Selection of Coal Abstracts

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COAL INDUSTRY

7779
South Africa's coal export industry - past, present and future. In The fifth annual international coal trade
Weiss, L.H.M.
5. annual int. coal trade conf., Washington, DC, USA, 1-2 Apr 1985. Arlington, VA, USA, Pasha Publications, 21 pp (1985)
The past history of the South African coal export industry is presented in terms of geology, coal quality, coal reserves, coal utilisation and the development of coal exports. The present-day operation of the Richards Bay Coal Terminal is examined in some detail and the investment by the coal mining industry and the railways in export infrastructure outlined. The future of the export industry is considered, noting the influence that the nuclear power industry could have on coal. It is expected that coal sales in the international market will increase, due to carefully planned and implemented arrangements.

7780
Prospects for China's coal exports. In The fifth annual international coal trade
Sun Hao
5. annual int. coal trade conf., Washington, DC, USA, 1-2 April 1985. Arlington, VA, USA, Pasha Publications, 12 pp (1985)
China's aims to double coal output by the end of the century are discussed, with reference to the current coal import and export business. Export coal statistics are presented, and attention drawn to the present problem of transportation in China. Electrification and construction of railways is underway, and new terminals are being considered at Port Quinhuangdao in order to improve this. Coal exports are not expected to increase greatly due to increased domestic demand, except possibly in the foreign investor's share of coal. Coal is the predominant primary energy in China and the deposits are mainly dispersed in the north, resulting in a north to south movement of coal.

8552
Study of the economic and ecological and social effects of intensified hard coal utilization
Coenen, R.; Frederichs, G.; Halbritter, G.; Nieke, E.; Wintzer, D.
Glückauf; 121 (7); 543-557 (11 Apr 1985)
The consideration of economic, ecological and social aspects leads to the following conclusions : At least for the next 20 years, the high cost of coal gasification and coal liquefaction will make large-scale petroleum substitution improbable. From the environmental view, there are no objections as pollution levels would not increase, but the public acceptance of coal upgrading technologies may be a problem. Suitable petroleum substitution technologies are recommended in the following order : District heating from coal-fired heat-and-power plants in cities of more than 50,000 inhabitants, process heat from coal-fired steam boilers; district heating from small coal-fired heat-and-power plants (if possible with fluidized-bed combustion) in cities of less than 50,000 inhabitants, selected electric heating systems (e.g. powered from coal-fired heat-and-power stations) and monovalent electric heat pumps for low-temperature heat supply to industrial plants. (In German)

RESERVES & EXPLORATION
8612
Acoustic reflections from complex strata
Geophysics; 50 (7); 1100-1107 (Jul 1985)
Rock strata may contain fine-scale structures which are too small to be identified directly, but which can give rise to anomalous seismic reflection amplitudes. The variance caused by such anom-

alies severely hampers the use of reflection amplitudes for layer identification, and techniques are required which can identify or correct for the effects of such fine structure. The authors have done calculations which explore the consequences of two general structure types : wavy interfaces and very thin layers. Computer modelling of realistic formations (including coal seams as one example) verified these calculations. It is suggested that the strongly wavelength-dependent response of such layers and their characteristic response waveforms may provide convenient tools for identifying fine-scale features in strata.

8613
Exploration and mapping hardcoal deposits as a basis of mine planning
Sauer, A.F. and others
Glückauf; 121 (16); 1193-1199 (22 Aug 1985) Available in English in Glückauf + translation; 121 (16); 360-362 (22 Aug 1985)
The Ruhr coal measures are used to exemplify the exploration of deep coal deposits and their mapping for mine planning purposes. Reflection seismic methods are discussed, and in particular 3-D seismics which allow the trend of geological faults to be traced in great detail. Special mention is made of borehole logging which provides data on the strata sequence intersected by a borehole and complements the findings of core and mud samples. A description is given of the way in which seismic surveying and borehole logging are used in conjunction with mine plans to produce a model which is the basis for mine planning. (In German)

MINING

7852
Effects of seam floor hypsometry on output of working faces
Shcherbinin, A.S.; Seregin, Yu.I.
Ugol; (2); 14-15 (Feb 1985)
The Tula Technical Institute investigated effects of hypsometry fluctuations of the floor of coal seams on coal output per working face in the Podmoskovnyi basin in the USSR. Fluctuations of floor hypsometry and coal output of 624 longwall faces in 5 mines of the Novomoskovskugol' association were investigated from 1977 to 1981. Coal seams 2.0 to 2.5 m thick were mined by the OKP face systems. Equations which describe correlation of floor hypsometry and coal output were derived. Curves which describe effects of hypsometry fluctuations on coal output per 1 m working face were plotted. Analyses showed that under conditions of the Podmoskovnyi basin, change of angle of seam inclination (measured along working face) by 1 degree reduces coal output per face by 15 %. (In Russian)

