Issue 5

Aquasphere

Salvage team wins race against Antarctic clock

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The driving force behind Fugro's ROV success

Aberdeen opco wins Nord Stream pipeline contract

New Mumbai base serves fast-growing Indian Sector

Deepwater Shell project a success offshore Malaysia

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Fugro Subsea Services ROV pilot technician and intervention tooling recruits taking part in the Common Induction Programme in Aberdeen during March 2012.

Single induction programme for all new recruits

All new Fugro Subsea Services recruits are now going through a single comprehensive induction programme, wherever in the world they are based.

The Common Induction Programme Framework comprises a series of presentations, courses, workshop sessions and e-learning modules designed to introduce each new team member to the Fugro Group, their own operating company, ROV operations, subsea intervention, and offshore safety.

Designed and run by the Fugro Academy, the three-week programme is targeted at ROV, technical, inspection, tooling and engineering recruits.

Fugro Global ROV Training Manager George Robertson said: "This new initiative will ensure that all our recruits receive the same umbrella induction no matter where they are or which operating company they are working for.

"The content can be revised or supplemented to suit local opco business activities, but the core programme remains the same."

Week 1 includes an industry-wide survival course and any local mandatory industry or safety courses along with offshore medicals and inoculations, if required.

Week 2 topics include an introduction to local opco management, business line activities, and integrated management systems, offshore safety, and some practical workshop sessions.

Week 3 involves further classroom or workshop sessions focused on the recruits' business line. For example, ROV pilot technicians may get a one-week basic piloting course at a suitable Fugro Academy-approved centre such as Fort William Underwater Centre.

Mr Robertson added: "Further courses will be added as they are developed and Fugro Subsea Services business lines expand."

New contracts and projects

Woodside Energy has awarded the Greater Western Flank (GWF) Phase 1 Project subsea installation contract to Fugro-TSM. Engineering and design work is already under way as part of the contract — worth in excess of $AU 100 million — which will lead to a peak in offshore installation in early 2014 using the dynamically positioned multi-role vessel, the *Southern Ocean* (right).

Other recent projects won by Fugro-TSM include provision of MSV for **Saipem Bien Dong** (Vietnam); a call-out contract renewal from **Woodside Inspection Services** (Australia); and MOC pre-commissioning work for **TL Offshore** (Malaysia).

McDermott's has recently extended a long-term frame agreement for the provision by Fugro Survey Middle East of positioning, survey ROV and geotechnical services in the Middle East and India for another three years to the end of 2014. This contract extension continues a long and successful relationship dating back more than 30 years.

RasGas has awarded Fugro Survey Middle East a long-term contract for the underwater inspection of all its offshore facilities in Qatar. The contract began in 2011 and initially runs for four years with a further two-year option.

Statoil has agreed a five-year drill support fame agreement with Fugro RUE, Norway, for the Provision of ROV and tooling services. The call-offs will be awarded on a case-by-case basis to frame agreement holders only.

Centrica has awarded Fugro Subsea Services, Aberdeen, a one-year call off by for IRM services.

Complex currents add extra dimension to DeepWorks

Three-dimensional sea current profiles have been added to Fugro Subsea Services' **DeepWorks** family of subsea simulators.

Adding sea current profiles has widened DeepWorks modelling capability

Users can now model currents as they vary with depth and location, allowing for more realistic representations of current flows across large tracts of sea, in shallow waters and around targets. Complex current profiles can be quickly configured to improve understanding of the physical effects of currents on moveable bodies such as mooring lines, umbilicals, tethers, ROVs and divers as they are displaced in the water column.

A simple user-interface allows the operator to define the strength, heading and elevation of currents, at different geographic coordinates and depths, as a series of current profiles in a simulation. Once set up, the user can easily modify profiles for different segments of the mission being simulated.

Each current is defined as a 3D vector and a set of these defines a complex current profile from the sea surface to the seabed. With both horizontal and vertical interpolation, the current's strength and true direction is calculated for all positions in the current field.

This in turn allows the operator to predict the effects of currents during a lay, lift, pull-in or towed operation. During a cable-lay operation, for example, it is essential to understand how far the vessel heading must be offset from the trench to compensate for the effects of the current. In deeper water fields, complex current profiles make it difficult, unaided, to predict cable touch down accurately.

DeepWorks now enables different current settings to be tried under various scenarios to determine the safe operating envelope and helps validate procedures for optimal pay-out speed and vessel navigation.

Fugro Subsea Services' Robotic Technologies business line in Milton Keynes developed this new software. The 3D sea current profiles package is available now with new orders for DeepWorks and as an upgrade to existing installations.

Robotic Technologies Business Line Manager Dr Jason Tisdall said: "The ability to model complex currents adds an extra dimension to simulation. This is very useful when running engineering simulations in the office, but is especially valuable when integrated with live offshore operations.

"The ability to predict where subsea risers and umbilicals are in real-time based on the currents flowing is a powerful safety and cost-reduction feature."

