

Point cloud modelling is only one of our measurement capabilities in this example used to model a large Clyde crane on a subsea support vessel. The model created was carefully structured to enable it to be exploited in Finite Element Analysis (FEA) for subsequent stress simulations. Our other solutions allow us to measure to high accuracies down to 25 microns or long distance single measurement to 600m.

# SPATIAL SOLUTIONS

## Making space for ground-breaking solutions

If you like the sound of first-time fits, reduced costs and risk mitigation then read on to find out why Spatial Solutions' industry leading innovations could offer you that and more. Guy Rennie, manager of Spatial Solutions at PSN gives us the lowdown.

"Spatial Solutions is PSN's internal capability in the field of 3D/4D data acquisition, analysis and exploitation. We provide customers with unrivalled insight of their projects spatial and related analytical characteristics", says Guy. "The information we can capture and exploit has many applications throughout a project life-cycle and supports interpretation, analysis, communication, design, planning, fabrication, engineering, construction, and decommissioning. Accurate dimensional information is increasingly critical and can quite simply make or break a project."

Established in late 2009 when Guy Rennie brought his innovative proposition to the table, Spatial Solutions is the most recent service to be added to the PSN mix. Whilst Spatial Solutions services will continue to grow and diversify, the teams main focus is to capture and exploit survey data for customers assets, typically laser scanning specific areas of an asset where the customer has repair or modification work to carry out.

For PSN or customer design and structural disciplines to do their job as effectively and accurately as possible they require up-to-date spatial information of the reality on the asset – not design models or drawings which can often vary from as-built drawings or not account for modifications that impact their specific scope, as Guy explains.

"The other potential problem lies in the fact that industry staple tools such as PDMS can only work to constraints of the orthogonal projection which means you cannot create true as-built models within PDMS because the reality of as-built data is it does not precisely align to the ideal world of design models.

"The objective for Spatial Solutions is negating or controlling these risks to ensure there are no 'failures to fit', clashes or other spatially related errors impacting any aspect of our clients work. We're doing this by challenging the traditional way of doing things and we've already made impact particularly in regard to reducing offshore man-hours with our new methodology.



**Guy Rennie, PSN Spatial Solutions Manager**

An international expert in his field, Guy has 25 years experience at the cutting edge of spatial and related analytical engineering in a diverse range of industries. His ability to identify improvements within the oil and gas industry has its foundations in military reconnaissance intelligence where he learnt the science of photogrammetry and remote sensing before going on to 20 years of spatial engineering around the world on projects in Formula One, defence, aerospace, automotive, geospatial and marine.

Guy has a passion and clear focus to drive this area of expertise to the heart of the PSN business and position Spatial Solutions as a leader in the industry.

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"Our competitors use two surveyors offshore even for simple small jobs, we've done hundreds of repair orders in this first year for PSN's BP project team with only one man offshore per trip, yet we increased productivity by over 100% in some cases. That's a 50% reduction in offshore man-hours with increased productivity, one of the reasons BP gave us positive feedback on only our second offshore trip when over 25 repair orders were captured against a targeted 10."

### The colour of innovation

Since the first laser surveys were carried out designers and engineers have been delivered point clouds in black and white. This has been the accepted standard globally for many years in the industry, until this summer when Spatial Solutions raised the standard significantly, as Guy explains.

"This was a no-brainer for me, a designer is going to have far better interpretation of a complex offshore environment if they're looking at colour image rather than black and white so that's what I introduced. We now reference colour imagery from the site and in post process we render the corresponding colour values from the image to the laser scanning model which results in what appears to be a colour photograph but is in fact a multi-million point 3D laser point cloud, making it far easier to reference and identify distinct elements. One of my team has experience exploiting laser point clouds for Hollywood movies so we have taken the next step to produce High Dynamic Range (HDR) imagery that

has a truly stunning level of quality and clarity."

### Satisfied customers: PSN's BP Focus team

This year the team carried out offshore surveys on a number of BP assets in the North Sea, particularly on BP Magnus and Schiehallion for the TAR projects.

"The work started before we even had the team fully operational which put us under significant pressure but thanks to the calibre of my team we pulled it off. Spatial Solutions also facilitated the BP designers to work directly with laser point clouds within their familiar PDMS environment, negating a previously significant bottleneck. We have had great support and cooperation from the BP Focus team who placed a lot of faith in us getting the job done.

