



Specialist two day conference providing the community with valuable insight into the technology, operations and business issues in the global field of offshore surveying.

## WEDNESDAY 10 APRIL 2013

0830	Registration and refreshments	
0900		<b>Introduction and welcome from the Conference Chairman</b> Ed Danson, <i>Conference Chairman, International Sales Manager, C-Nav, UK</i>
0915	Rob Luijnenburg <i>Corporate Strategy &amp; Communication Director</i> <b>Fugro NV</b> Netherlands	<b>KEYNOTE ADDRESS:</b> <b>Is Hydrography keeping up in the Facebook world of today?</b> Marine companies face interesting challenges in maintaining the attractiveness of graduates who like to learn fast and move around in companies to experience different sides of doing business without becoming an expert in anything. Is our business model ready to reorganise and work differently and can our technology help this group facilitate their needs? Furthermore, we have to ask ourselves how survey data is gathered in the future. Can airborne or satellite imagery replace current means of data acquisition? What skills should our future Hydrographer have? This paper will anticipate what the future brings.
<b>1</b>	<b>Hydrographic &amp; Seabed Survey</b>	
	Session Chair: David Parker, Civil Hydrography Manager, UKHO, UK	
0950	Gordon Johnston <i>Director</i> <b>Venture Geomatics</b> UK	<b>The role of AUV's in pipeline inspection and other hydrographic survey projects</b> Significant advancements in a variety of technologies have led to the successful introduction of AUV's for a variety of surveying roles. However their impact on the 'high end' pipeline inspection is not yet complete. Can AUV's become the standard acquisition platform for pipeline and other inspection surveys or are the challenges and obstacles that prevent the uptake and adoption of AUV technology simply too great? This paper will explore processing workflows and highlight the challenges and benefits through a series of real world examples, with a view to addressing key questions and promoting discussion on the future use of AUVs.
1015	Chris Gibson <i>Director – Sales &amp; Marketing</i> <b>VideoRay LLC</b> USA	<b>Autonomous mini ROV inspection and survey – the benefits of smaller, lighter and ultra portable ROVs</b> The mini ROV is smaller, lighter, ultra-portable and consumes very little power, and can be deployed from many different areas. They can be safely used on comparatively delicate machinery without fear of damage. Their thrust to weight ratio means that mini ROVs can handle more current than most work class ROVs in shallow waters. By providing them with autonomous control functions the systems are able to carry out precise waypoint based subsea navigation. Ensuring that the video data is geo-referenced and the Latitude and Longitude coordinates of each video frame are known means that observations and features can be readily revisited in the future. The autonomous ROVs are an ideal low logistic, rapid deployment subsea survey tool.
1040	James Williams <i>Managing Director</i> <b>Swathe Services,</b> UK	<b>The Z-Boat – An innovative platform for mapping difficult areas to access</b> The Z-Boat is a remotely controlled survey boat designed to carry hydrographic survey systems within its payload. Typical configurations consist of a single-echosounder and GNSS positioning system however the vessel can also be configured for multi-role application with the use of an ADCP. A variety of surveys will be presented demonstrating the capability of the system to map inaccessible areas; shallow water environments and in well built up areas.
1105	Coffee break	
<b>2</b>	<b>Hydrographic &amp; Seabed Survey</b>	
	Session Chair: Ed Danson, International Sales Manager, C-Nav, UK	
1145	Andy Smith <i>Business Development Manager</i> <b>NCS Survey</b> UK	<b>Low logistics AUVs – An advanced survey tool</b> If a vessel can be more productive and/or efficient in the field by carrying the relevant tools then there are many benefits for all. This presentation will cover the capabilities of the systems NCS Survey has invested in over the past seven years and some applications and advantages to the customer, as well as some data from projects performed to date, including rig site surveys, some of which in very restrictive locations, route surveys, as well as general offshore subsea surveys.
1210	John Vint <i>Survey Manager</i> <b>Fugro Survey AS</b> Norway	<b>Dynamic calibration of navigation sensors using GNSS technology</b> Over the years there has been a requirement to calibrate navigation (heading and motion) sensors on vessels working in the offshore oil industry and these calibrations are normally required by the oil companies prior to commencement of a project. Historically these calibrations were undertaken using traditional land survey techniques and very labour intensive, but today with a wealth of GNSS satellites, receivers and software the calibration process can be streamlined. This paper covers the techniques and accuracies related to applying GNSS technology to a traditional project task and describes in detail the methodology used and the accuracy of the results obtained.