Complex currents in the water column offer more realistic environmental conditions for training ROV pilots in station-keeping, navigation and performing intervention operations. Strong currents make close inspection, docking, stabbing and hook-up operations a lot more difficult than they would be in calm conditions. Pilots familiar with and skilled in operating in these conditions not only perform better under pressure but are also more aware of the hazards and limits of safe operation.

Accurate knowledge of current behaviour also provides dive teams with a better understanding of the safety constraints for pay-out and management of the diver's umbilical to avoid hazards.

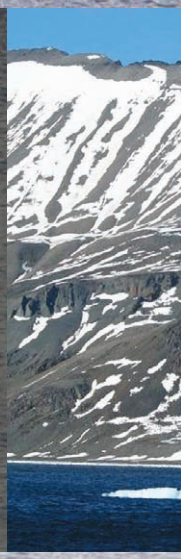
Dr Tisdall added: "3D sea current modelling is an important step forward in extending the boundaries of safety and efficiency in subsea operations."

DeepWorks is available to Fugro Subsea Services clients worldwide in Engineering, Live Operations Monitoring and ROV variants.

For more information about the new sea current profiles and DeepWorks in general, contact Simon Marr, Robotic Technologies Business Development Manager, on +44 1908 224670; S.Marr@fugrogrl.com.

The *Gulmar Atlantis* in Admiralty Bay during operations to refloat the navy barge.

Fugro to the rescue after navy barge sinks off Antarctic coast



A team from **Fugro Brazil** played a central role in a complex operation to salvage a barge containing 10,000 litres of fuel from the pristine waters of the Antarctic.

Fugro was involved in working with Petrobras to support the Brazilian Navy to re-float the barge, which sank in December 2011.

The barge had been offloading "Arctic diesel" to serve the navy's Commandante Ferraz Antarctic scientific base in Admiralty Bay, King George Island, when it was hit by a sudden change in the weather and went down in 45 metres of water, 500 metres offshore.

Time was of the essence as the salvage not only had to be completed during the short Antarctic summer, but the navy had to meet its obligations under the 1991 Protocol on Environmental Protection to the Antarctic Treaty which requires all member countries to respond rapidly to any situation threatening the fragile Antarctic environment.

The team from Fugro Brazil celebrate on board the *Gulmar Atlantis* after the barge is successfully refloated.

After extensive discussions with Petrobras and Gulmar Offshore, Fugro accepted the challenge and committed to developing a comprehensive one-week, rapid recovery plan involving the full resources of Fugro Brazil and the DSV *Gulmar Atlantis*, which was already under contract to Petrobras.

The vessel is permanently outfitted with a 300-metre water depth saturation diving system and 16-man diving team, plus FCV 3000 work class and Seaeye Lynx Observation class ROV systems. There is also a 14-tonne crane which was critical to the recovery operation.

Among the challenges that had to be overcome were

- carrying out a difficult task in an inhospitable and remote region with less logistical backup support than would normally be available
- completing the operation without any causing any pollution contamination from the barge's tanks, which not only posed a threat to the wider marine environment but also to the safety of the diving team
- working in extreme weather and temperatures, constantly mindful that the operation had to be finished before the onset of the rapidly advancing Antarctic winter.

Fugro's team worked from the DSV *Gulmar Atlantis* as part of the operation led by Petrobras for the Brazilian navy

The *Gulmar Atlantis* sailed from Brazil on 16 February and arrived on location on the 28th, when the Fugro team began by carrying out an ROV and diving inspection of the barge to confirm its position and status. This confirmed, the saturation divers began preparing to partially lift the barge and fix cargo straps under its hull. Then, despite several weather-related delays, the divers successfully attached the straps to the *Gulmar Atlantis* crane and the barge was safely brought to the surface.

The Brazilian navy then pumped the recovered barge's fuel cargo into containers on their vessel the *Admiral Masimiano*.

Throughout the delicate operation, the Fugro team took a series of precautionary measurements to ensure there was no environmental damage and the entire process was completed in seven days without any incident involving people, equipment, or materials.

On completion of all these operations the barge was transported to the shore for repair, and the *Gulmar Atlantis* then headed back to Brazil on 6 March.

The team's pivotal role was given full recognition by both Petrobras and the Brazilian navy and the complex challenges faced have further enhanced Fugro's reputation for dependability, competence and pro-active problem solving.

Fugro Brazil Subsea Intervention Superintendent José Figueiredo, who took part in the operation, said:

"This project, which on the face of it was a routine diving task, gave us an unrivalled opportunity to test ourselves and our systems in the harshest of environments.

"The winds were stronger and it was colder than anywhere else we have ever mobilised, and our success proved to everybody on board the *Atlantis* the critical importance of the Fugro culture of training and planning before any job.

"We are very proud of the contribution we made to completing the job within a week, despite all the challenges we faced."

