ADVANCED MINING TECHNOLOGIES
Drill Guidance System
The Survey Tool with a future

By: Henk Verhoef
Advanced Mining Technologies
1990 – 1995 DDM Acoustic
1995 – 2004 DDM MECCA
2004 - Drill Guidance System
Technical Issues - Certification

- Compliance with Australian and overseas Standards
- Ex d ia m s
Technical Issues – Downhole Design

- Sensor issues
- Material issues
- Electrical power issues
- Space restriction
- Vibration issues
- Two way communication issues
Technical Issues – Communications

- Acoustic (Sound)
- Mud/pressure pulses
- Wire line
- Electromagnetic waves
- MECCA drill rods
Technical Issues - Communications

Modular Electrically Connected Cable Assembly
(MECCA)
Technical Issues - Communications

Modular Electrically Connected Cable Assembly

(MECCA)
Technical Issues – Survey Sensors

- Magnetic and gravity measurements
- Gyroscopes
- Accelerometers
Design Issues – Future

- Geophysical sensors
- Roof and Floor distance detection
- Drill rod counting system
- MWD gas contents measurement
- Drill rig monitoring
- Etc.
Design Issues – Flexibility

- Multiple Language Support
- Program flexibility and upgrades
- Bore hole planning or guidance
- Communication protocol and data transceiver hardware
- Etc.
Numeric display / Borehole graphs
Downhole Battery Management

Battery Status

Battery - S/N 00092702

<table>
<thead>
<tr>
<th>Remaining (Estimate)</th>
<th>Used</th>
</tr>
</thead>
<tbody>
<tr>
<td>Time: 94 Days, 1 Hours</td>
<td>30 Days, 1 Hours</td>
</tr>
<tr>
<td>Total Surveys: 6003</td>
<td>1919</td>
</tr>
<tr>
<td>Capacity: 75.8%</td>
<td>24.2%</td>
</tr>
</tbody>
</table>

Exit
Continuous Toolface Display

[Image of the Continuous Toolface Display window showing a circular graph with degrees and a status bar indicating mode, read interval, and next update time.]
Built in Diagnostics tools
Focussed Gamma Sensor

Gamma Sensor Interface:
- Gamma 1: 340 CPS, 0 GTF
- Gamma 2: 51 CPS, 180 GTF
- Progress:
- Read Interval: 5

Gamma Data:
- 180 degrees
- 6:00
DGS – Gamma Logger

Gamma Log

Sample Interval: 5 Seconds
Start Depth: 975.00 Metres
End Depth: 969.00 Metres
Status: Ready

Start  Stop  Save  Swap  Exit
Surface to in-seam capabilities

DGS
Drill Guidance System
Real Time MWD Steering Technology
Drill Guidance System
The Survey Tool with a future

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