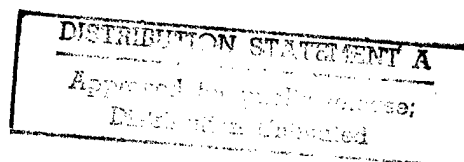


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OIL AND GAS

SHALE-OIL OFFICIAL INTERVIEWED ON REORGANIZATION OF INDUSTRY

Tallinn RAHVA HÄÄL in Estonian 29 May 83 p 1

[Interview of Valter Leini, chief director of the Oil-Shale Chemistry Production Association imeni V. I. Lenin by Mati Kalkun: "Where is the Oil-Shale Chemistry Industry Headed?" Passages in boldface enclosed by slantlines.]

[Text] [Question] /The basic directives for the USSR economic and social development include the statement that the oil-shale chemistry industry in the ESSR must be developed rapidly and major work be done to realign it. Valter Leini, Chief Director of the Oil-Shale Chemistry Production Association imeni V. I. Lenin, what does this mean in reality?/

[Answer] Inhabitants and visitors of Kohtla-Järve were until recently accustomed to seeing four smokestacks in the compound of our association; they were characteristic to the town panorama. Now there are three--one 79 meter tall stack was dynamited. In its place we are building a new generator. One gas generator with a thousand ton capacity is already working successfully. The most practical way to retrofit the association is the establishment of a new production complex that will have a capacity of three million tons of oil-shale annually. This amount of oil-shale will yield half a million tons of crude oil in the gas generators, the gas obtained as a byproduct will be used as fuel to heat the enterprise. The half million tons of oil will be used to produce chemical products valued at 40 million rubles. These include wood preservatives, anti-erosion preparations for the surface, fuel oil, oil coke, etc. Together with imported raw materials we also make all kinds of resins and other products valued at 15 million rubles. The startup of the new thousand-ton generator is very important from the standpoint of the combine's technical progress, since low-yielding machinery has to be replaced. But one must remember that the thousand-ton generator was built by the production association alone, only occasionally was it possible to use a specialized installation organization. Future technical retrofitting of oil-shale processing must take place much faster. The construction of modern oil-shale processing plants is very labor intensive and here the forces of planners and builders must be brought together, as was done in the building of the compound fertilizer plant. Along with the large gas generators and powerful condensation system must be built, as well as automated oil-shale storage facilities, conveyor galleries, hydraulic devices to remove ash, maintenance capacity must be expanded, etc. Problems associated with building large non-standard complexes and apparatus must be solved.

All of this was discussed at an All-Union meeting held in Kohtla-Järve 24-26 May. Scientists from Moscow, Leningrad, Minsk, Kirov, Tyumen and many other USSR cities said unanimously that an increase in the effectiveness of oil-shale chemistry is a task that must be met without question. We hope that this too will contribute to the rapid development of our oil-shale chemistry.

Question /How do scientists help you?/

Answer Oil-shale is a peculiar raw material containing organic and inorganic substances and yielding all kinds of valuable chemicals through distilling. Some of them compare favorably to parallel products of the oil industry, but most of them are organic compounds that are not obtained from any other natural resource. This includes primarily oil for treating railway ties, the chemical meliorative compound "Nerosiin," tampon mixtures to strengthen oil drillholes, tanning products for the leather industry, additives for rubber tires, resins, mastics, and other chemical products. We are producing all of them thanks to the work of the oil-shale institute scientists. But in our opinion there is little attention paid in the ESSR to the problems of developing the oil-shale industry--the resources of the Institute for Scientific Study of Oil Shale are not enough. It seems that topics related to oil-shale do not play as important a role in the plans of the ESSR Academy of Science institutes as they should. Criticism that is levied at the oil-shale industry (such as regarding the low usage of the ashes from the solid fuel heat transfer device) are justified, but little good comes from merely pointing out deficiencies. Joint concrete efforts are needed to solve the problems that have been identified.

Question /What part does the Estonian oil-shale chemical industry play in the world?/

Answer The importance of solid fuel is rising throughout the world. For this reason there are increasing visits by foreign engineers and business circles to our oil-shale installation. We have something to show them. We must do everything in our power to assure that the priority in the processing of oil-shale will remain firmly in the hands of Soviet scientists and engineers.

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COAL

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SUMMARIZATION OF STATUS, PROSPECTS OF SOVIET COAL INDUSTRY

Moscow UGOL' in Russian No 8, Aug 82 pp 3-7

[Article by B. F. Bratchenko, minister, USSR Ministry of the Coal Industry:
"For the Mining Industry - An Exemplary Order"]

[Text] This year the workers of the coal industry are celebrating their professional holiday, the Day of the Miner, in a hard-working vigil in honor of the 60th anniversary of formation of the USSR. During these 60 years enormous progress has been attained in the coal industry, being transformed into one of the leading branches of heavy industry, becoming a highly important part of the fuel and energy complex of the country. During this period the production of coal increased from 11 million tons in 1922 to 714 million tons (anticipated) in 1982 and the most progressive stripping method had an output increasing from 150,000 tons to 280 million tons annually. Such an increase is the result of the scientific and technical revolution in the coal industry, in which today, in an integrated complex, there is production and processing of coal and shale, designing and construction of enterprises, designing and production of mining equipment. Workers and other personnel are being taught and trained and major scientific investigations are being carried out.