"This integration of Spatial Solutions within PSN has proven itself with the close working relationship established with the designers – our primary end users. As we introduce more innovations and work with the design teams throughout PSN, our objective is to create the most efficient and cost effective 'survey-to-design' interface in the industry.

"We put Spatial Solutions under pressure from their inception and they delivered", says Alan Watt. "We have demonstrable results showing significant cost savings against our external survey providers, increased productivity and with their new methodology a significant reduction in offshore man-hours. The introduction of full colour point cloud has

also been a revelation.

"With a major workload, supporting BP's TAR's carried out over the first twelve months of the contract, we have seen a 98.85% first time fit rate and Spatial Solutions were a significant factor in supporting us to achieve that. I've been pleased to report their impact to BP and first to recommend their service to others in the business."

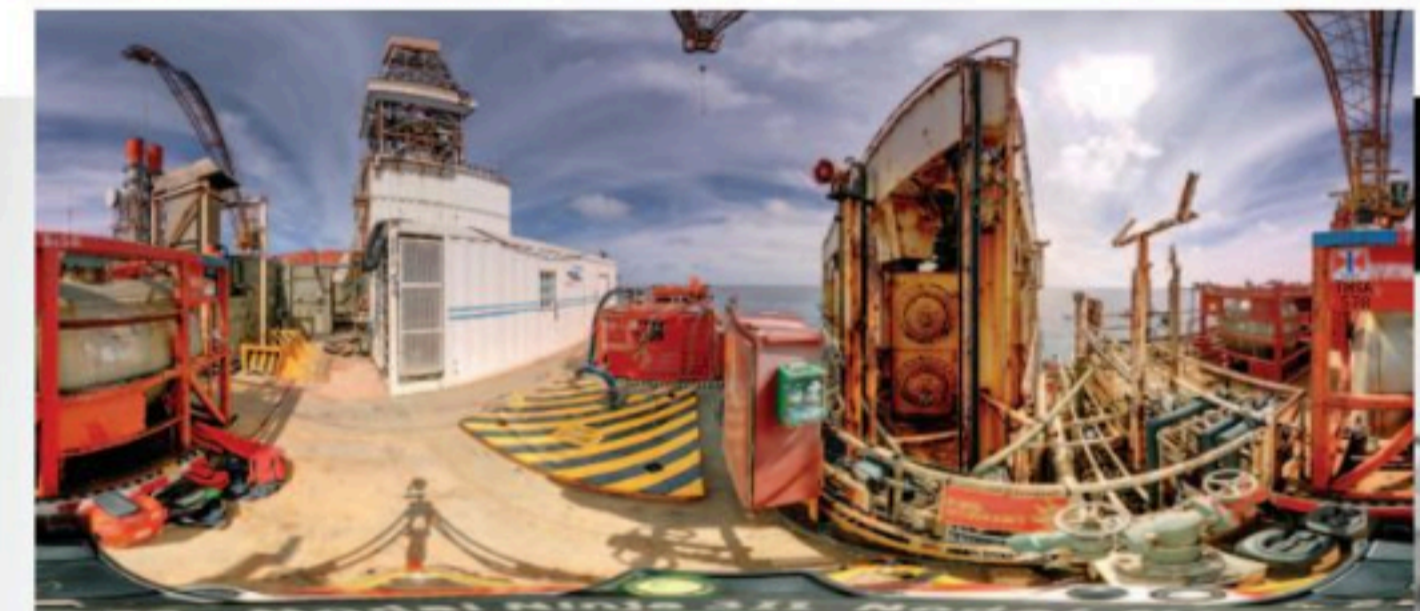
### The future

Spatial Solutions isn't just another survey operation as Guy explains, current and future capabilities and objectives will define a new level of service.

"As the name suggests we're about providing a solution to almost any aspect of spatial issue influencing a client. In oil and gas most things with the exception of geophysical survey and analysis.

"So whilst this first year has been about getting the primary services in place, for 2011 on we will be turning attention to major transformations of how offshore surveys and fabrication processes are executed as well as looking at subsea solutions where we have some very strong potential to significantly shake things up."

The message to the readers out there is if you have any measurement and analysis issues ahead give us a shout - Spatial Solutions can probably help!



360 degree dome imagery captured from the scanner is used to create TruView as well as provide the colour values used for rendering the point cloud. TruView is a powerful plug-in to Internet Explorer that allows our customers to view and navigate colour rich point clouds and extract basic measurements or annotate and mark-up for online and remote collaboration sessions.