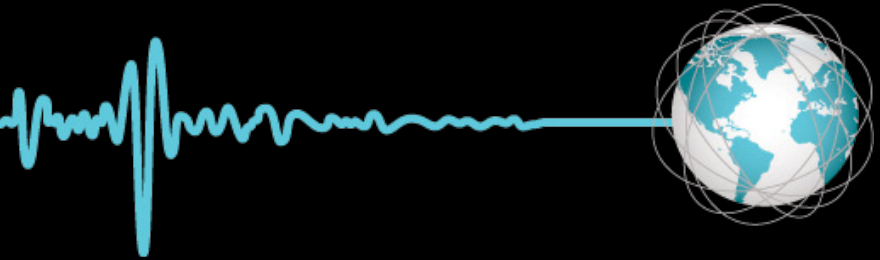


SureWave Technology Ltd



Presentation of Proven Technology:

Advanced Warning of Potential Side Wall Failure

SP2 Model MM2 2013

Philip Shaw

Passive Micro Seismic Imaging

The information to enable —

- Advanced warning of side wall Instability
- The location of potential failure and event timing
- Information to modify the mining plan
- The potential to increase the side wall angle with substantial cost savings



18 week advanced warning to roof collapse in Leicestershire coal mine.

Independent tests verified by
The University of Liverpool UK.

18 week advance warning of roof collapse in Leicestershire coal mine.



This is a report on the monitoring of Asfordby mine Leicestershire UK.

Independent tests verified by the University of Liverpool UK.



The system is normally installed on the surface above the mine utilizing existing bore holes as seen here.

- SP1 uniquely monitored a fully working coal mine
- Gave clear and precise warnings of major roof fall 18 weeks before the event
- No other system can detect the tiny signals masked by the huge mine activity signals.
- SP2 Updates this technology to real time stand alone analysis
- Results independently verified by The University of Liverpool UK
- Abbreviated report results over leaf
- Potential to save lives, protect mine investment and maximize material extraction
- System is normally installed within a day above the mine utilizing existing bore holes



Philip Shaw



Technology proven to detect precursor events at a sensing distance of 5.2KM

Tests performed above a coal mine in South Wales using sensors mounted on bedrock to detect gas outburst precursors.

Bore holes are not normally required!



Notable Demonstrations / Achievements:

Sensors mounted in shallow surface holes.

- Trapped Miners detected at over 1500ft surface distance and 1800ft depth in a fully working mine – Kentucky USA, December 2012.
- Mine Rescue Gleison Mine - South Wales, September 2011.
- Tunnel Detection (footsteps, cart, hammer, crib-block) for the USA Military – YPG Arizona, December 2011. "SureWave are by far the out and out leader in this technology" – General in charge of the test site.

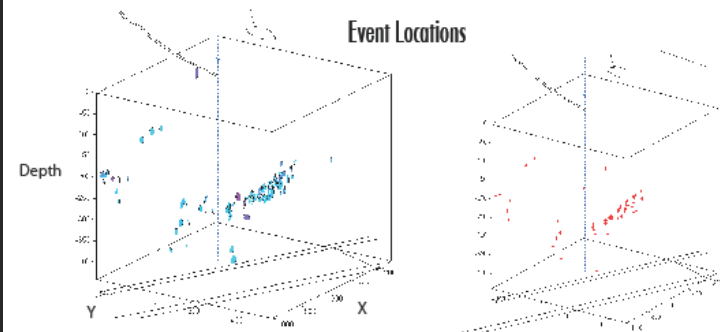


SureWave Micro Seismic Monitor Model SP2

SureWave Technology Ltd



Microseismic Monitoring for Mine & Side Wall Stability - SP2 Model MM2



The discs (above) show location, direct and magnitude of seismic events

Real time display of Mine / Open Pit Strata Stresses.

Revolutionary technology clearly identifies strata stress by recording the microscopic seismic signals generated. This is achieved by eliminating all of the surrounding noise associated with a fully working mine or pit. With a Sources to Sensor range of over 5KM, Bore holes are not normally required to monitor the pre-cursors to mine / slope failure or gas out-burst.



