Continuous Monitoring of Longwall Undermining

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FS 4D – Landslide and Subsidence Monitoring II
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Who Am I? Who Are We?

- Steven Garlinge
- Geomatic Engineering (2000) Hons I
  UNSW, Sydney

- Lynton Surveys
- Sydney based survey company
- Specialising in:
  - Tunnelling
  - Automation
  - Monitoring
  - TBM, Roadheader and Mining Guidance Systems
What is Longwall Mining?

The Effects of Longwall Mining

- **Subsidence** – up to 700mm at the centre of 1km wide ‘area of influence’

- **Strain** – Changes in length of ground of up to 2mm/m

- **Tilt** – As subsidence is not uniform, changes in tilt (curvature) are measured
The Effects of Longwall Mining

Project Scope

To monitor data suitable for the purposes of:

- Gathering a knowledge base to apply to future longwalls
- Refining monitoring techniques (minimising) and management systems
- Keeping trains running safely and not interrupting mining activities
How Did We Do It?

Supplemented traditional longwall monitoring techniques with hardware suitable for continuously monitoring the railway (stress and geometrical parameters)

Designed systems, software and processes to facilitate continuous capture, calculation and analysis of data
Conclusions

- Highly Successful project, combining multiple technologies:
  - Traditional Survey measurements
  - Alternative measurement technologies
  - Communications – GSM etc
  - Web data access
Conclusions

- Reinforced, to me, the changing role of the Geomatic Engineer

  ...more precisely:

  How the Core Competencies of our profession, (and our organisations) can be leveraged in new ways to support engineering and industry