Two charter vessels join fleet as inspection client base grows

Two additional vessels have been chartered by Fugro Subsea Services Ltd to meet increased client demand for ROV-based vessel inspection services.

The UK-based company's long-term inspection vessel — the *Skandi Olympia* — has now been supplemented by the *Normand Tonjer*, with the *Ernest Shackleton* due to join her on 1 June.

The DP Class 2 *Normand Tonjer* has been chartered from Solstad Offshore. FSSL has fully equipped the vessel for a series of intensive offshore programmes, including pipeline and structure inspections for Nexan, Centrica, and Talisman.

On board are two Tiger observation class ROVs and a Triton XL work class ROV. The vessel features the Fugro Starfix "satellite to seabed" suite offering integrated survey, positioning, real-time ROV digital video, and sensor capture. An offline suite allows rapid post-processing, digital video review, and plotting facilities. The vessel is also equipped with a Kongsberg Simrad HiPAP 500 acoustic tracking system for sub-surface positioning

The *Normand Tonjer*, chartered to boost Fugro Subsea Services' ROV-based inspection capabilities.

There is a 50-tonne @15m-rated crane which allows the vessel to be used for light intervention activities.

Accommodation includes 21 one-person cabins and 18 two-person cabins, and the helideck is rated for Super Pumas which allows infield crew changing

The *Normand Tonjer* was chartered for 200 days from 1 March 2012, and will be joined by the polar research and subsea support vessel the *Ernest Shackleton* from 1 June for 150 days. These additional vessels will assist in meeting the requirements of firm work from clients including Chevron and Conoco Phillips UK and Norway.

Derek Cruickshank, Managing Director FSSL, said: "We have had to charter these two vessels because we are being awarded more and more inspection work and need more capacity than we can supply with the *Skandi Olympia* alone."

More information about Fugro Subsea Services' inspection services from Derek Cruickshank on +44 (0)1224 257600; d.cruickshank@fugro.com.

Fugro makes the right connections in Angola

A team from Fugro-impROV has won praise for their role in helping solve a connection system challenge while working on the PSVM project in Angola Block 31.

A series of eight flexible flowline connections was needed between the top of the production riser towers and the FPSO — the towers are sitting in 200 metres with the wells below as deep as 1,200 metres.

BP recommended that Aberdeen-based Fugro-impROV supply and test three dedicated riser tower connection skids after Cameron had selected VerdErg Connectors' RTC system for the task. These skids are unique and were both designed and manufactured by Fugro-impROV.

The skids — which were slung on a construction class work ROV — had to secure the RTCs in mid-water at a 20-degree angle. As well as the pull-in and make-up of the connections, the skids had to

- install and change out hub sealing gaskets
- clean hub sealing faces
- remove pressure-retaining protective hub covers weighing 250kg.

The equipment supply contract — worth around £1.25 million — was completed in April 2011, and Fugro-impROV has since been conducing site receipt testing in Angola and wet trials. Five of the nine connections had been made by the end of April 2012.

An ROV is deployed in Angola with Fugro-impROV RTC skid.

Alan Duncan, Managing Director, Fugro-impROV, said: "We're now about two-thirds of the way through the ongoing offshore campaign to make up all the flowline connections, and we have received nothing but high praise for the job we have done.

"Senior personnel from BP, Cameron and VerdErg have all singled out our team for their professionalism, flexibility and the valuable contribution they have made to overcoming this challenge — from the design stage right through to installation."

Aberdeen opco wins €7.6 million Nord Stream pipeline contract

Aberdeen-based Fugro Subsea Services has been awarded baseline and post-hydrotest survey work worth €7.6 million on the Nord Stream pipeline project in the Baltic Sea.

Most of the 125-day operation will be carried out from the company's *Skandi Olympia*, with other Fugro companies and Russian partner Svarog contributing to an overall package which involves offshore, near-shore and dry surveys.

The one-year contract was getting under way in May 2012, with an optional one-year extension.

Nord Stream's development comprises two 48-inch gas export pipelines — Line 1 (West) and Line 2 (East). The operational area includes the exclusive economic zones of Russia, Finland, Sweden, Denmark, and Germany, and the territorial waters of Russia, Denmark and Germany.

The two pipelines are largely routed in parallel, with Line 1 to the north-west of Line 2. The offshore sections of each total 1,224km in length and reach a maximum water depth of 210m. Line 2 is expected to be operational in Q4 2012.

Fugro has been contracted to carry out the Line 1 baseline survey and Line 2 post-hydrotesting survey, which covers 150km. The Line 1 survey begins in Russia, travelling through the Gulf of Finland and Baltic Sea to Germany and covers the entire pipeline length, separated into three campaigns:

- Dry section and near-shore in Russia, carried out with Svarog and the vessel *Uglich*
- Offshore section carried out with the *Skandi Olympia*
- Dry section and near-shore in Germany, carried out with the *Skandi Olympia*

On board the *Skandi Olympia* are three ROVs — a FCV 3000 work class, fully equipped for pipeline inspection, plus a Lynx and a Tiger, both of them inspection class. The vessel is also equipped with the latest Fugro Starfix software.

