

**SPOTLIGHT: SURVEYING**

# SCANTASTIC MODELS

Mining Surveys (UK) is using laser scanning to create quick to produce 3D images of buildings like old factories which are being redesigned. **NCE** reports.

**Wide angle:** Scans take in all of the details in a factory and can produce panoramic images. (Left) Detailed scan of machinery and surrounding elements



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**T**he cost of creating 3D models for small projects to change the use of buildings can be hard to justify.

Often, new plant and machinery is introduced, sometimes alongside existing equipment and a 3D model of the building is desirable. But collecting measurements using conventional methods is difficult and it often takes weeks to produce final plans, only to find that more data is required, necessitating a costly revisit.

Terrestrial laser scanning can now produce very accurate, detailed data sets, and has been extensively used in the petrochemical industry for many years. Derbyshire based Mining Surveys (UK) specialises in integrating survey data from terrestrial laser scanners, survey grade GPS and robotic total stations to produce plans, sections, elevations and 3D models.

Its Riegl VZ-1000 laser scanner measures up to 122,000 points per second at ranges up to

1.4km, far in excess of anything that can be achieved using conventional surveying methods. It measures virtually everything in view, is non-contact, and work can be carried out rapidly while facilities remain in operation.

Once a 3D cloud point model is created, data is filtered to remove obsolete plant and machinery, allowing for the insertion of the new equipment. There is now no need to produce a conventional 3D solid building model. Most manufacturers also have 3D models of their equipment, or at least data from which 3D models can be created. These can be placed within the cloud point data and analysed for clash detection.

The Copernico consortium of European universities and businesses includes Sheffield University and technology company Teks 3D. It has recently employed the method for a project to develop and simulate virtual factories.

"This can be a whole build-

**"To add a new machine we must understand the impact on the whole factor"**

Rab Scott,  
University of Sheffield

ing or a cell within a building or a process within a cell," says University of Sheffield Advanced Manufacturing Research and Development head of virtual reality Rab Scott. "To add a new machine we must understand the impact on the whole factory to be able to plan whatever we need,"

"The 3D scan data supplied by Mining Surveys is combined with 2D simulation to visualise the impact on the layout."

The model includes all of the

features in a factory area.

"This 3D model includes all overhead and other obstructions such as pipes, pillars and walls," says Teks UK R&D general manager Roland Krain.

"Teks 3D machinery models were placed in the point cloud model of the factory using advanced visualisation tools from Virtualis," he says.

Mining Surveys technology was applied recently to a project for tools manufacturer Footprint Sheffield.

"We needed a visual representation of our factory in digital format so that advanced modelling software could be used to determine 'best fit' of machinery for improving work flow," says Footprint Sheffield director Christopher Jewett.

"Our aim is to make laser scanning technology available to a much wider range of projects, not just the high profile, large budget schemes," says Mining Surveys managing director John Halifax.