7853
Present state and development in blasting technologies in mines
Gerhardt, H.; Baumann, K.; Richter, E.
Neue Bergbautech.; 15 (2); 45-54 (Feb 1985)
Reviews global aspects in development and application of blasting methods in underground and surface coal, ore and salt mines. Technological advantages of ANO and slurry explosives are outlined; various new ignition methods, which are safe to influence by foreign electrical sources are explained, including the Magnadet electric induction ignition as well as Nonel and Hercudet non-electric ignition methods. Firing patterns in underground road drivage are further compared, along with required dimensions of blasting holes. Application of computer technology for optimizing blasting procedures is also noted. Development of blasting technologies in mines of the GDR is discussed.(22 refs.) (In German)

7865
Ventilation shaft construction with preliminary grouting from the surface
Polozov, Yu.A.; Pshenichnyi, Yu.A.
Shakhtnoe Stroit.; (1); 19 (Jan 1985)
Describes the sinking of a shaft through water bearing rock at a Donbass mine. The depth of the shaft was 1085 m, clear diameter 6 m, and thickness of concrete lining 500 mm. A total of 366.2 m (34.2%) of the rocks encountered contained water, on 21 levels, with a total predicted influx of water of 178 m^3/h. Grouting was performed from the surface via a single borehole narrowing from 1020 to 295 mm diameter. A total of 15,915 m^3 of grouting solution was injected into the different levels. Details of the equipment and processes used to construct the shaft are given. A fast rate of 100 m/month was achieved thanks to a water influx of only 2-4.4 m^3/h (residual influx on completion of shaft 1.6 m^3/h). (In Russian)

7875
Face-end layout - adaptation to deposits (Report on ECSC contract 7220/AD/119)
Schuermann, F. (Steinkohlenbergbauverein, Essen-Kray (FRG)
EUR - 9638-DE Luxembourg, Commission of the European Communities, 64 pp (1985)
The research project aimed 1) at optimized face-end layout 2) at better matched coal-face and face-end operations. For optimized layout, a manual "Approaches to practical solution of face-end problems' was drafted to give more help in decision-making. This collection of 50 operation modes is subdivided into nine problem areas. For better matched operations, remote face-line monitoring by means of the shield support position indicator was developed successfully. Sensors were developed for monitoring various interactions in the face area; the sensors may be grouped in multiple units. Early warning systems for potentially dangerous developments in face-end areas were also developed. (In German).

7880
Shotcrete in roads and shafts of Bergbau AG Lippe
Thierse, D.
Glückauf; 121 (14); 1076, 1079-1082, 1085-1086, 1089-1090, (25 Jul 1985) Available in English in Glückauf + translation; 121 (14); 326-331 (25 Jul 1985)
Shotcrete has been used in mining for many years, and its applications are described. There are economic advantages in using a combination of bolting and shotcreting when constructing shaft landings and excavations of > 30 m^2 cross-section. Shotcrete had proved itself in drainage roads with water temperatures of 40-60 °C and NaCl contents of 10-12 %, and in strata stressed by other workings. Steel arch supports are reinforced by shotcrete, sometimes with steel needles. Methods of transport and packaging of materials are discussed. (In German)

7881
Drivage and final consolidation of an in-

cline in loose ground
Salvaudon, P.
Ind. Minér. (St.-Etienne, Fr.); 67 (6); 381-383 (Jun 1985)
The paper describes the use of a special concrete which was sprayed to provide roof support in an incline being driven at Provence Collieries. The route of the drift traversed greatly fractured limestone and marl, and the fall was 200 m. Traditional support measures were used, but the transition between limestone and marl, and the marl itself, required insulation against air and moisture as soon as they were exposed. The concrete developed for this application and the spraying technique used are presented. (In French)

7882
Improving development and mining in mining sections with increasing depth
Batmanov, Yu.K.; Poznyakov, G.G.
Ugol Ukr.; (2); 15-17 (Feb 1985)
Discusses effects of increasing mining depth on mining and strata control at working faces and in development workings. The evaluations concentrate on long pillar mining in rock strata prone to separation into layers. Analyses show that use of heading machines for mine drivage in coal seams surrounded by rock layers prone to separation is more economic than drilling and blasting. Gate roads should be driven without cutting the direct roof. Strata control in gate roads is efficient when steel supports are combined with roof bolts and with grouting. When a gate road is used by the following working face strips of stowing should be used for its protection. Mining systems without stable holes reduce hazards of intensive roof subsidence and deformation at face ends. A scheme for longwall mining using the KM-88 powered supports or the Donbass supports, the 1K-101 shearer loader and chain conveyors is analyzed. Recommendations for optimizing position of gate roads and other development workings in relation to working faces are made. (4 refs.) (In Russian)