The operational scope for 2013 — worth an estimated € €12.5 million in total — is expected to include the annual inspection of Line 1 and the baseline survey of Line 2, and to last approximately 170 days.

FSSL IRM Project Manager Alison Riley said: "This is a high-profile, large-scale project which we are delighted to be involved in. It's already presented us with a few challenges — for example, the document control for Nord Stream, FSSL and our subcontractors is an immense task — but nothing our team is unable to handle."

Most of the Nord Stream contract will be fulfilled from the *Skandi Olympia*.

Testing one of the work class FCV ROVs designed and built at Fugro Subsea Technologies' Loyang base.

The driving force behind Fu

For more than 20 years, Fugro's work class ROV systems have been designed and built by a dedicated team based in Singapore. And it's a track record of which they are justly proud...

The timeline dates back to 1990 and the beginnings of the specialist tooling that now not only forms the backbone of Fugro Subsea Services but also supports other divisions right across the group.

Fugro Subsea Technologies, or FST, was previously known as the Remote Technology Support Unit before being restructured under the Subsea Services Division in 2009 as a standalone operating company. This was three years after Fugro committed to making a substantial investment in ROVs and entrusted Singapore with transforming the Fugro Core Vehicles vision into a technical reality.

This commitment more than paid off: between 2007 and early 2012, 40 FCVs had been manufactured.

Now FST has a 90-strong team: four work from Aberdeen and the rest from a base in Loyang which has around 30,000 square feet of factory space for assembling new ROVs and refitting existing systems. Included are labs, stores, workshops, test and assembly areas, overhead cranes and a 450 bar pressure test facility. The inventory of parts and assemblies has a value in excess of €5 million and provides Tier 3 support to the Fugro ROV fleet, backed by engineers who provide onsite support worldwide.

FST has full certification for ISO 9001:2008, ISO 14001:2004 and OHSAS 18001: 2007, and stringent HSE controls won the team Fugro Golden SAM nominations in both 2009 and 2012. The management team reports to Chief Operating Officer Jim Sommerville and Global ROV Manager Jim Mann, and is led by Managing Director Jackson Chang who started his ROV career in 1991 with the design of the Sealion system.

Working for them is a dedicated team of mechanical, electrical and development engineers who are further supported by an experienced team of production planners, stores managers, and a 30-strong production workforce.

The FCV family of ROVs is at the heart of what they do, and FST currently manufactures four versions sharing many sub-assemblies, making them very supportable. They are the FCV 3000C, FCV 2000D, FCV 1000, and FCV 600. (The number denotes the depth rating.) FST also designs and builds the ROV's support system to ensure full integration and seamless operation: control cabin, workshop cabin, launch and recovery system (LARS), and tether management system (TMS).

First came the Sealion in 1991 — believed to be the first commercial work class ROV built in Asia — then Sealion Mk2 followed by the Seal, SeaPup, and Sealion 4-Vert, variously rated up to 100HP and 2,000 msw. The 3,000 msw and 4,000 msw Deep Water Sealion was introduced in the early 2000s, along with the G3 and G4, following in 2006 by the first FCV.

Sealion (early 1990s)

Seal

SeaPup

Sealion 4-Vert

DWSL

G3

G4

FCV 3000

FCV 1000

FCV 2000D

FCV 3000C

FCV 600 (2011)

gro's ROV success subsea

The first FCV was rolled out in late 2006 and they have been in active use since 2007, clocking up hundreds of thousands of dive time hours and building FST a strong reputation. Currently, FCV systems are working offshore Brazil, the UK, Norway, West Africa, the Mediterranean in Europe and North Africa, China, Asia Pacific, and Australia. When working offshore Brazil and West Africa, the FCV 3000 regularly dives to 3,000 msw for a range of intervention tasks, such as drill support, construction support, inspection tasks, and — increasingly — repair and maintenance. FCV systems are installed permanently on more than 10 vessels for deepwater construction support, geotechnical and geodesic operations, and also operate alongside divers, both in dive support mode and as an extension of the vessel's capabilities at greater depths.

The FCV has an excellent reliability record and on the rare occasions when one sustains damage, FST's in-house resources ensure operations can resume as quickly as possible. FST also manufactures related equipment including the Heavy Weather Deployment System (HWDS), Intelligent Valve Pack (IVP) for subsea tooling, simulator consoles, and fibre optics.

For Fugro, FST is more than just an ROV manufacturer: it is a specialist, in-house strategic partner for all subsea services opcos, providing a comprehensive technical and support service. This includes running training courses in conjunction with the Fugro Academy and hosting a web portal featuring an online help desk, a spares ordering system, and a technical forum and bulletin board. All manuals, drawings, schematics, and test certificates are also available online, and spares are provided for the legacy Sealion systems as well as for the FCV series.