The Communist Party and the Soviet government in all stages of economic construction have devoted primary importance to the development of the coal industry and have devoted enormous attention to the needs of miners. A new indication of this was the decrees adopted in 1981 by the CPSU Central Committee and the USSR Council of Ministers entitled "Measures for Accelerating the Technical Reoutfitting of the Mines of the USSR Ministry of the Coal Industry," "Additional Measures for Accelerating Development of Coal Production by the Stripping Method in 1981-1990" and "On Increasing Tariff Rates and Official Rates of Pay and Improving the Organization of Pay for Workers and Employees of the Coal (Shale) Industry and Mine Construction."

These fundamental documents outline a complex of measures for the further increase in the volumes of production or processing of coal, increasing the efficiency of production and improving the material stimulation of the workers.

One of the important, and at the same time, complex problems placed before the coal industry by the 26th CPSU Congress for the Eleventh Five-Year Plan is the ensuring of an increase in the production and processing of coal for the

most part due to an increase in the productivity of labor. The exceptional importance in solving this problem is due to the need for meeting the constantly increasing needs of the national economy for fuel under conditions of limited possibilities for drawing upon additional work resources and also the overcoming of the dropoff in the productivity of labor of workers allowed during the Tenth Five-Year Plan in the branch as a whole and especially in the underground production method.

Technical progress in the mines during the last 15-20 years has occurred primarily by means of complete mechanization of cleaning work, improvement in methods for the implementation of production by combines and provision for the total conveyerization of the transport of coal. A considerable technical potential was created, making it possible to ensure the required increase in the volumes of coal production, an increase in the productivity of labor of workers and a decrease in operating expenditures at mines.

However, in the development of the underground method for the working of coal deposits at the present time there are substantial difficulties associated in a number of cases with an underevaluation of the quality of planning decisions on mining work in enhancing the overall technical level of production, as a result of which favorable conditions have not been created everywhere for the effective use of new mining technology, an improvement in the results of operation of mines and an increase in the work safety of miners. Accordingly, in the decree of the CPSU Central Committee and the USSR Council of Ministers entitled "Measures for Accelerating the Technical Reoutfitting of the Mines of the USSR Ministry of the Coal Industry" it is pointed out that one of the principal directions in the technical progress of the branch is an improvement in mine management.

This is particularly important now when in connection with the shifting of underground work to deeper horizons there has been an appreciable worsening of the mining and geological conditions for the working of strata in the main coal basins. At the beginning of 1982 at 73 mines coal was produced at a depth greater than 800 m. Among the 643 mines (technical units) of the branch 394 are "supercategory" and category III with respect to the abundance of gas, including 236 in the Donets Basin.

In 1981 at 150 mines in the Donbass, Kuzbass, Karaganda, Vorkuta and Far East mines strata have been worked which have a tendency to sudden coal and gas "bursts." During recent years there has been an increase in the percentage of thin and extremely thin strata worked by the underground method. In 1981 in the main basins it attained 43% of the total number of worked mine strata and in the Donbass -- 73%.

An improvement in management of these mines is now the most important reserve for improving the indices of their operation and increasing the work productivity of workers; it must be brought about by a lessening of the use of so-called stepped schemes for the opening-up of new horizons, especially in the mines of the Donbass with gently sloping strata, a gradual changeover to the opening-up of new horizons by means of deepening of mines already in operation or the driving of new shafts in the place of stepped slopes. Development of inclined field strata represents the safest and most efficient method,

if individual transport and ventilation levels are organized in the mine. In the immediate future the development of mines must proceed on in this direction and for its realization in the current five-year plan more than 2 billion rubles are being allocated.

Selection of technological schemes for developing seams should be approached with greater care, with allowance for seam bedding specifics. During the last decade in the Donets, Karaganda and Pechora Basins extensive use has been made of the technology for the working of gently sloping (up to 10-12°) beds by rising (dipping) drifts, which in many cases has ensured an improvement in the technical-economic indices of operation of the mines (reduction in the specific volumes of mine excavation, increasing the loads on the cleaning faces and concentration of mining work). However, the accumulated experience in the use of this technology has also revealed its shortcomings. For example, standard-produced mechanized equipment cannot always operate effectively at the cleaning faces advancing along a rise (dip) of a bed with angles greater than 8-10°. Due to the lack of reliably operating ground, suspended and monorail tracks for the mechanized delivery of people and equipment, until now there has been no solution of the problem of auxiliary transport in sloping mine excavations adjacent to the cleaning face. Despite the simpler scheme for the planning of mine workings, this technology in a number of cases has proven to be complex in its execution, particularly in the working of gas-bearing beds, since it requires making dead-end preparatory workings of a great (up to 1.5-2 km) length. The scientific research institutes of the branch must analyze the experience accumulated in the working of beds by rising (dipping) drifts and give recommendations on improvement and the rational field of application of this technology and the pertinent parameters.