## 2 Hydrographic & Seabed Survey Continued...

Session Chair: Ed Danson, International Sales Manager, C-Nav, UK

1235	<p>Pat Fournier Operations Manager Neptune Geomatics Australia</p>	<p><b>Deep tow pipeline route survey using interferometric multibeam, synthetic aperture sonar and chirp</b></p> <p>In 2012, Neptune Geomatics was contracted by Hess Exploration Australia to provide a geophysical survey solution for the Equus Deepwater Gas Development Project. The objective of the survey was to provide high resolution seabed imagery, bathymetry and sub-bottom data for a front-end engineering and design study. Neptune proposed a cutting edge solution, utilising a deep towed system configured with synthetic aperture sidescan sonar (SAS). This enabled safe and rapid acquisition of high integrity data from which reliable interpretations could be made. The successful completion of the survey was a global first for the Australasian region and saved the client considerable time and resources by preventing the mobilisation of AUVs and acquiring larger areas of coverage.</p>
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1300 Lunch break and time to join colleagues at Ocean Business

## 3 Data Processing & Visualisation

Session Chair: William Heaps, Assistant Marine Advisor & Hydrographic Manager, ABP, UK

1430	<p>Brian Critchley Senior Project Geophysicist RES Offshore UK</p>	<p><b>Data visualisation and ground model development – the benefits of 2D and 3D visualisation</b></p> <p>This presentation is from a client's perspective. More recently, clients have been using GIS to visualise and manipulate a selection of the data delivered. RES Offshore commence the ground model build at the 'desktop study' phase, to identify data gaps and inform survey requirements. This presentation builds a ground model and highlights the benefits of an interactive ground model with 2D and 3D visualisation capability, in a single environment, with the ability to view cross-sections and time slices and generate 3D pdfs and fly-throughs.</p>
1455	<p>Thomas Gardiner Senior Product Manager Thomson Ecology UK</p>	<p><b>Using marine ecology software for faster and more accurate reporting</b></p> <p>It is vital that data is collected and recorded accurately and stored safely. Advanced marine ecology software brings efficiencies throughout the whole survey cycle. One system can handle survey design and planning, end-to-end barcoding, data and image capture, and output options for reporting. The stored metadata enables a wide range of additional data to be linked to the report output. It is important to take the long term perspective when commissioning surveys. Many projects continue for several years and the original data that fed into a report may be required later for long-term monitoring, comparison with later surveys or for resolution of discrepancies. Marine data management software offers a way of storing these data securely and allowing collation of data for examination in a number of ways.</p>
1520	<p>Duncan Mallace Business Development QPS UK</p>	<p><b>Streamlining and standardising survey data deliverables</b></p> <p>QPS handle, visualise and validate vast data sets and have partnered with ESRI to enable all users and clients of survey data to be able to not only create the databases quickly but also to be able to pull the data from the databases to perform analysis and QC of the data. This paper pulls together all the recent technological advances and will present the streamlined data processing pipeline from online survey all the way through to the SSDM. It will also show how organisations can store the data in a spatial database, rather than a flat file structure and how that data can be brought back into a 3D environment for further analysis and QC.</p>

1545 Coffee break

## 4 Industry & Professional Issues

Session Chair: Ed Danson, International Sales Manager, C-Nav, UK

1630	<p>Nick Hough Technical Adviser International Marine Contractors Association</p>	<p><b>An introduction to guidelines for the management of peripheral survey sensors</b></p> <p>Modern offshore survey specifications may make requirements for maintenance, calibration and verification of survey and positioning related sensors, such as attitude, heading, speed of sound in water and other sensors, central to the success of the project. This presentation will document IMCA's development of guidance on managing survey sensors, considering the main survey and navigation related sensors and the calibration and/or verification issues for each of them. It will also show a path through the potential confusion and misunderstanding, leading to a more consistent and standardised approach to maintenance and better management of survey applications.</p>
1655	<p>John Kelly Technical Manager Hydro Projects UK</p>	<p><b>Geodetic training – Education or confusion?</b></p> <p>The rapid development of GIS and their use in all aspects of data acquisition, management and presentation has greatly increased the number of different types of user who need to understand, use and make decisions based on spatial datasets. The problem facing data managers and GIS developers is the education or training of this increasing number of users. This paper discusses how the education or training of users should focus on the consequences of geodetic issues rather than trying to teach a user geodesy, which has, on occasions, led to more problems with very poor decisions being made based on partial understanding. It reviews the outcome of some examples of the incorrect use of geodesy and discusses how, as a community, we need to ensure that geodetic issues are still considered while not stifling creativity thus, enabling users to maximise the use of their rapidly increasing databases.</p>