Multi channel seismic inputs

Unique proprietary IP 'See Through Mine Noise'

Extreme dynamic range exceeding 130dB

Stable embedded Windows platform

Touch screen technology in conjunction with powerful user interface software for ease of use

Full IP product for utilising all IP networks

Each sensor detects up to 5KM - No need for Bore Holes

philip@surewavetechnology.com

www.surewavetechnology.com

+44 (0)1270 757900

SureWave Technology Ltd

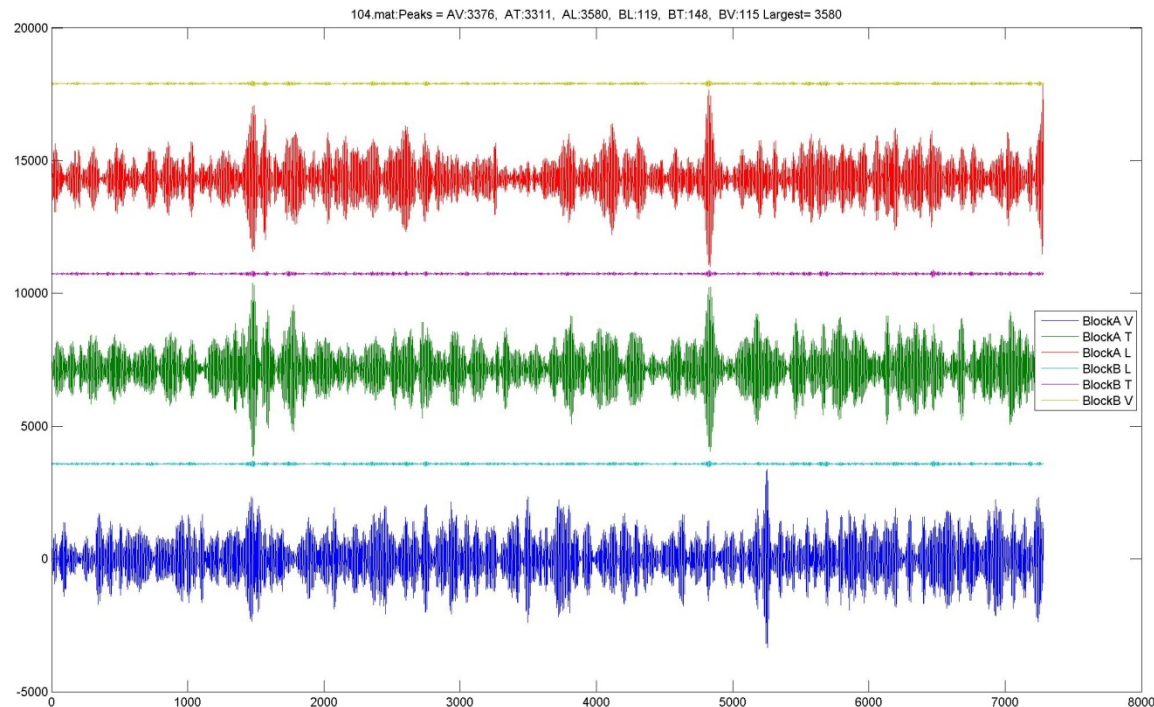


Presentation of Proven Technology

Philip Shaw, Managing Director
E-mail: philip@surewavetechnology.co.uk
Telephone: +44 1270 757900