In order to improve mine management it is highly important that there be further broadening of the pillarless scheme for the working of beds. In 1981 these scheme was employed in the production of 52% of all coal. The pillarless working scheme was best developed in the Karaganda, Pechora and Donets Basins where its use made possible the annual additional extraction of up to 15 million tons of coal earlier irreversibly lost in the pillars, a reduction in the specific extent of the workings driven by a factor of 1.2-1.5, and in individual cases a reduction in the danger of rock collapse, sudden "bursts" of coal and gas and endogenous fires. The pillarless technology for mining work is progressive and it must be developed under all mining, geological and technical conditions, especially at great depths where pillars with a width of even as much as 70 m do not ensure the safety of the workings.

Particular attention must be devoted to improvement in the most effective method for the pillarless working of beds -- with the repeated use of preparatory workings, which is now done primarily in thin and moderately thick beds with stable or moderately stable country rock. The cross-sectional area of repeatedly used workings must be not less than 12 m², the width -- 4-6 m. For such workings it is preferable to have metal shorings with a supporting capacity of 200 kN in a frame with a compliance up to 1,000 mm. It is also necessary to ensure the large-scale production of strengthening shorings of the friction support and hydraulic types with supporting capacities of 300-400 kN. In solid country rock in order to safeguard repeatedly used mine workings, especially

in thin beds, it is necessary to use artificial strips of reinforced concrete blocks, poured concrete strips and other methods.

It is necessary to develop reliable methods for insulating the worked-out areas against air leakage in spontaneously-igniting strata of moderate or great thickness in the Karaganda, Pechora and Kuznets Basins. Existing technical solutions for the time being provide no complete guarantee against spontaneous ignition of coal, even when only a small quantity is left in the worked-out space. Also, work with endogenous fires when working beds without retention of coal pillars is complicated by difficulties in erecting insulating barriers.

In cases when it is impossible to preserve workings for repeated use (weak country rock, great thickness of bed), the preparation of excavation shafts must be accomplished using workings cut at an angle or workings formed behind a drift in the worked-out space. The removal of rocks by these preparation methods is almost twice as less as in the case of repeated use, but there is a considerable increase in the specific volume of work involved in making preparatory workings.

The pillarless scheme favors the concentration of cleaning work and the creation of conditions for accelerating the preparation of new excavation shafts. Under appropriate conditions there must be a changeover to the preparation of "panels" and excavation shafts directed along a rise (dip) with the use of intermediate mine workings, which will make possible a doubling of the concentration of mining work and a decrease in the length of time required for the preparation of new horizons.

In the mines of the branch there is a broadening of the field of applicability of the most progressive working system -- with long shafts and roof "total collapse" control. The percentage of coal production with the use of this working system increased from 72.7% in 1975 to 77.3% in 1981. In the Kuznets, Pechora, Karaganda and Moscow Basins the changeover to the shaft system has been completed. In the Donbass, where the percentage of coal production in this working system at the present time is only 63%, it must be increased. An analysis of the computations made indicates that in the system for the working of beds with long shafts the load on the cleaning face and the productivity of labor of a worker under similar mining conditions is 15-35% higher than in the case of the continuous method.

An improvement in the system for working with long shafts under existing geological engineering conditions of bedding is possible by ensuring a straight-through ventilation of the excavation sector and the freshening of the ventilation air emanating from the cleaning face. This will make it possible to increase the load on the cleaning face (with respect to the gas factor), decrease the operational losses of coal and increase work safety in the excavation sectors. However, in the mines of basins in the country this ventilation scheme is still not employed to an adequate degree.

Shaft systems with a straight-through ventilation scheme are particularly effective in the working of beds with a tendency to sudden "bursts" of coal and gas, spontaneous combustion and dangerous tendencies for rock collapse, since in this case it is possible to carry out regional measures, to degas partially the

zones adjacent to the constructed workings and to eliminate the sectors at the ends of drifts which are most dangerous with respect to rock and gas "bursts."

The engineering and technical workers at mines and combines must stubbornly work on the introduction of the progressive technological schemes for the working of coal beds approved by the USSR Ministry of the Coal Industry based on rational technical decisions for the entire range of mining work for the preparation and working of excavation sectors and making provision for the broadest application of the most efficient mine working systems, safeguarding of mine workings without leaving coal pillars and multisided mechanization of cleaning and preparatory work with adherence to their optimum parameters. On the basis of application of these technological schemes, during 1982-1985 it is necessary to increase the percentage of progressive working systems up to 80%.

An important direction in the improvement of mine management is the introduction of measures for maintaining the workings in an operational state during their entire lifetime. A factor of great importance in the solution of this problem is the introduction of efficient methods for the shoring, preservation and maintaining of the workings. It must be noted that during the last 10 years in the coal mines there have been considerable changes in the technical outfitting of work for the preservation and maintenance of mine workings. The extent of the workings reinforced by metal, reinforced concrete and tie rods during the period from 1970 through 1981 increased from 53 to 80% of the total length of the maintained workings. The branch institutes have developed new types of shorings with an increased supporting capacity and compliance with new "locks," and also norm-setting documents on the choice of rational means and methods for maintaining mine workings.

