenykh hazonasychenykh porodakh u hlybokykh shakhtakh" [Building the Foundations of Theory, Development and Adoption of an Aggregate of Effective Methods of Predicting Conditions and Excavating Mine Workings in Stressed, Gas-Saturated Rocks in Deep Mines] conducted a number of theoretical and in-mine experimental studies. This resulted in discovery of a new natural phenomenon of self-sustained failure of stressed gas-saturated rock, and formulation of the fundamentals of theory of occurrence of explosive rock failure, as well as formulation of methods of predicting the condition of rocks, which make it possible to predict their behavior at great depths in various mining-geologic conditions, and methods of performing mine excavation in such conditions.

The methods of predicting the condition of rocks as devised by the above-mentioned authors are presently being universally utilized in this country, as well as in Czechoslovakia, Poland, and elsewhere.

A great many suggestions have been proposed for preventing the possibility of explosive rock failure during mine excavation in complex mining-geologic conditions. Testing of proposed solutions revealed that their implementation makes it possible to reduce the frequency and force of such rock failure, but there remains the danger of such rock failure, with all its serious consequences. The authors of the above-mentioned study came forth with the idea of using special heading equipment to achieve controlled rock failure at the cutting face. Theoretical studies and in-mine experiments confirmed the possibilities of this proposal. The result was development of a special nonexplosive (continuous-miner) method of excavation in complex conditions at great depths.

The devised nonexplosive method and process of mine excavation in stressed, gas-saturated rocks not only totally eliminate explosive rock failure but also make it possible to increase tunneling rate 3-5-fold and to mechanize heavy heading operations.

The study has been deservedly nominated for a 1983 Ukrainian SSR State Prize in the field of science and technology.

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