The rapid expansion of Fugro's subsea services brings new challenges for FST, but the team is more than confident that they will meet these, pushing hard to attain new goals and consolidate their position as the driving force behind the division.

• *Lightweight FCV 600 boosts Fugro's European and African capability: p13*

The Fugro Subsea Technologies team at the opco's Loyang base in Singapore.

The *Fugro Adventurer* needed a range of 'hardening' fortifications before operations offshore Tanzania

Sailing safely into pirate country

The Arabian Sea and the Indian Ocean, the coast of East Africa, Somalia, Mozambique, Tanzania are all names synonymous with 21st century piracy, so when Fugro Survey Middle East sent the DP2 vessel *Fugro Adventurer* into the heart of this notorious zone it was not before calling in the experts, writes Guy Odell, FSME Business Development Manager.

In August 2011, Pan Africa Tanzania (PAT) approached Fugro Survey Africa in Cape Town for a range of services. This created an opportunity for a sister company when Fugro Survey Africa approached FSME's Offshore Geotechnical Division (OGD) to drill some geotechnical bore holes before the jack-up rig *Ben Avon* arrived on a site approximately 100 nautical miles south of Dar Es Salaam in Tanzania, to the north-west of the small island of Songa Songa.

Both Fugro companies were awarded contracts and also won follow-on work from South African energy company Sasol. This work was initially for some further geotechnical bore holes but Sasol also needed to remove two abandoned well heads — Njika 1 and Njika 2 — located in 350 and 430 metres respectively. The actual removal of these wellheads was carried out by Cut UK and Halliburton.

At this point, the logical solution was to combine Fugro's geotechnical services with FSME's ROV services, which were essential in supporting the wellhead removal.

A Sealion work class ROV was then mobilised onto the Middle East's Geotechnical vessel, the *Fugro Adventurer*.

The final piece in the jigsaw for the successful completion of this project was ensuring the safety of the vessel and its crew during both the transit and onsite operations. This task was managed by Drum Cussac, UK-based business risk consultants.

The outcome of a risk analysis identified the need for vessel "hardening" — the provision of physical and passive deterrents to anyone attempting to board the vessel. This involved "beefing up" defences with a layered protective system around and on board the vessel, including the introduction of detection and surveillance systems, warning areas and a declared no-go zone.

The "fortifying" of the vessel took place at FSME's base in Mussafah, AbuDhabi — the pictures highlight the measures taken to achieve this.

New Mumbai base serves fast-growing Indian sector

India's burgeoning exploration and production sectors are now being served by a dedicated Fugro Subsea Services business unit offering a range of services including work class and inspection class ROVs.

The new unit has its own project and commercial management team operating from Fugro Survey's existing Mumbai offices. All systems are being put in place for the division to be fully ISO 9001:2008 accredited by Q3 2012. All certifications, including ISO 14001 and OHSAS 18001, will be integrated into Fugro Survey India's integrated management systems.

Leading the new team is Captain Subramanian Swaminathan, Business Head, Subsea Services, who said: "Until now, Subsea Services in India have been managed through the Abu Dhabi office — FSME — with a project team based locally.

"We now have a fully-fledged team operating in Mumbai and will grow our existing pool of experienced ROV personnel in 2012 to ensure our clients get the full benefits of an Indian company able to respond quickly and efficiently."

Captain Swaminathan said the team's first project, a US $1.2 million contract providing a work class ROV for a Swiber Offshore pipe laying operation, was mobilised in December 2011 and was running up to the start of the monsoon period in May.

He added: "We are also working with the Fugro Academy and India-based vessel owner Great Offshore to set up a vessel-mounted ROV training simulator at their Mumbai base."

For more information about Fugro Subsea Services' Mumbai operations, contact Captain Swaminathan on +91 22 27629500.

Leading the new Indian Fugro Subsea Services team are (left to right) Business Head Captain Subramanian Swaminathan, Project Manager Abdul Nazim, Operations Coordinator Bimla Thakur, Logistics Assistant Vikas Salte, and Commercial Manager Anay Ghosh

Abu Dhabi team at heart of Arabian Gulf's first MFP installation

An Abu Dhabi-based Fugro Subsea Services team has played a key role in the successful installation of the first minimum facilities platforms (MFP) in the Arabian Gulf.

Occidental Qatar identified using directional drilling via the MFP — a design developed by Technip France — as a better route than installing new platforms to recovering more hydrocarbons from the Idd El Shargi oilfield east of Qatar.

Each of the MFPs had to be installed from a jack-up drilling rig

A series of three MFPs was initially required, and Fugro Survey Middle East worked with Oxy and Technip at all stages of the project, from performing the dimensional control during construction of the seabed template through to ROV-assisted installation and setting out the final topside cuts after pile-driving the conductors.

No diver intervention was necessary, which given the location contributed to the project carrying a relatively low risk profile, and a Fugro Sealion free swimming work class ROV was used throughout.