However, the condition of workings in the mines of some combines continues to remain unsatisfactory. In comparison with 1975 the extent of the workings not corresponding to shoring specifications in their parameters has increased at the combines "Vorkutaugol'," "Stakhanovugol'," "Severokuzbassugol'." The combines "Ordzhonikidzeugol'," "Artemugol'," "Pervomayskugol'" and "Shakterskant-ratsit" must devote more attention to the condition of the workings adjacent to the cleaning faces in the working of coal beds at great depths.

At many mines in the formulation of projects for the safeguarding and shoring of mine workings no allowance is made for the effective positioning, safeguarding and maintenance of coal mine workings and standard specifications for the safeguarding, shoring and maintenance of prepared workings without leaving pillars. In 1981 the extent of the workings reinforced in accordance with these specifications was approximately 560 km, that is, only about 30% of newly driven workings and 18% of the total extent of the maintained prepared workings. It is necessary to continue work on increasing the cross-sectional area of workings adjacent to the cleaning faces to 16 m².

In many cases the changeover to the pillarless working of beds is accomplished without taking into account the required shoring parameters when maintaining workings at the boundary with a worked-out space, that is, without a

corresponding increase in supporting capacity and compliance. In a number of cases in the pillarless working method use is made of timbering without its reinforcement at the joining with a drift. As a rule the strengthening shoring of the friction and hydraulic types is not installed along the entire length of the bearing pressure and shearing zones, but only in the sector of joining of drifts.

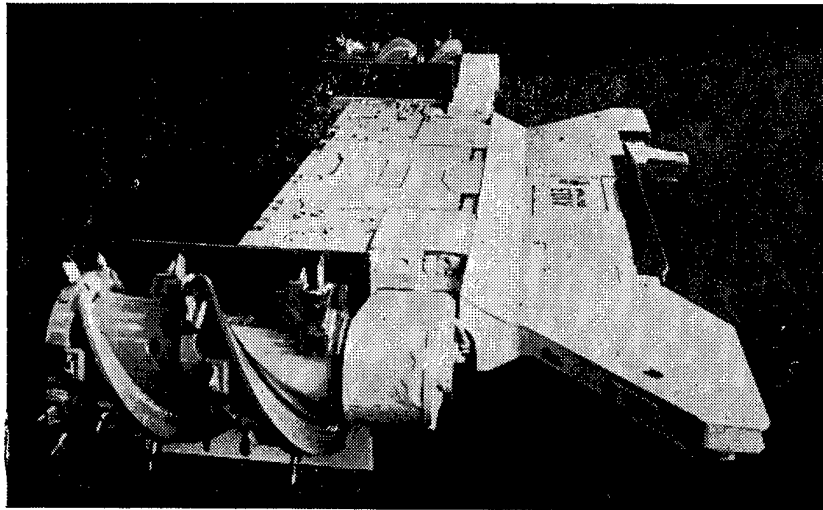
The AP-3 metal arched three-link shoring extensively used at the present is not sufficiently perfected and its fittings do not ensure the required supporting capacity. In this connection there is a need for more rapid industrial production and introduction of new shorings of the MPK, MIK and KPS types with an increased supporting capacity and compliance.

Assurance of a satisfactory maintenance of mine workings should be primarily the task of engineering and technical workers of sectors, mines and combines who bear the responsibility for the quality of driving, reinforcing and maintaining mines. There are examples when well-conceived planning and positioning of mine workings and properly selected methods for the shoring and safeguarding of mine workings make it possible to achieve their accident-free maintenance during their entire lifetime and there is thereby an assurance of a high productivity of the cleaning faces. For example, at the Kostenko mine of the "Karagandaugol'" combine (chief engineer P. P. Nefedov) until recently excavated workings had a cross-sectional area not greater than 7 m². This did not make possible a rational placement of transport equipment and made difficult the performance of operations at the end of drifts; shorings were deformed and thereby held back the efficient working of faces. With the driving of workings with a cross-sectional area of 12 m² or more there was a considerable improvement in their condition and it became possible to work cleaning faces without niches and the work load in the drift increased by 20-25%. In the Lutuginskaya-Severnaya mine of the "Voroshilovgradugol'" mine (chief engineer Yu. I. Orlov) the AP-3 arched shoring has been replaced by MPK metal compliant shoring with boltless joining of segments, which made possible elimination of upward blasting of the roof when driving drifts and considerably improved the joining of drifts to mine workings. At the "Abashevskaya" mine of the "Yuzhkuzbassugol'" combine (chief engineer G. F. Kolokol'tsev) and the hydraulic mine "Yubileynaya" of the "Gidrougol'" combine (chief engineer P. A. Natsarenus) up to 90% of all the driven mine workings are reinforced by tie-rods, as a result of which there was an improvement in the condition of the workings, a decrease in expenditures on preparing them and an increase in the rate of their construction. There has been a creative solution of the problems involved in improving the condition of the mine workings at the "Nagornaya" mine (director V. M. Yerpylev) and "Alardinskaya" mine (director V. I. Shundulidi) in the Kuzbass, and others.