7915
Main trends in modernization of mine roadway supports
Koskov, I.G.
Shakhtnoe Stroit.; (1); 3-5 (Jan 1985)
Presents a general review of work currently in progress to improve the quality of mine roadway supports. Up to 80 % of time and 60 % of cost of mine construction may be attributed to support work. Shaped steel supports account for 85.6 % of the total and concrete and reinforced concrete 8.6 %. The proportion of deformed supports in Donbass mines is over 50 %, and increasing by 2-3 % annually. About 14 % of underground workers are engaged in support replacement. Various reasons for this state of affairs are given. A program involving a number of mining institutes led to the development of new ways of supporting roadways, and these are listed. The need to use high resistance yielding supports to combat greater rock movement at deep levels is noted. The most important task is to mechanize support work; to this end VNIIOM-ShS has developed the Progress-1 system with tubbing sections erected by a support placer. Using this system, a rate of mine drivage of 500 m/month may be achieved, with productivity of 1 m/man and shift. (In Russian)

7918
New methods of grouting behind supports in mine roadways
Zaslavskii, I.Yu.; Faivishenko, A.G.; Borodulya, N.F.
Shakhtnoe Stroit.; (1); 11-14 (Jan 1985)
Presents several new methods aimed at increasing the speed and efficiency of grouting work. The bearing capacity of a grouted thickness of 1-1.5 m is 2500-3000 kN, which exceeds that of a metal arch support by 10-15 times under real conditions. Some time and motion studies on grouting work are described, and examples given of various grouting procedures applied in Donbass mines, with various distances behind the advancing face. Phosphogypsum is recommended as the most efficient grouting material, enabling a grouting speed of 6 m^3/h to be achieved. The method of placing plastic frames behind the lagging boards and pumping in grouting solution is described; when a Monolit-2 pumping unit and phosphogypsum solution are used, the rate of drivage is only slightly less than the standardized rate. Another method of grouting using cloth bags which are filled with cement from a pump is described. This method is for use with weak roof rocks. (In Russian)

7920
Monitoring and seismic surveillance of active mine workings
Piguet, J.P.
Tunnels Ouvrages Souter.; (68); 72-80 (Mar 1985)
The author presents examples of monitoring methods for underground workings, classifying them according to the surveillance principle employed. 1) Surveillance based on deformation measurements; monitoring of rock-bolted roadways and room-and-pillar workings. 2) Monitoring by pressure-gauge measurements. 3) Seismic surveillance of solid rock strata. The author has selected methods now in common usage, stressing the systematic application of computer-assisted procedures and the compatibility of techniques, some highly sophisticated, with a hostile environment. (14 refs.) (In French)

7934
Dealing with water from closed collieries within the NCB Western Area
Slatcher, D.J.
Min. Eng. (London); 145 (287); 61-69 (Aug 1985)
The paper gives details of the quantity and cost of pumping at both worked and closed collieries in NCB Western Area. It not only describes the water that has to be pumped at working collieries because of the hydrogeological conditions that affect them, but also the water that has to be pumped at closed colliery pumping stations in order to protect neighbouring working collieries. Planning decisions that have been made in the past to interconnect collieries are considered together with the effect that these have had on the quantities of water that now have to be pumped. It is suggested that short-term solutions to pumping problems can easily lead to long-term major pumping costs.

7969
Computerized drilling and tunnelling
Bristow, N.
Colliery Guardian; 233 (7); 294-296, 298-299 (Jul 1985)
The paper traces the development of computer-controlled drilling systems. The

cate high-noise-level machines and units which necessitate specific noise abatement measures. (In German)

8816
Mine fans with sound muffling at source
Maubon, R.
Ind. Minér., Tech.; 67 (4); 147-154 (Apr 1985)
Describes the modifications carried out to improve the low-noise characteristics of booster fans by replacing the diffuser with a divergent muffler. Presents a diagram of the study process and the results achieved from the aerological and acoustical point of view. Describes how a dust-filler was developed to control the loss of efficiency at the mufflers. Discusses the weight of the retained dust, the pressure and flow losses. Explains how acoustic efficiency is controlled by means of filtration devices. (In French)