Space constraints posed the biggest challenge: for example, each MFP had to be installed entirely from a jack-up drilling rig, and the Fugro team worked with Oxy and Technip to enable installation with less than a metre of target position and less than 0.6° orientation tolerance.

The project — worth US $2.1 million — began in May 2010 and was completed in March 2012.

Guy Odell, Subsea Services Business Development Manager, Fugro Survey ME, said: "This was a challenging project, mainly due to having to work in constricted spaces, but we completed each of the installations successfully and with zero delay."

A Shell Xmas tree is manoeuvred from the *Havila Harmony* during operations in the GKA Field

Key role for Fugro in Shell's first Malaysian deepwater field

Fugro-TSM has recently completed a complex project as part of Shell's first deepwater operation offshore Malaysia.

Sarawak Shell Berhad and Sabah Shell Petroleum awarded the contract in 2010 for project management, engineering and the installation of a range of deepwater subsea production equipment in the Gumusut Kakap Field (GKA).

At the same time — and in an unusual step which added a level of complexity to the Shell scope — Fugro-TSM was contracted to Murphy Expro International to undertake similar subsea installation work in the Kikeh Field which, like GKA, lies about 120km off Sabah.

Fugro-TSM's installation support vessel, the *Havila Harmony*, was used for both operations, which began in November 2010, lasted 455 days, and were completed in March 2012. The combined Shell and Murphy contracts totalled $40 million.

The GKA host is a semi-submersible floating production system configured for a mild, non-cyclonic environment but within the Indian Ocean earthquake zone and in depths ranging from 945 metres to 1,210 metres. All wells are subsea, with oil and condensate exported via a pipeline to shore.

The Fugro-TSM scope for Shell was separated into two phases — onshore project management, engineering, planning and preparation; and offshore installation.

Phase 1 included

- liaison with hardware manufacturer and drilling contractor
- engineering analysis
- development of emergency response, installation, mobilisation procedures, and bridging documentation.

Phase 2 included

- mobilising the *Havila Harmony* to the port of Labuan
- pre-installation survey
- installing tubing head spools, enhanced vertical deepwater trees, and well jumpers
- surveying installed subsea hardware.

The work for Murphy was very similar in scope, and included installing suction piles, pipeline end terminations, subsea Xmas trees, and well jumpers, as well as relocating, recovering, repairing and installing hydraulic flying leads.

Geoff Hogg, Commercial Director, Fugro-TSM, said: "We needed to take a fully integrated team approach to deliver both contracts, and we played a key role in ensuring that not only was the offshore phase executed safely but also that all parties worked together in a safe, open and seamless way.

"Both projects were run under the control of the Fugro-TSM Integrated Management System Safety Case and in accordance with our HSE plan and vessel working procedures. Before offshore operations began, a complete HAZID was conducted with all raised items identified and closed out."

An experienced Fugro-TSM intervention engineer worked with the hardware manufacturer, FMC, to ensure all aspects of running tool modifications and re-instatement were included in the installation design process and met strict administration requirements.

At the end of the contract, the *Havila Harmony* demobilised from the port of Labuan.

An important element of the operation was to ensure the project's learnings were captured for future use, and this was done in two forums — project debriefing sessions held onboard before arrival in Labuan, and a project lessons learned session held at Fugro-TSM's base in Perth. Client representatives attended both.

Mr Hogg added: "The importance of our involvement in Shell's first deepwater prospect in Malaysia cannot be over-stated, and we again demonstrated our ability to collaborate at every level, in this case integrating the schedules and work scopes of not one but two clients in a remote work location to deliver complex deepwater solutions that met both their requirements."

Latest lightweight ROV boosts intervention support

A new compact work class ROV has been added to Fugro Subsea Services global capability.

The lightweight FCV 600 evolved from the proven deepwater FCV 3000 already used on Fugro Subsea Services' construction vessels and repackages most of its main components in a more compact frame with a smaller buoyancy block.

This delivers a reliable, easily maintained ROV with high thrust which can be TMS-deployed or free flown. The system has been specifically designed for underwater intervention tasks in support of oil, gas, and renewable energy projects.

The FCV 600's lightweight modular launch and recovery system is designed to fit where deck room is at a premium, with the whole system taking up about a third less space and weighing less than half that of a standard ROV.

A reduced "sail area" gives the FCV 600 a huge power-to-weight advantage, and the addition of the Fugro tracked skid means it can operate on the seabed in up to seven knots of current. High capacity single-mode fibre optics are used as the prime communications link for all video and data signals between the vehicle and surface control, delivering exceptionally high quality video quality and plug-and-play sensor and equipment capability.

FSSL ROV Technical Manager Alan Anderson said: "At the heart of the FCV 600 is Fugro's proven control and communications system based on single-mode fibre optic technology.