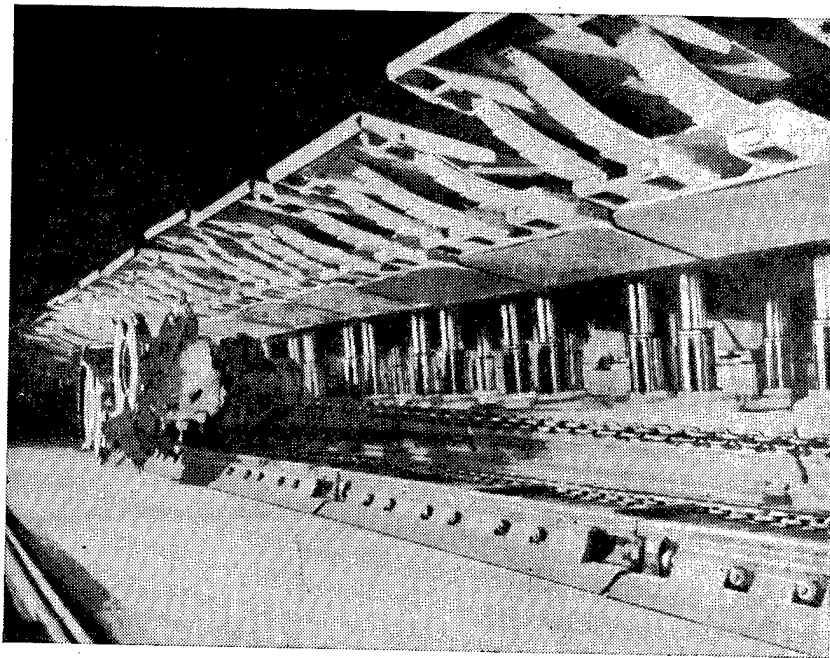
The following are necessary for the further improvement of the means and methods for shoring, safeguarding and maintenance of mine workings:

-- at all mines there is need for introducing standard specifications for the safeguarding, shoring and maintenance of preparatory workings without pillars;

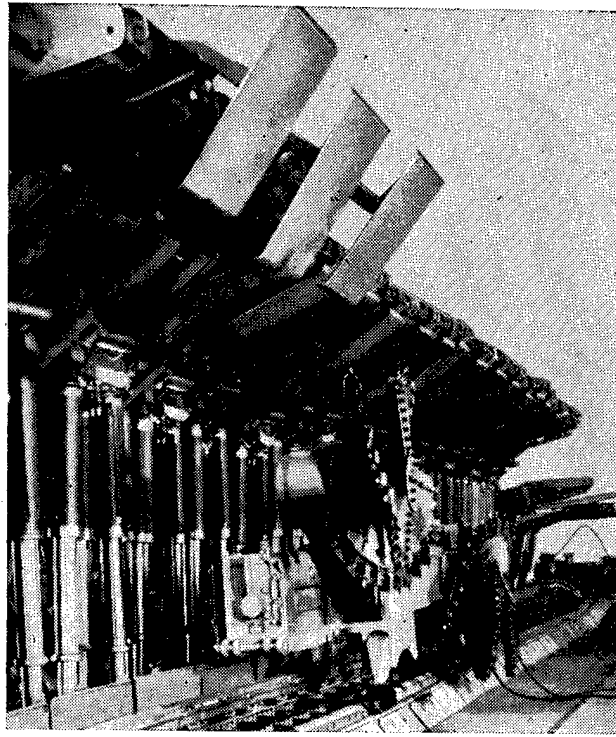
-- the All-Union Scientific Research Institute of Mine Surveying and the Mining Institute imeni A. A. Skochinskiy and basin institutes must render assistance to mines in the choice of specifications, in generalizing experience and developing proposals for their further improvement;



K-103 combine for KM-103 mechanized cleaning complex.



KMT mechanized cleaning complex.



1UKP mechanized cleaning complex.

-- the Ukrainian Ministry of the Coal Industry, the "Kuzbassugol'" production association and the "Novomoskovskugol'" combine during 1982-1985 must fabricate shorings of increased strength and compliance in the quantities planned by the USSR Ministry of the Coal Industry; Soyuzuglemash plants must increase the volumes of production of supports of the friction and hydraulic types for reinforcing shorings, as well as metal posts of the OKU type and the "Titan" crushing-laying complex;

-- under complex geological mining conditions it is necessary to drive workings of an increased cross-sectional area;

-- there is a need for creating shorings and safeguarding methods ensuring maintenance-free upkeep of the mine workings;

-- the volumes of shoring of workings by metal and other effective supports by 1985 should attain 86%, and by 1990 there should for the most part be completion of the replacement of timbering by metal and reinforced concrete shoring;

-- work must be completed on the industrial mastery of mechanical and chemical methods for the strengthening of country rock.

An important role in the improvement of mine management is played by an increase in the concentration of mining work and an increase in its most important index: loads on the cleaning face. Measures for the technical reoutfitting of mines in the branch provide for an increase in the Eleventh Five-Year Plan for loads on the working cleaning face to 450 tons/day and at a complexly mechanized face

to 700 tons/day. For this purpose during 1982-1985 it is necessary that the number of mechanized complexes of a high technical level (KM-103, UKP, KMT, AK-3, KM-130, KM-88 and others) in operation, corresponding in their technical specifications to the prevailing geological engineering conditions and an increased productivity, be increased to 70% of their total number; it is also necessary to create joining supports ensuring a reliable support for the roof in zones of active bearing pressure; there must be improvement in all technological links of the mine (lifting, transport, ventilation, etc.).