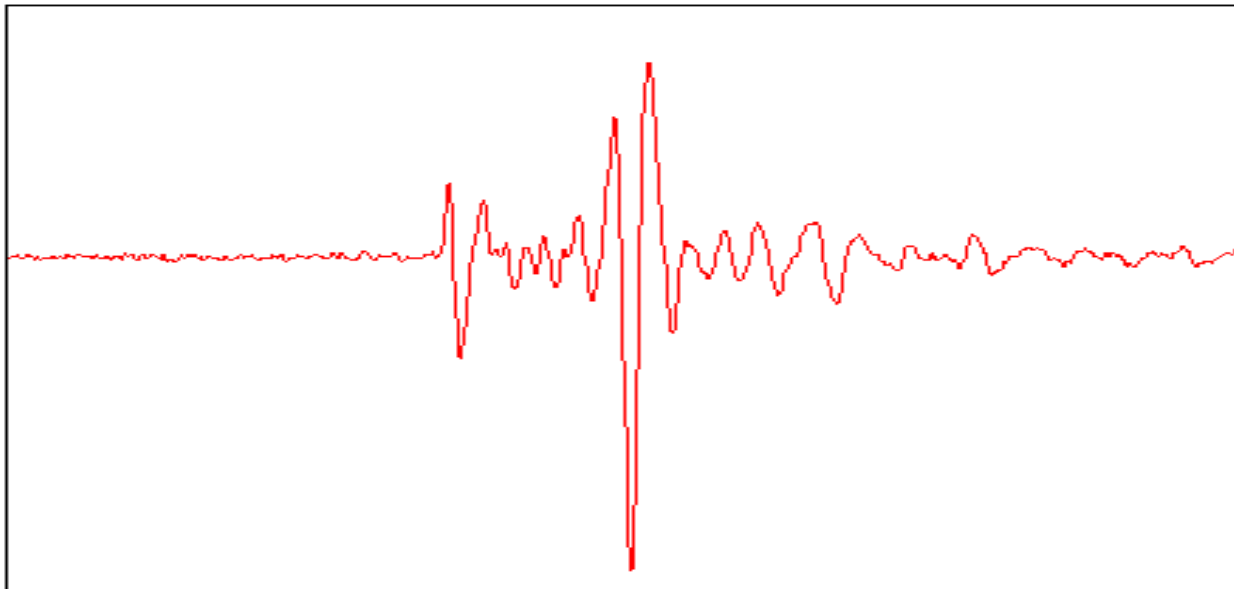
Micro Seismic Data

General Seismic Signals in a working environment

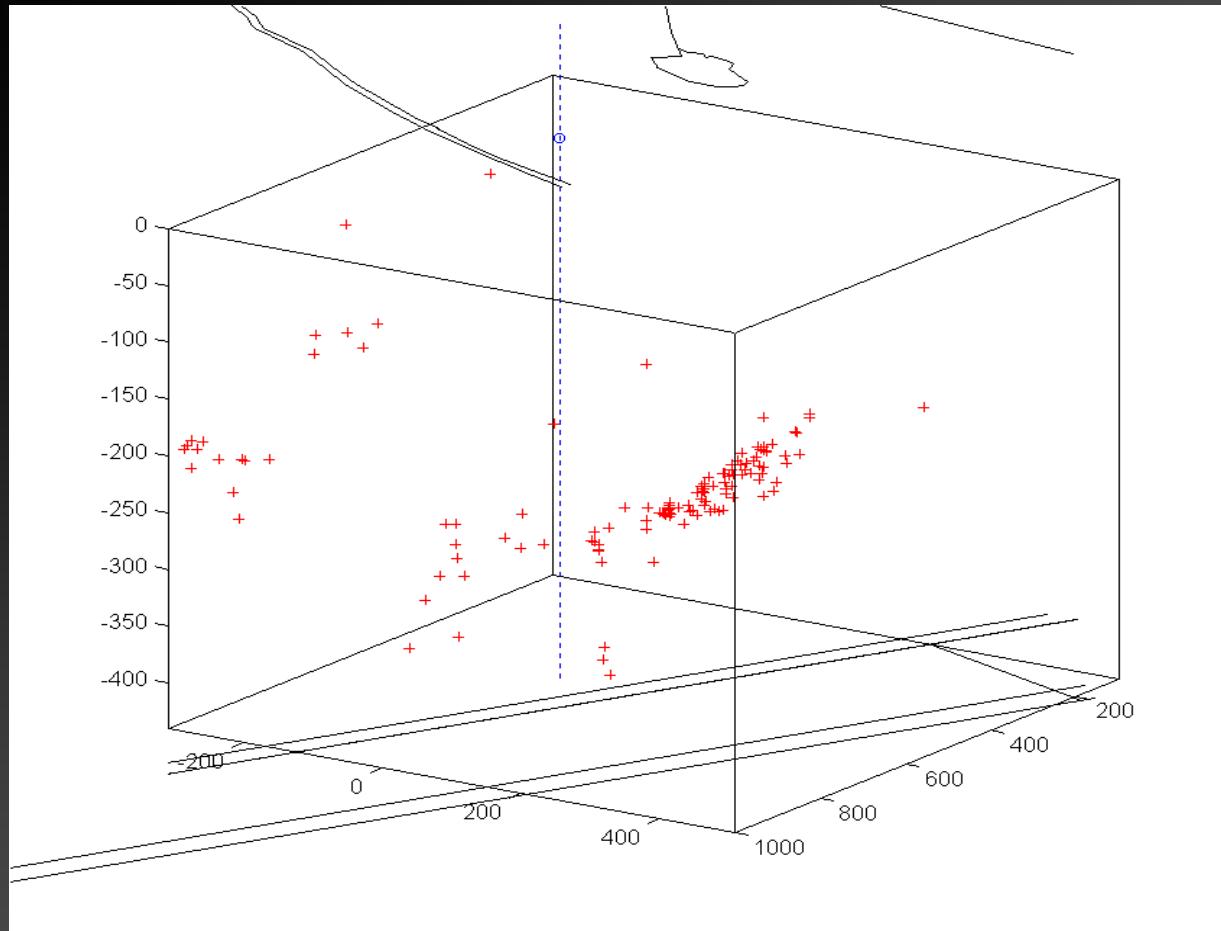


Micro Seismic Data

Clear P-S waves are produced as a precursor to strata failure and can be detected even in a noisy environment. All other signals are eliminated by our unique IP.