8875
The ergonomic approach as applied to the design of a powered support system for thin seams
Ladureau, M.
Ind. Minér., Tech.; 67 (4); 161-164 (Apr 1985)
Ergonomic thinking is characterized by two conditions : ergonomic conviction and a certain degree of ergonomic competence. The design of a shield support for thin seams is discussed, giving the ergonomic analysis : physiological stress on personnel, the aspects involved and how these will affect the personnel in question and ergonomic action : the position, accessibility and actuation of the valve pack, accessibility of the hydraulic components. Also deals with control of dust make, the provision of lighting, etc. (In French)

8883
Hydraulic power underground - fire resistant fluid no longer a limitation. In Hydraulics in mining
Day, J.; Rubery, A.
Conf. on hydraulics in mining, Birmingham, UK, 13 Jun 1985. London, UK, Association of Hydraulic Equipment Manufacturers, pp 28-33 (1985) AHEM Conference Publication P.36 : 1985
The limitations of the fire resistant hydraulic fluids used by the National Coal Board are discussed in relation to the mineral oils they replaced. Bearing life is reduced by using the fire resistant fluids, but this can be dealt with by reducing operating pressure. Early field experiences and environmental and operational considerations are discussed. The advances in gear and piston pumps since the introduction of the fluids are noted and the new challenge of the use of 5/95 fluids in mining described.

8884
Role of hydraulic fluids in modern mining. In Hydraulic in mining
Townsend, F.; Baker, P.
Conf. on hydraulics in mining, Birmingham, UK, 13 Jun 1985. London, UK, Association of Hydraulic Equipment Manufacturers, pp 8-27 (1985) AHEM Conference Publication P.36 : 1985
The introduction in 1964 of fire resistant hydraulic fluids into the British coal mining industry is discussed. 5 kinds of fire-resistant fluids : HFA/E Fluids (dilute emulsions); HFA/S Fluids (dilute synthetic solutions); HFB Fluids (invert emulsions); HFC Fluids (water glycol); HFD Fluids, and tests for fire resistance are described. The application of, and selection of, fire resistant hydraulic fluids in mining are considered, together with design of reservoirs, pipes, filters and valves for use with the fluids. Compatibility of materials is discussed. Multifunctional hydraulic oils are now used on coal face installations and are replacing conventional lubricants elsewhere. The current situation in Britain, Europe, USA, Canada, South Africa and Australia and future development trends, are considered. (10 refs.)

PREPARATION

8017
Flotation reagent technology : the next decade
Townsend, F.
Mine Quarry; 14 (7/8); 32-37 (Jul 1985)
The high proportion of fines in room coal has increased the significance of froth flotation in coal preparation. The mechanism of froth flotation is discussed and an investigation of a number of flotation reagents is reported. It is shown how very small increases in frothing power can increase yields considerably. The effects of additions of emulsifying agents are examined.

8024
Coal fines
Frumerman, R.; Frumerman Associates, Inc., Pittsburgh, PA (USA)
DE - 85008606 DOE/MC/21048 - 1835 128 pp (May 1985)
This report covers a wide field of subject matter relating to coal fines and includes a reasonably comprehensive bibliography. It assesses the possibility of developing a methodology for predicting either the amount of fines or the entire size distribution of coal generated by processing and handling through a series of breakage-inducing steps. The difficulty and costliness for such development is pointed out along with its probable outcome and limitations. 95 refs., 10 figs., 10 tabs.

TRANSPORT & HANDLING

8086
Bunker and vessel level measurements by ultrasonics
Becker, D.
Freiberg, Forschungsh., A; (703); 140-149 (1985)
Explains design and performance of ultrasonic echo sounding equipment for measuring bulk levels at a distance of 0.2 m to more than 20 m in power plant coal bunkers. Technological principles and advantages of echo sound measurements in coal storage bunkers are noted and the basic design of sound emitters and signal transmission equipment is described. The power plant computer system processes a maximum of 64 echograms transmitted from bunker level measuring points. Two ultrasonic measurement systems were tested in GDR power plant bunkers for a bulk level range of 0.7 to 10 m. Results are described as favorable : bulk noise during bunker filling did not interfere with measurements, sound emitters remained free of coal dust, errors in bulk levels ranged between 10 and 20 cm regardless of bulk surface inclinations, and operation of the test equipment was maintenance free. (5 refs.) (In German)

PROCESSING

8329
Criteria for selection of coal seams for in-situ gasification
Martuszewski, E.; Rauk, J.; Synowiec, L.
Koks, Smola, Gaz; 29 (12); 277-279 (Dec 1984)