At the present time one of the reasons for the inadequate efficiency in work at cleaning faces is standstills due to the collapse of weak country rock, complex hypsometry, irregularities of the bed and other geological features. During recent years the method for strengthening unstable rocks and coal with hardening compounds by direct injection and using "ampules" in combination with tie-rods has recommended itself well. The method developed by the Donbass Coal Mining Institute for reinforcing weak rocks of the roof and the junctures of drifts with steel rods strengthened along the entire length by polyurethane foam is used at more than 100 cleaning faces at mines in the Donbass. Although the work carried out in different mines and for different purposes on the strengthening of rocks and coal by the injection of strengthening compounds gave positive results and confirmed the good prospects of this method it has not yet come into adequate use.

Under conditions of a considerable concentration of cleaning work accidents at one highly productive face and a standstill of production over the course of a shift or more lead to an interruption of the production program for the mine and even the combine. Accordingly, a concentration of production should provide first and foremost for an increase in the reliability of functioning of elements of the system (machines, mine workings, etc.) by an improvement in designs, an improvement in the quality of fabrication and its technical servicing, and also assurance of the reliability of the entire system by duplication of its elements. At mines outfitted with highly productive cleaning complexes and assemblies it is necessary:

- to develop cleaning fronts that ensure a reserve of coal supplies ready for excavation for not less than 6 months with the gallery method, and for a year with stepped or panel working;
- two months prior to ending of work in a highly productive longwall, it is necessary to prepare a new completely equipped longwall;
- each three or four operative highly mechanized faces should be backed up by one reserve face with the organization of work in one shift.

In order to better the state of mine management it is necessary to eliminate the dispersal of mining work in mines, to concentrate this work in the smallest possible number of beds, horizons and levels, to establish the optimum dimensions of the excavation fields. An important role in the solution of these problems should be played by general schemes for the defining of mine fields during the period up to 1990, developed for all mines of the branch and approved by the USSR Ministry of the Coal Industry as the fundamental document

for the planning of mining work over the long run. These schemes take into account available leading experience in work and the attainments of science with respect to the most rational order for implementation of mining work.

In order to ensure further improvement in mine management the USSR Ministry of the Coal Industry has developed purposeful multisided branch programs for the future. The programs provide for the carrying out of a great volume of scientific research and experimental design work for improving the planning of underground mining work and ensuring the concentration of production, improvement of mine preparation work and the introduction of new methods for the shoring, safeguarding and maintenance of mine workings, the creation and introduction of new technologies and means for the multisided mechanization of work for different geological mining conditions ensuring an increase in the load on the cleaning faces and an increase in the productivity of labor of workers.

It is necessary that both scientists and production workers work seriously on solution of the problems outlined in the programs. They must examine the problems involved in the concentration of production, evaluate the technical and economic level of operative mines, formulate proposals on decreasing the number of inefficiently operating enterprises and improve technical and economic indices.

It is also important to improve mine management in strip mining, since this coal production method is developing at a rapid pace: there has been an increase in the volume of coal production by rotary excavators and the most economical transport-free system of mine workings and there is an increase in the mean thickness of the coal working. In stripping work use is made of dump trucks with a carrying capacity of 120-180 tons, considerably simplifying the organization of movement in the pits. The use in railroad transport of traction units with a coupling weight of 240-360 tons, having an independent power source, not only made it possible to increase the capacity of available locomotives, but also to preclude the need for constructing contact networks for movable tracks.

In addition, the rates of increase in coal production exceed the rates of increase in the volumes of stripping work. This has been caused by a considerable decrease in reserves prepared for excavation. As a result, there has been a decrease in the working areas of the levels and this has complicated the organization of stripping and production work and has led to a decrease in the productivity of mining and transport equipment.

At some stripping operations there has been an excessive extending of the front for stripping and production work and this has led to a great drawing out of transport and power lines or has complicated the administration of mining work.

In order to increase the volumes of production of coal by the stripping method it is necessary to create and introduce new progressive technology and mine transport equipment of a high unit capacity; fully mechanize and automate production processes; decrease the use of manual labor; adopt measures for the elimination of the lag in implementation of stripping work.

By 1985 the production of coal by the use of rotary excavators should be at the 47% level; there will be an increase in the volumes of the most efficient working systems -- untransported and transport-waste dump -- with the use of equipment of the cyclic and continuous action types with a high unit capacity.

At strip mines at the present time the partial movement of rock into the worked-out space by means of an explosion is being introduced and engineering decisions are being applied for increasing the stability of internal waste dumps and making it possible to place them on a foundation with an angle up to 20°; the level of mechanization of auxiliary work is being increased by the creation and introduction of machines and mechanisms for track and explosive work, for the mechanization of loading and unloading operations at storage warehouses, for repair work, for the application of protective coatings against sticking and freezing of rocks to the working surfaces of mining and transport equipment, etc.

During the Eleventh Five-Year Plan and in the long run the branch is faced with very serious tasks in the further increase of the volumes of coal production.

