blowout preventers and detection equipment, and a comprehensive mud grouting system, and continuously records up to ten drilling variables.

875198
High performance PCD rotary drilling tools
Dieckmann, M
Geodrilling N43, April 1987, P27-29

Polycrystalline diamond (PCD) drill bits are widely used in the petroleum and natural gas industries, and the availability of a wider range of PCD inserts has meant that many more applications can use PCD bits. The manufacture of PCD drill bits, their bonuses, and design changes which must be made from the old carbide insert bits are described, with special reference to drilling holes for methane drainage in the German coal mining industry.

875199
Guided longhole drilling
Rees, D H
Gluckauf-forschungsh V48, N2, April 1987, P74-81

The ability to drill near horizontal holes up to 1000m in length within coal seams is of great potential value to the British coal industry. Equipment under development is described. It uses rotary drilling with down-hole motors, angle measurement sensors to assist with steering, and natural gamma logging to differentiate rock and coal lithology. Results from surface and underground trials are presented.

875200
Subsea template drilling in the North Sea - experience gained during the initial stages of the Balmoral development
Thorpe, D; Tayler, P
J Pet Tech V39, N3, March 1987, P331-339

Drilling over a seabed template under hostile conditions in the North Sea is described. A slim-hole drilling and casing program was chosen on cost grounds. Special equipment and techniques used are presented, including directional drilling, surveying using magnetic and measurement while drilling methods, and a special low toxicity oil based drilling mud.

875201
Computer program for air or gas drilling
Chu, M H; Puon, P S
Oil Gas J V85, N12, 23 March 1987, P49-51

A microcomputer program is presented which can be used by field engineers to predict the minimum volumetric requirements for air or gas drilling 'fluid' when air or gas drilling.

875202
Development in hydraulic drifter drilling
Tapaninaho, T
Quarry Manage V14, N3, March 1987, P29-32

Improvements in hydraulic top hammer drilling equipment have made it competitive with rotary and down-the-hole drilling in soft rocks at greater diameters than was previously possible. Better drill steels give better hole straightness, improved flushing capacity and greater energy transmission to the bit. The future of hydraulic drilling to the turn of the century is considered.

875203
Extraordinary drilling challenge in the Rocky Mountain overthrust belt
Swanson, J D; Brandt, I M; Johnston, R D
SPE Drilling Engng V2, N1, March 1987, P75-85

A drilling project to evaluate the Madison formation at depths greater than 5000m is described. Two previous holes from essentially the same site were abandoned after numerous problems, including severe deviation and hole instability. The third hole was successfully completed after 500 days continuous operation. The setting and cementing of large diameter casing strings, and the drilling of a liner through a plastic evaporite zone were amongst the problems overcome.

875204
Geology drilling log - a computer database system for drilling simulation
Onyia, E C
SPE Drilling Engng V2, N1, March 1987, P27-36

A computer based Engineering Simulator for Drilling (ESD) has been developed which allows simulation of drilling in different geological areas using actual drilling and geological data for that environment. The Geology Drilling Log (GDL) is the data base used by the ESD which allows rock properties to be described in sufficient detail. Engineering models and other simulation activities use data from the GDL. The techniques used to build the GDL are discussed.

875205
Penetration-rate performance of roller-cone bits
Warren, T M
SPE Drilling Engng V2, N1, March 1987, P9-18

A model, taking into account both cuttings generation and removal, has been developed to predict penetration rate for roller-cone bits under low borehole pressure conditions. Drilling data from high borehole pressure conditions are analysed to determine why the penetration rate falls as borehole pressure increases. Two contributory factors are found, buildup of debris underneath the drill bit and a local cratering effect. Remedial measures are examined.

875206
Exploration drilling in the Blendevale area, Western Australia: a case history
Campbell, R P
Proc Drillex 87, Stoneleigh, 7-10 April 1987 P1-4. Publ London: IMM, 1987

The exploration drilling program since 1972 in a hot, remote, monsoonal area is described. The area is basically a limestone reef, in some places overlain by calcareous siltstone, and contains zinc-lead deposits and possibly oil. Conditions are amenable to highly productive drilling. The equipment, logistics, costs, and the typical penetration rates achieved are described.

875207
Performance and wear characteristics in diamond core drilling
Cassapi, V B; Ambrose, D; Waller, M D
Proc Drillex 87, Stoneleigh, 7-10 April 1987 P5-20. Publ London: IMM, 1987

Laboratory tests under controlled conditions examined the performance of 2 drill bits, of new design and with slightly different diamond concentrations, in Swedish granite and coarse sandstones. The load on the bit, rotational drilling speed, water flush rate, torque, penetration rate, and wear rate were the drilling parameters monitored through the tests. Attempts were made to correlate drilling performance with rock properties and drill bit design. Rate of penetration was

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