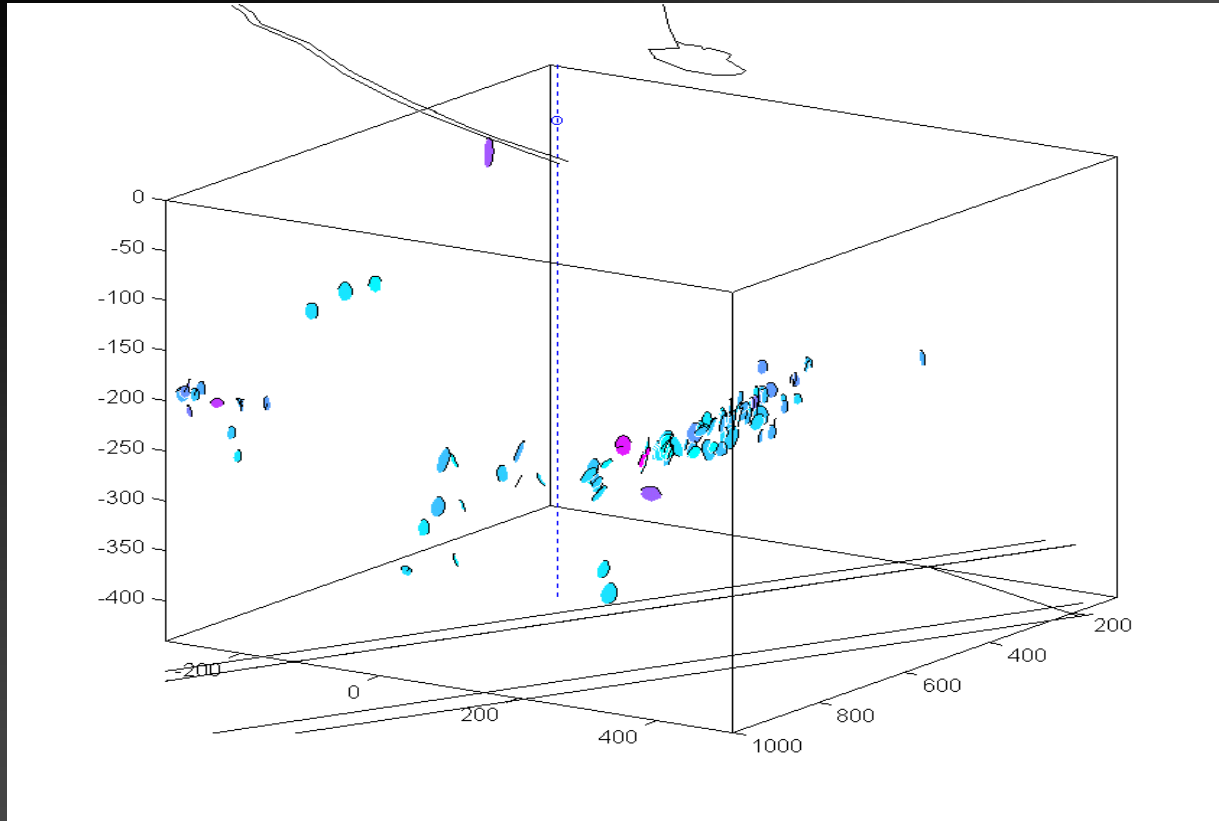


Event Locations



Event Information

Detailed information can quickly be visualized (Magnitude, Direction, Clustering)



Monitoring Open Pits

- Uses proven technology.
- Indication of side wall failure will be given potentially weeks before any measurable movement can be detected by other techniques.
- Suitable for any size or depth of pit or quarry.
- Potential for greater mineral extraction with steeper sidewalls using this unique monitoring system.



KEY BENEFITS

- UNIQUE MICRO SEISMIC SYSTEM GENERATES A NEW LEVEL OF PRE-EMPTIVE REAL TIME INFORMATION.
- STAND ALONE SYSTEM — INSTANT VISUAL DISPLAY OF STRESS BUILD UP/ MICRO SEISMIC ACTIVITY.
- IN A STABLE PIT, THE ANGLE OF THE SIDE WALL CAN BE INCREASED GIVING AN EXAMPLE SAVING OF £0.5 MILLION PER MONTH PER DEGREE.



MICRO SEISMIC IMAGING

SUREWAVE'S UNIQUE TECHNOLOGY WILL ISOLATE SEISMIC ACTIVITY INDICATING POTENTIAL FAILURE OF THE STRUCTURE USING ITS ABILITY TO SEE THROUGH MINE AND ENVIRONMENTAL NOISE.

