

# Case study :

## Integrated Spatial Management Solutions

3D Laser Scanning / Dimensional Control Management

### Case Study

**Business and technology trends in capturing and managing existing conditions data for engineering construction operations**

BP Thunderhorse



### : SparView™ Vol. 3, No. 19, June 8, 2005



By Bruce Jenkins, Senior Analyst

Hi-Cad Limited, Dingwall, Scotland, is one of the world's most experienced providers of dimensional control services for offshore and onshore process facilities. Noted for more than 25 years of working in some of the most inhospitable environments on earth, the company is also known for holding its cards close. But director Ian Mackie and operations director Dave Penman opened up for us. Here's a look at what's driving investment in Hi-CAD's services, how the company built its expertise, and where laser scanning fits into its arsenal of dimensional control technologies.

How many jobs has Hi-CAD executed? "Hundreds," according to Mackie. What are some of the benefits for clients? "In work we've done for the likes of KBR in the Gulf of Mexico," Penman reports, "we've done projects where we've installed 900 spools without any field welding" - quite an achievement.

"Now we're getting involved in positioning Christmas trees offshore," Mackie says. "Typically it would be a two-week process to position the tree, then make the last spool up, then tie it together and get into production. We can reduce that two-week process to two days, because we can predict where the tree position is going to be, and we can show the final spool with the Christmas tree." Besides shortening time to production, this also yields direct cost savings. "In one project we did for BP in the Gulf of Mexico, they were able to get the utilities up and running a week early," Penman says. "That meant they were able to release the accommodation platform a week early - big-buck savings for the oil company. That was all due to the spools fitting first time without rework."

With all these benefits, what's holding back investment in laser scanning and other dimensional control techniques? "The biggest problem," Mackie believes, "is getting the people who are not using it to recognize where they're spending their money at the moment. When you give them a price for laser scanning, their first reaction is, 'Oh, it's just too expensive.'"

Hi-CAD has seen this before, first with its D.I.M.E.S. (Data Integrated Management Engineering System) dimensional control technology, then with photogrammetry. "You say to them, 'Well, what does it cost you to do it manually, just using tape and clipboards?' And the answer is: they don't know. Once you go and ask the company to use people like us, we become an identified cost to the project that hadn't been there before. To me, that's the biggest thing to overcome - to get them to recognize there's already a cost, and by improving dimensional control they can reduce the cost."

**hi-cad**

Bridgend Road, Dingwall, Ross-Shire - IV15 9SL - Scotland, UK

Tel : +44 (0) 1349 864 455 Fax : +44 (0) 1340 861 45

Web : [www.hi-cad.com](http://www.hi-cad.com) E-mail : [info@hi-cad.com](mailto:info@hi-cad.com)

# Case study :

## Integrated Spatial Management Solutions

3D Laser Scanning / Dimensional Control Management

### Case Study

### : Total stations to photogrammetry to laser scanning

*Continued from SparView Vol. 3, No. 16, May 10, 2005*

Hi-CAD Limited, Dingwall, Scotland, is one of the world's most experienced providers of dimensional control services for offshore and onshore process facilities. Last month we looked at what's driving investment in Hi-CAD's services and how the company got its start. This week we explore how Hi-CAD has expanded its arsenal of dimensional control competencies, and where laser scanning fits in.

What led Hi-CAD to expand from offshore into other markets? "A milestone was in 1997 when we were taken to America by Amoco," says operations director Dave Penman. "We had done work for Amoco in the UK. They saw the benefits of our process, so they took us to their Whiting refinery in Indiana. Then we migrated to Texas, where we have an office today."

This was when Hi-CAD first moved beyond total stations to other digital tools for existing-conditions capture. D.I.M.E.S. used with total stations is "very high-accuracy, but low-volume," Penman explains. "To capture a lot of information, it was too slow. That's one reason we then went to close-range photogrammetry in conjunction with D.I.M.E.S., to have a tool to capture high volume as well as high accuracy. We got into photogrammetry in mid-2000, using the Vexcel solution."

Is Hi-CAD still using photogrammetry now that it's brought in laser scanning? "Yes, we're still using it," says Penman. "Sometimes photogrammetry is still the best option, for example if you're working in an environment that's very unstable. Because the camera takes a picture in hundredths of a second, you don't have to have the stability" that laser scanning requires. "We've done some jobs where the platform was a work boat. The photograph takes hundredths of a second, so it's not affected by the movement of swells."

Photogrammetry is also well suited to working in congested or constricted environments. "With laser scanning," Mackie notes, "the difficult part is trying to get the laser scanner up to a position it can look down from - trying to get a good viewpoint." Penman explains that using photogrammetry, "We've done some work offshore where we're actually working in the substructure, where there's very little walkway. It's all stairways, small access-ways - very poor conditions for getting a laser scanner set up. We've done complete plants with close-range photogrammetry."

When is laser scanning the right solution? "What killed photogrammetry years ago was the cost and delay of developing the data," Penman says. "Laser scanning gives you a 3D deliverable almost straightaway. So for an offshore job where we can get stability, we're going to use laser scanning. But if there are highly vibrating conditions or very tight access, that's a job for photogrammetry."

Conoco Magnolia TLP



hi-cad

Bridgend Road, Dingwall, Ross-Shire - IV15 9SL - Scotland, UK

Tel : +44 (0) 1349 864 455 Fax : +44 (0) 1340 861 45

Web : [www.hi-cad.com](http://www.hi-cad.com) E-mail : [info@hi-cad.com](mailto:info@hi-cad.com)