

Case Study

Close-Range Photogrammetry for Trajectory of Falling Rock Material



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Using precise photogrammetric imaging, the AAM Industrial Metrology team has traced the path of rock material entering BlueScope Steel's No. 5 Blast Furnace.

Cameras were set up at a large door at the top of the furnace and trained at the exit point of the rock material. The remote-controlled cameras were synchronised and all imagery was automatically meta-tagged and transferred to a laptop for immediate assessment.

The imagery was georeferenced without physical targets in a unique system during an office processing stage. Trajectories were traced and embedded into 3D PDF documents for simple analysis and visualisation. Numerical data were fed into engineering models.

Terrestrial laser scanning (TLS) was relied on to provide comprehensive 3D burden surface maps, which will assist in optimising furnace operations.

All measurements were undertaken in a 36 hour shut-down, and this window of opportunity was a one-in-15 year event. There was no room for error.



Above: Team setup at chute change door

AAM designed and deployed a high-tech solution that was non-intrusive to our activities during the campaign. Their results were timely and valuable to our research.

Dr Nick Di Giorgio
BlueScope Senior Development Engineer

Project Features

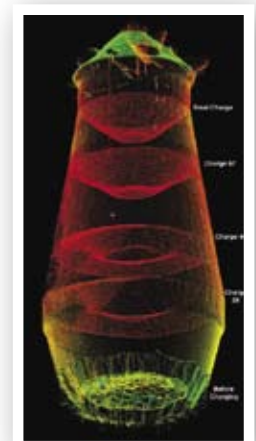
- Digital convergent photogrammetry for dynamic measurement
- Terrestrial laser scanning for surface measurements
- ±10mm accuracy
- Deliveries flowing one day after campaign

Project Deliverables

- 3D PDFs containing 3D vector information, photographs and cross-sections of trajectories
- Laser scan clouds for visualisation software
- Contour maps with plant overlay
- Numerical information in spreadsheets

Benefits

- Accurate 3D measurement technique
- Allows measurement in situations involving moving objects or unstable setups
- Permanent visual record of the job



Right: TLS composition of scan data showing 4 levels of fill