1720 Ocean Business exhibition until 1730



## THURSDAY 11 APRIL 2013

0900		<b>Resume of day one and introduction to day two</b> Ed Danson, <i>Conference Chairman, International Sales Manager, C-Nav, UK</i>
0905	Simon Partridge <i>Engineering Director</i> <b>Sonardyne International Ltd</b> UK	<b>Cutting the tether but keeping control</b> Tether-less real-time vehicle control and manipulator intervention operations enabled by a subsea control system that exploits variable degrees of supervisory control over communications and navigation modalities with widely variable latencies, intermittency, bandwidth, and range. An overview of recent deep water trials demonstrating hybrid AUV - ROV operations utilizing BlueCOMM optical wireless video transmission, GyroUSBL acoustic positioning and low latency acoustic telemetry for control.

## 5 Subsea Positioning

Session Chair: Ed Danson, International Sales Manager, C-Nav, UK

0920	Hubert Thomas <i>Technical Manager</i> <b>MANOPI</b> France	<b>Fast black boxes search and accurate positioning from shallow water to full water depth</b> Numerous previous accidents have shown the limitations of existing equipments to search over a wide area for deeply sunk aircraft. More than 700 days have been necessary to recover AF-447 recorders, with search and recovery costs so high that they had to be shared between states organizations, airline and aircraft manufacturers. Early in 2011 an R&D program was funded by a private company, MANOPI, at its own risk, with the objective to develop innovative technologies. These will allow search and accurate longitude and latitude positioning of aircraft recorders over a very wide search area and water depth down to 6000m. Furthermore, associated equipment will be light for easy transportation on commercial airlines and deployable anywhere in the world by a team of three experts mobilizing locally a ship of opportunity. A prototype was built and commissioned in December 2011. First sea trials have shown impressive results that will be presented at the seminar.
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0945	Andrew Mckeown <i>Senior Project Surveyor</i> <b>Subsea 7, UK</b>  Nick Street <i>Project Manager</i> <b>Sonardyne International</b> UK	<b>Bundle monitoring – the history of bundle projects and tows and the requirements of a bundle monitoring system</b> For over 30 years Subsea 7, and its predecessor companies, have successfully been designing, fabricating and installing unique pipeline bundle solutions that neatly incorporate all structures, valve work, pipelines and control systems necessary to operate a field in one single product. In-order to allow a successful tow process the bundle profile needs to be continuously and reliably monitored along its entire length while submerged. The data from this monitoring system is used to ensure the bundle is not unduly stressed by the towing operations and to ensure that it transits above the seabed and any subsea structures with sufficient clearance to reduce the possibility of impact. In 2009 Subsea 7 reviewed the advances in through-water communication and acoustic signalling technology which might provide a robust method of passing data along the bundle and up to the survey vessel. This presentation aims to provide a brief history of bundle projects and tows, the requirements of a bundle monitoring system, the implementation using Sonardyne 6G system hardware and the performance of the Wideband 2 acoustic telemetry.
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1010	Alban Bouchard <i>Customer Support Manager</i> <b>iXBlue</b> France	<b>New iXBlue concept for high precision metrology</b> The use of Inertial Navigation Systems for underwater positioning has seen significant developments over the past few years, and products such as PHINS and ROVINS have become standard in the offshore industry. In order to contain the drift that is inherent in this technology, the use of external sensors is required, and the combination of inertial and acoustic technologies with tight coupling enables the acquired data to reach outstanding levels of accuracy and robustness. ComMet system developed by iXBlue and combining PHINS (Inertial Navigation System) with RAMSES (Synthetic Acoustic BaseLine Positioning System) is a subsea metrology method providing massive vessel time reduction, ultimate performance and the redundancy and peace of mind offered by the merge of these two different yet complementary technologies. The presentation showcases these concepts being put into practice and several examples of applications with the acquired ground data in real situations.
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## 1035 Coffee break

## 6 Survey Operations

Session Chair: Ed Danson, International Sales Manager, C-Nav, UK

1125	Keith Vickery <i>President</i> <b>Zupt LLC</b> USA	<b>The convergence of (subsea) positioning and imagery</b> Much concern has been stated by the integrity engineering community about the completeness and resolution of survey deliverables used for such tasks as regular integrity inspection surveys. DOF Subsea and Zupt LLC are currently developing a capability that will deliver spatially correct (ortho-rectified), geo-referenced (to the quality of the infield positioning systems) 2D images and 3D models of subsea infrastructure based on precisely positioned, frame grabbed imagery from standard ROV cameras. We believe that this type of innovation will provide the end user with the optimal visual deliverable while satisfying the rigid spatial integrity demands of the integrity and surveying community. This paper will describe an early field trial (onshore and perhaps offshore), with data examples, the lessons learned to date, as well as the road map to the final product/service.
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## Survey Operations Continued...

