

**NOTES ON IN-SEAM DRILL OPERATOR/SUPERVISOR MEETING  
HELD AT TAHMOOR COLLIERY, 10/11/93**

**ATTENDANCE:** John Hanes (facilitator), Peter Baker and Ian Stone of Tahmoor (hosts), Dave Benson and Paul Harrington of Tower, Russ Phillips and Adrian Barnett of South Bulli, Brian Sheldon of Cordeaux, Jeff Wood of BHP Colls Tech Services, Frank Hungerford of ACIRL, Malcolm Minnis of Longyear, Martin Muliner of Surtron Technologies. (12)

**JOHN HANES:**

1. Ian Gray's project on Optimisation of Longhole Drilling is nearly completed. Two rods, NQ and NW have been physically tested for stresses with one surpassing the other. A physical model which demonstrates buckling of loaded rods and the reduction in bit load was completed. The computer model is being refined.
2. KCC/BHP project on Maintaining Borehole Integrity has commenced with a visit to be made by an American expert to the Illawarra in mid January and the final report expected May 1994.
3. The CMTE has advised its program will involve Geoff Just advancing his Water Jet Drilling project for underground and surface (tight radius) drilling and Peter Hatherly researching the application of geophysical techniques to mainly determining the location of the bit relative to roof and floor. He intends to research radar, seismic and nucleonics (eg an adaption of SIROLOG).
4. Shortlisted projects for the 1994 ACARP round of research funding are as follows:

TITLE	PERIOD	AMOUNT
.1 In-seam drill monitoring and bit location (Stage 1)	12 mths	\$235,000
.2 Equipment and technology research for an underground drilling fluid logging system	6 mths	\$ 45,000
.3 Caliper probe for in-seam boreholes	12 mths	\$ 41,680
.4 Borehole pressurisation system	14 mths	\$121,740
.5 Resistivity and microdensity sonde	12 mths	\$130,105
.6 Bit torque, load and RPM sensors	9 mths	\$ 64,820
.7 Co-ordination of in-seam drilling research	24 mths	\$ 80,000
.8 Supplimentary: Specification preparation for common electrical and mechanical elements for implementation of in-hole data acquisition equipment	3 mths	\$ 11,190

The identities of the applicants remain confidential until final acceptance of the submissions by ACARP.

**FRANK HUNGERFORD:**

1. Proposed AMIRA Demonstration Project for 1994/1995. Funds of around \$250,000 will be sought from industry sponsors for trials of equipment and demonstrations of methods for improving drilling accuracy. The program will be structured as follows:

**A. Down Hole Motor Drilling**

- a) Survey - Collect data (eg costs, time, accuracy etc) on surveys conducted by operators. Survey equipment used in oil and mineral industries. In a trial, run alternative survey tools in holes

surveyed by Eastman tool and compare results. Trial the AMT DDM, the Drill Scout, CHAMP. Pick up bores after mining for confirmation. Compare accuracy, performance, cost, time, downtime etc and report to industry.

b) DHM Hardware - review oilfield etc hardware, investigate DH motors and steering configurations (eg variable bent housings and stabilisers) etc.

## B. ROTARY DRILLING

a) Survey - In shorter term, test CHAMP, Eastman Multishot, ACE (USA), Wellnav if all approved. Single shot can take a day to survey versus 1 hour for multishot.

b) Prorams - establish a databank for improving drilling using BHP monitored rig plus information to be supplied by all pits (Your input to this will be necessary for this part to succeed). Trial various bits etc. Trial BHP rig at other pits with varying geology.

## 2. ACIRL'S LONGYEAR RIG

In November, ACIRL took delivery of a skid mounted Longyear LMC75 rig aiming for 1200m holes. It has a thrust of 130 kN push/pull compared with 90 kN most rigs. It can drill from 10° down to 5° up. Its waterpump is 240 lpm at 10MPa on the powerpack. NQ Acudrill DHM with a 96mm PCD bit plus Eastman single shot for survey each 18m. It has drilled 1035m in 20 shifts, intersecting roof each 60m, and is continuing (it has been reported to have since reached 1200m). Gas flow stabilised after 300m (DB same experience at Tower). DHM has a 1<sup>1</sup>/<sub>4</sub> inch bend. The friction to be overcome to feed rods into hole is 8MPa.

## PETER BAKER

1. Typically drilling in advance of faces to reduce gas content from 10 to 4 cubic metres per tonne. Testing effects of depth restrictions on drainage. Currently have 300m holes across block at 8m spacings draining for 30 days. Aim to achieve face drainage with 3 to 4 90m holes per roadway with 4 days drainage to <5m<sup>3</sup>.

2. A hole recently drilled through a dyke was reamed to 2m beyond the dyke and cased. 100m beyond the dyke, the Dupont tool gave up as the rods were grounding on the casing. Then used PVC casing and overcame the problem.