A highly important prerequisite for the further improvement in technological processes in the underground and stripping methods of coal production is the creation of effective management of underground and strip mines. The optimum planning and concentration of mining work, a reliable cleaning front and a good state of the prepared workings will make possible successful implementation of measures for the technical reoutfitting of underground and strip mines. All this will ensure the necessary increase in the productivity of labor and will make a weighty contribution to solution of the tasks placed before the coal industry by the 26th CPSU Congress.

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SOME PROBLEMS IN DEVELOPMENT OF KUZBASS COAL INDUSTRY

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[Text] The high quality of Kuznetsk coking and heat-producing coals, their transportability and relatively low cost predetermined a subsequent demand for these coals, according to "Energoset'proyekt" data by a factor of 1.7-2. Despite the potentialities of the raw material base, in the Kuznetsk Basin there has been a reduction in the rates of increase in the volumes of coal production; moreover, beginning in 1978 there was also a dropoff in the absolute level of its production.

An analysis of the reasons for slowing of the rates of increase in Kuzbass development indicated that in the preceding years in this basin there was a reduction in the initial exploitation of new coal-producing strata and as a result there was an increase in the depth at which work was carried out at operative enterprises. The increase in depth of working exerted a negative effect on the technical and economic indices of work in general in the Kuzbass; there was an increase in the time required for the preparation of new horizons in operative mines and in worked sectors. However, during the period 1970-1975 the work productivity of workers employed at the coal industry enterprises of the Kuznetsk Basin increased by 32%, which corresponded to its annual increase by 5.7%. An important role in this was played by the expanded use of mechanized complexes and the development of coal production by the strip method. During 1975-1980 the increase in work productivity of miners in excavation work in the Kuzbass ceased. This to a considerable degree was attributable to the limited possibilities for the further use of mechanized complexes in operative mines, low rates of development of strip mining work, as well as the absence of new coal-producing strata, which should be developed in explored reserves with favorable geological conditions for mining.

Increases in the stock of highly-mechanized equipment in the basin are outpacing the development of the maintenance and reconstruction facilities.

The enumerated circumstances require the multisided solution of increasing coal production and improving technical-economic indices. Investigations have shown

that the realization of the measures proposed for this purpose involve the organization of major construction in the Kuzbass. The previous orientation on other types of fuel in the system of the fuel-energy complex of the nation was unquestionably reflected not only by the rates of development of the coal industry as a whole, but also by the development of the most promising coal-producing basins. In the Kuzbass the slowing of the rates of development has been caused also by a chronic underinvestment of capital. The plan for capital investments for 1976-1980 was met by 86% by the miners of the basin, including 79.6% for construction-erection work, which was only 97.8% of the 1971-1976 level. This was reflected in the volumes of introduction of new facilities for coal production and the modernization of facilities.

The principal reason for the situation which prevails is an inadequately well-developed mine construction base in the basin.

Most (87%) of the construction work on coal industry projects in the Kuzbass is accomplished by the workers of construction organizations of the USSR Ministry of the Coal Industry. A total of 58% of the work is performed by the "Soyuzshakhtostroy" construction association ("Kuzbassshakhtostroy" and "Kuzbasszhilstroy" combines), 29% -- by coal production combines, and 13% by organizations subordinate to other ministries. The results of the Tenth Five-Year Plan indicated that the annual plans for construction-erection work by mine construction organizations have not been met and between 1976 and 1980 the "Kuzbassshakhtostroy" combine, the principal contractor for mine construction, allowed a systematic decrease in the volume of work to the earlier attained level. Among the serious shortcomings in the organization of construction work in the mine construction organizations of the basin are the following: an inadequate number of workers at construction projects and enterprises of the construction industry; a low level of industrialization and mechanization of construction work; an inadequate concentration of work caused by the dispersal of resources among numerous construction projects.

Despite a small absolute increase in the number of workers engaged in construction for the basin as a whole, during the Tenth Five-Year Plan at the "Kuzbassshakhtostroy" and "Kuzbasszhilstroy" combines (the principal mine construction organizations) the number of workers not only decreased, but there was a deterioration in skill levels. A particularly great outflow of workers from the construction organizations of the USSR Ministry of the Coal Industry in the Kuzbass was observed in 1976 when their numbers decreased relative to 1975 by 10% (according to data of the Kemerovo Oblast Statistical Administration). This was associated with the reorganization of the Administration of Construction Work of the USSR Ministry of the Coal Industry in the basin. The lack of definite advantages in the field of wages and more difficult working conditions than for workers of other occupations did not favor an inflow of workers and led to the need for attracting workers by organized and unorganized recruitment. The skills of construction workers sharply deteriorated, which was a reason for a decrease in the rates of growth in work productivity. A reduction of the number of workers engaged in the construction of new mines and the elimination of mine construction trusts and special construction services at mines fragmented the resources of mine builders on small projects for the maintenance of existing facilities and sharply increased the number of people engaged in mining work. A change in the structure of mine construction work resulted in a decrease in the total number of miners.