Session Chair: Ed Danson, International Sales Manager, C-Nav, UK

1150	<p>Simon Lightbody  <b>Marine Product Manager</b>  <b>Trimble</b>          New Zealand</p>	<p><b>The impact of new GNSS constellations on precise marine positioning</b></p> <p>Don't we have enough satellites to ensure 24/7 GNSS positioning? Actually we can always do with more. It's often hard to find the ideal GNSS antenna location on a vessel or rig so more satellites makes it easier to install antennae. Working in close proximity to offshore structures also blocks some of the sky so having more satellites available helps. The demand for greater positioning accuracy with more reliability is aided with more satellites. This presentation reviews the current status of all the GNSS constellations. We then look forward five years and give scenarios of services and accuracies that might be possible. With the doubling of the number of satellites, the corrections needed for precise GNSS, have also doubled so a new correction format is explained.</p>
1215	<p>Walter Jardine  <b>Lead Surveyor – North Sea Region</b>  <b>BP Exploration &amp; Production Ltd</b>          UK</p>	<p><b>Site surveys – An E&amp;P operator's perspective</b></p> <p>This paper presents key aspects of a large multi-site survey campaign in the North Sea. The presentation highlights successes and issues experienced specifically whilst conducting work in the Clair Field, West of Shetland, where over 2,600 line kilometres of survey data were acquired, along with a significant environmental baseline survey, to support appraisal drilling.</p>
1240	Lunch break and time to join colleagues at Ocean Business	

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## Survey Operations

Session Chair: Ian Holden, Manager - Survey Projects, Specialist Subsea Services, UK

1400	<p>Jan-Petter Mathisen  <b>Manager Seadata</b>  <b>Fugro OCEANOR</b>          Norway</p>	<p><b>Special oceanographic and meteorological events</b></p> <p>Fugro has carried out metocean measurements worldwide for over 40 years. The measurements have been mainly for the oil and gas industry, but have also extended to other sectors such as coastal engineering, government institutions and renewable energy. This paper will describe selected events and measurement set-ups, which will include: Polar lows and storms in the Barents Sea; Icing in the Barents sea; Current dynamics along the Norwegian Shelf Edge; Internal waves; Tsunami warning in Malaysian waters; Soliton early warning in Malacca Strait; Extreme wave heights.</p>
1425	<p>Eric Primeau  <b>Survey Team Leader</b>          Thomas Kasmer  <b>GIS Lead</b>  <b>BP AGT Region</b>          Azerbaijan</p>	<p><b>Use of the pipeline open data standard for pipeline survey operations and management</b></p> <p>The Pipeline Open Data Standard (PODS) provides a scalable spatial database architecture for the storage of pipeline data. While PODS is merely a data structure within a Geographic Information System (GIS) environment, it provides a standard data model that supports the needs of Pipeline Integrity Management (PIM). PODS is used for the creation and maintenance of pipeline centrelines and the stationing of all pipeline events along the route. The results of General Visual Inspections (GVI), and Inline Inspections (ILI) are added to the database to provide trending data that can be used by risk algorithm software, or be analyzed by integrity engineers. BP are at the point where we are identifying custom queries, reports and tools that can be used for PIM risk identification and mitigation. By having a solid PODS data foundation BP can enhance PIM functions and reduce the risk inherent in pipeline operations.</p>
1450	<p>Bent Warming Hansen  <b>VP Offshore Business</b>          Danny Wake  <b>Hydrographic Survey Specialist</b>  <b>Reson AS</b>          Denmark</p>	<p><b>Quantifying pipeline inspection capabilities with multibeam sonar</b></p> <p>Operating frequency, spatial resolution, beam densities and bottom detection robustness in potentially noisy acoustic environments are fundamental, interrelated properties which determine the success of any pipeline inspection survey using multibeam sonar. The question of, 'what might I detect?' in a given depth (or altitude) with a particular multibeam sonar remains as frequent today as ever, if not more so, as technology advances. This paper presents such an investigation, with the aim of providing the theoretical background to these properties and how they may be understood practically, so that they may be optimized when planning and executing survey. With this understanding, the best possible outcome may be achieved in relation to operational considerations and costs.</p>
1515	<p><b>Closing remarks</b></p> <p>Ed Danson, <b>Conference Chairman, International Sales Manager, C-Nav, UK</b></p>	
1530	Close of conference	