3. Only 1 in 500 rotary holes surveyed.

4. Downholes typically drilled to Wongawilli seam for post drainage. Drilled from one side on block only with a trial of drilling from both sides planned. Holes are drilled perpendicular to block at generally 18m centres or 10m centres if a floor break is extrapolated from previous walls. Fanning of holes was unsuccessful as was casing. Tahmoor have a good supply of surplus nom. 50mm flanged steel casing if anyone is interested.

## BRIAN SHELDON

1. Scout holes are drilled for structures and gas contents ahead of each panel using Proram rigs.

2. The BHP monitored rig has commenced a trial and has drilled 109m in an hour. It records 9 parameters including depth, penetration, air in, water pressure and flow in, rotation, motor thrust, air pressure on motor.

3. The rig is set at  $+0.5^\circ$  and if the roof/floor is not intersected in 30m, the hole can be drilled to total depth of around 175m (typical). A core is usually taken at 100m.

#### ADRIAN BARNETT

1. At South Bulli, gas contents vary from 3 to 9 cubic metres per tonne at +95% CH<sub>4</sub>.

2. Currently drill 132m holes in advance of 100m pillars with a core at 35 m. One flanking hole on the virgin side is drilled at  $5^\circ$ . Holes are 85mm diameter and take 1 shift to drill with a Proram.

3. Considering 900m holes parallel to gateroads.

#### DAVE BENSON

1. Commenced longholes in 1990. This year budgetted 100,000m with 62,000m in-seam all with DHM and survey. Operate 2 Kempe K200, 3 Dupont survey tools. Slimdrill motors with trials of Acudrill and Drillex.

2. Fishing experience - 3 recoveries due to pumping rotor out of Slimdrill, 1 due to a bent sub snapping, A drillex motor recovery due to a broken sub, numerous situations with bogged rods.

Recently lost 600m rods, a Slimdrill motor and a Dupont tool. The hole was 700m, pulled back for survey and stuck. Attempted many things. Used Quikmud but could not regain rotation. Aligned second rig to improve chances but only managed a half turn. Hooked a 12 tonne air winch to continuous miner and recovered 40m then bogged again. With air winch turned 12 turns in 12 hours. Did not attempt overcore because of extra risks.

3. Prefer to cover developments with flank holes with cores as needed. Drilling is typically 1m/min to 300m then 0.5m/min. Aim for 70m/shift in forward direction. Drill 24 hours per day aiming for 700m hole in 3 days. Some holes are cased. Downholes are usually drilled with Prorams.

4. Prefers to recirculate water through the main dam system of the pit to avoid extra equipment at the drill site. With an ultimate aim of automated drilling, cannot have a man at the site cleaning sieve bends.

5. Dave would like to see one man per DHM rig, wireline recoverability of the survey tool and a method such as casing to keep holes open after drilling.

## MARTIN MULINER

1. Background prior to joining Surtron, 19 years in oil rig directional drilling/survey.

2. Drill Scout - magnetic steering +/- 30° from horizontal (CHAMP will cover all angles). The tool can be fished. The surface box (ie the data unit at the drill) is battery powered with 30 hours continuous capacity. Compound tool face/inclination sensor provides azimuth to 1° accuracy, inclination to 0.1° and tool face rotation to 5°. A production model should be available in early 1994 after final approvals by SIMTARS. Cost is expected to be around \$6000 per month hire.

3. Cable cartridge - The single wire cable is connected with a wet connector and latching device. It is designed as a unit with replaceable cartridges. The cartridge of 350m of wire resides in the first rod. It has been "bench tested" simulating a depth of 1200m with the Drill Scout.

4. CHAMP - Combination High Accuracy Magnetic Probe is a downhole electronic multishot system which can be used for steering or multishot surveying. It is one order of magnitude more accurate than the Drill Scout. Approval for use as a flameproof multishot instrument is being sought and expected by December 93. It stores 1023 data points including azimuth, inclination, vector magnetics, raw data gravity, total magnetic field. It interfaces to IBM compatible computers. Cost uncertain.

## OUTBURST THRESHOLDS

From the discussions, outburst thresholds are being determined from gas contents reported on at least three different bases. It was agreed there is a need for each company to be using the same bases at least. As the drill supervisors and geologists involved in the operator meetings are also involved in reporting outburst thresholds, it was decided that the next meeting should be extended to allow discussion of gas content testing and reporting.

## NEXT MEETING

The attendees agreed to continue meetings. The next meeting is planned for mid February, 1994 at ACIRL Bellambi. A tentative date of Wednesday 16th February should be set aside. Please advise if you have a request for any special presentations or any guests. The morning will involve In-seam Drilling and the afternoon Outburst Gas Content Thresholds. An agenda will be distributed in early February. A meeting will be held in Queensland for operators in February or March.

I wish you and your families, a very happy and healthy Christmas and New Year.

JOHN HANES