"This delivers an exceptionally high data throughput and features automatic switching in the event of fibre failure. We have complemented this with high-end multiplexer capability able to handle up to three HD cameras and twelve conventional cameras — eight of them simultaneously — and to allow for a wide range of data communications protocols for the efficient integration of add-on tools and sensors.

"The Fugro control system can also be found in the TMS and optional IVP, and this makes the FCV 600's control solutions one of the most versatile available."

The FCV 600 also features a built-in high-flow dirty work pack which saves space and ensures the simple, reliable interface of proprietary tooling skids, extra tools and equipment, so saving on trips to the surface to change tools.

More information from Alan Anderson on +44 1224 257609; a.anderson@fugro.com

FCV 600 ROV Specifications

ROV	2.5m x 1.8m x 1.6m	@ 2.65T
TMS	2.1m x 2.1m x 2m	@ 2.1T
LARS / crane	4.4m x 2.5m x 3.9m	@ 12T
Control cabin	6m x 2.5m x 2.7m	@ 14T
Stores workshop	6m x 2.5m x 2.7m	@ 14T
Winch / HPU	3.5m x 2.5m x 2.7m	@ 17T
Total weight	61.75T	

The compact FCV 600 ROV is now available for Fugro Subsea Services clients in Europe and Africa.

Perth team tackle carbon footprint

More than 75,000 native trees are being planted in Western Australia, thanks to an initiative by Perth-based Fugro-TSM.

The company is working with Carbon Neutral, also based in Perth, on a three-year programme to offset emissions associated with both vessel fuel consumption and staff air travel.

Once planted, the trees will offset more than 12,000 tonnes of CO_2, the rough equivalent of taking 3,500 cars off the road.

Fugro-TSM Commercial Director Geoff Hogg said: "We believe it's vital to understand and take responsibility for our impact on the environment.

"Our commitment to reduce our carbon emissions is genuine and we know the cost is far outweighed by the importance of our efforts."

And the Fugro-TSM team have been getting personally involved: a group of employees helped regenerate a barren area of land with more than 4,800 seedlings during a staff tree-planting day in Moorbinning, near Beverly, WA.

Fugro volunteers take part in the tree-planting day in Moorbinning.

Carbon Neutral CEO Ray Wilson said Fugro-TSM's contribution was significant.

"They are helping restore our Australian rural landscape, which has many other benefits including reducing soil salinity, reducing erosion, enhancing biodiversity, and restoring habitat for native animals."

BP applauds Egyptian safety compliance

Fugro Subsea Services' Egyptian operating company has been congratulated by BP for demonstrating exceptional health and safety compliance.

BP Egypt Marine Survey Manager Nat Usher said Fugro SAE Egypt's management had "demonstrated complete commitment to achieving the highest possible standards and are obviously motivated to delivering safe and efficient operations".

Fugro SAE achieved an OGP HSSE Management System audit compliance score of 84%, which Mr Usher said was the highest the auditor had recorded among the geophysical companies audited by BP.

In a letter dated 5 March 2012 to Fugro SAE General Manager John Evans, he added: "All the diligent work Fugro have undergone to bring the HSSE MS into rigorous OGP compliance is impressive. You have a truly robust and comprehensive management system."

Aberdeen team raise over £6,000 as cancer charity 'thank-you'

Staff at Fugro Subsea Services in Aberdeen have donated over £6,000 to a local cancer charity as a "thank-you" for supporting one of their colleagues when he was diagnosed with the disease.

The staff — based at Fugro Subsea Services' Bridge of Don offices — chose Friends of Anchor as their charity of the year for 2012 after ROV Services Business Line Manager Andy Stewart was treated at the Aberdeen and North Centre for Haemotology, Oncology and Radiotherapy.

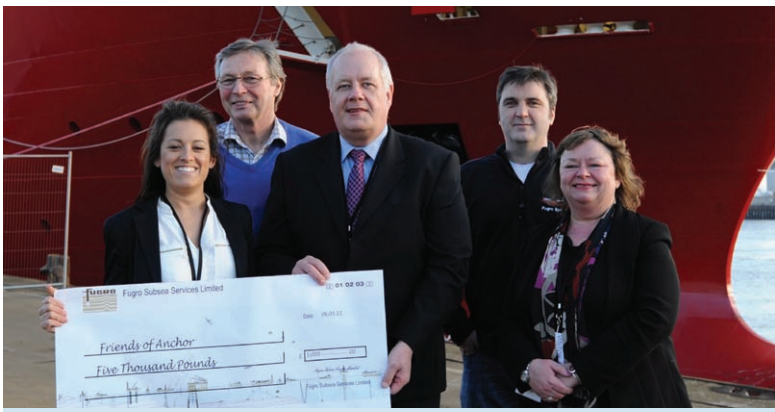
Florence Gauld, FSS Construction Support Business Line Manager, said: "Seeing Andy come out the other side from cancer and make a complete recovery has been fantastic — and it's thanks to the care and dedication of the Anchor unit staff.