Investigations show that despite a decrease in the percentage of manual work at the construction organizations of the USSR Ministry of the Coal Industry, in the Kuzbass in the production of concrete and reinforced concrete work, and also in plastering and painting, the small-scale mechanization of the mine builders of the basin remains low even in comparison with similar organizations of the USSR Ministry of the Coal Industry in other regions and the organizations of other departments located in the Kuzbass. For example, the mechanical equipment of one worker in construction-erection work in auxiliary trades, accordingly to report data of the USSR Ministry of the Coal Industry, at the "Kuzbassshakhtostroy" combine is only 81% of the corresponding index for the "Ukrshakhtostroy" combine and at the "Kuzbasszhilstroy" combine it is 71% of the index for the "Glavkuzbasstroy" combine of the USSR Ministry of Heavy and Transport Machine Building (carrying out similar work). The percentage of the active part of the main production funds for construction purposes at the "Ukrshakhtostroy" combine is 66.4%, whereas for the "Kuzbassshakhtostroy" combine this index does not exceed 59.5%, and for the "Kuzbasszhilstroy" combine it is 51%. The intended increase in the mechanical outfitting at Kuzbass organizations, according to report data for the Tenth Five-Year Plan, does not reflect the actual situation, since during recent years there has been a rise in cost of road building equipment. In reality, the mechanized construction equipment available per 1 million rubles of construction-erection work is constantly decreasing. It should be noted that the percentage of fully prefabricated construction in the building of coal industry facilities in the basin for the time being is still not above 40%. The problems involved in the unification and standardization of the main parameters and construction parts of buildings and structures at the surface are being solved slowly. There is a virtual total absence of standard projects and block diagrams from which it would be possible to design buildings and structures for different purposes, depending on the capacity of the coal enterprises. Light metal "prepackaged" construction elements have not yet come into use.

The capabilities presently at the disposition of Kuzbass mine builders for the production of prefabricated reinforced concrete, metal construction parts, carpentry and a number of other items, if planning indices are used as a point of departure, could satisfy the existing needs of construction projects for the planned volumes of work. However, due to the absence of specialization caused by the fragmentation of the construction industry base, the production of an unjustifiably great number of varieties of items at one enterprise and a chronic shortage of workers these capabilities are by no means being fully used. Suffice it to mention that at the Abagurskiy Plant for reinforced concrete items, the largest among those operative in the "Kuzbassshakhtostroy" combine, employing its productive capability less than 50%, the mean annual production per worker is lower than the average for the USSR Ministry of the Coal Industry by almost a factor of 1.5 and is 1.8 times less than for the "Glavkuzbasstroy" combine of the USSR Ministry of Heavy and Transport Machine Building.

All this has a negative effect on construction work. Not a single construction combine of coal workers in the basin has in its structure standard production-technological bases, a service for the "prepackaging" of construction elements and ready-to-use items delivered to the construction site. All this has a negative effect on the productivity of labor and rates of construction.

All these deficiencies in the organization of construction lead not only to a substantial underfulfillment of planned goals, but also an increase in uncompleted construction work. As already noted, with the existing type of planning this favors a dispersal of the allocated resources and an unjustified fragmentation of the capabilities of construction organizations.

A study of the processes transpiring in the Kuzbass, exerting an influence on the rates of development of the coal industry, reveals that the practical steps undertaken for the solution of individual problems do not reflect the fullness of the overall approach to the problem. Despite the great importance of the Kuzbass for the national economy, it in essence has never had an overall work program developed with involvement of all the interested ministries and departments and reflecting the prospects of its development. There has been no program giving an objective evaluation of its reserves, taking into account the problems involved in preserving the environment, removal and replacement of ground, development of transport, repair and machine building bases, construction work, etc. The existence of such a program would facilitate the keeping and attraction of workers. The national economy of Siberia has always been characterized by a strained balance of work resources and a shortage of workers. In the coming period, however, the situation will become more complicated and the search for ways to attract workers to the coal industry of the Kuzbass from the central regions of the country, as well as to reduce the leakage of population from the region, is becoming a highly important task. The construction base must be assigned a special place in the comprehensive program. The principles of its strengthening must be taken into account: the construction of buildings and structures, based on the broad use of ready-made elements undergoing preliminary preparation and assembly at the factory; broad use of metal, wood and light effective materials and a decrease in use of heavy materials and construction parts; construction of movable buildings and buildings which can be assembled and dismantled in a short time making it possible to establish well-structured settlements of construction workers; maximum mechanization of construction-erection work and transport operations with the use of both heavy mechanisms and small-scale mechanical apparatus; dispensing with the production of construction materials, construction parts and elements at construction sites and the organization of their production at construction industry bases with delivery to the construction site by efficient types of transport; organization of underground and assembly repair of construction machines, mechanisms and means of transport employed in the construction of mines; combining of the construction capabilities of the USSR Ministry of the Coal Industry in the Kuzbass into an integrated territorial complex with direct subordination to the USSR Ministry of the Coal Industry, making it possible to eliminate duplication in the production of construction work and haulage of freight and facilitating the introduction of deep specialization; universal strengthening of the administrative construction method for the maintenance of existing capabilities and the freeing of the principal mine construction organizations for the construction of new enterprises.

The need to devise a comprehensive development program for the Kuznetsk Basin, objectively reflecting not only its technical possibilities, but also the material needs for its realization, will make it possible on a realistic

basis to make large-scale use of the reserves of Kuznetsk coals for the needs of the national economy and this will exert a favorable influence on the effectiveness of capital investments in the coal industry and on the rates of its development.

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