"Our goal was to increase on the initial donation of £5,000 which we hope will go some way towards expressing our heartfelt gratitude for the wonderful care the Anchor unit team gave to Andy and give every day to the hundreds of patients who come through their doors."

Friends of Anchor Fundraising Manager Sara-Jane Milne was presented with a cheque for £5,000 on board the *Fugro Symphony*, the company's newest ROV support vessel and the largest in the fleet, during one a visit to Aberdeen Harbour. Further donations totalling more than £1,000 have since been made.

The Anchor unit is based within Aberdeen Royal Infirmary, the city's major hospital.

To support FSS' ongoing fundraising efforts, contact **FSSLCharityCommittee@fugro.com**.



Friends of Anchor Fundraising Manager Sara-Jane Milne (far left) accepts a cheque for £5,000 from (left to right) Jarle Molnes, captain of the *Fugro Symphony*, ROV Services Business Line Manager Andy Stewart, Davie Provan, *Fugro Symphony* Offshore Vessel Manager, and Florence Gauld, Construction Support Business Line Manager.

FSME Managing Director Michael Dravitzki (to the right of the Abu Dhabi commemorative plaque) and team members with (next right) Peter Christensen, Maersk Oil Qatar HSSEQ Manager.

Maersk honours Gulf opco's zero LTI milestone

Gulf-based Fugro Survey (Middle East) has passed a significant health and safety milestone, recording 1,000 zero lost time incident days — the equivalent of 3.6 million man hours.

The achievement — logged on 28 September 2011 and now surpassed — has been celebrated by major client Maersk Oil Qatar which in November presented FSME management with a commemorative plaque for the company's Abu Dhabi office.

Darren Male, FSME HSE/QA Manager, said: "Achieving this milestone endorses our commitment to providing an accident-free workplace and reflects both Fugro's safety expectations and those of our clients."

FSME has been providing Maersk Oil Qatar with a full range of rig positioning, survey, geophysical, geotechnical, ROV, and weather forecasting services for nearly 20 years under a general services contract.

The LTI milestone was achieved across a range of projects, not just those involving Maersk.

Fugro Subsea Services Managing Director Derek Cruickshank (centre) with Chevron Upstream Europe Supply Chain Manager Sean McCann and Managing Director Brenda Dulaney.

Chevron partnership accolade for UK team

A team from UK operating company Fugro Subsea Services won a key award at a health and safety event organised by Chevron Upstream Europe.

More than 200 contractor representatives took part in the one-day 2012 Chevron Health Environmental and Safety Management forum in January which focused on three topics for which there were three awards — performance, people, and partnership.

The FSS team won the partnership award for their

- approach and solutions which led to a successful offshore campaign on Chevron's Captain FPSO for the change-out of vessel thrusters and intervention on the hull sea chests, carried out from the *Fugro Symphony*
- continued positive safety performance over an extended period
- close working relationship with Chevron's engineering department.

Fugro-TSM picks up key Australian awards

Perth-based Fugro-TSM has won two prestigious Industrial Foundation for Accident Prevention Safe Way Achiever awards.

Staff were presented with the awards during the 32nd annual IFAP gala dinner at Perth Convention Centre in October 2011.

Fugro-TSM — formed after the acquisition in 2011 of TS Marine by Fugro and the merger with Fugro Subsea Services Pty — was awarded one gold award in recognition of the company's safety management system and a second for successfully achieving six months without a lost time injury.

Fugro-TSM Commercial Director Geoff Hogg said: "These awards both recognise the positive safety culture at what was Fugro Subsea Services Pty and reflect our ongoing commitment to safety at Fugro-TSM and the good cultural fit of the two companies. We look forward to more outstanding achievements in the future as we maintain our focus on safety as one team at Fugro TSM."

Two other Fugro companies — Fugro Spatial Solutions and Fugro Survey — also won awards, and altogether 63 Western Australian businesses from a broad range of industries were recognised for their safety achievements at the event, which was attended by around 420 people.

Collecting their IFAP awards are (left to right) Kym Wong, Fugro TSM Co-ordinator, Vera Mars, Fugro Spatial Solutions HSE Manager, and Fugro TSM Commercial Director Geoff Hogg.

Accolade for flagship vessel's offshore regime

The *Fugro Symphony* (left) with sister ship, the *Fugro Saltire*.

Maersk Oil has marked Fugro Subsea Services' commitment to safety in the North Sea Gryphon Area Recovery Project with a new award.

Recognition came in March 2012 after the flagship *Fugro Symphony* completed the first section of a multi-phase, multi-vessel programme to recover and dispose of subsea structures and equipment damaged during the Gryphon FPSO storm incident in 2011.

Maersk Oil had set in place an Incident-Free Award Scheme to encourage positive safety management across the project, and presented the *Fugro Symphony* team with a certificate "to celebrate a safe and successful trip" and a donation which is being shared between the vessel welfare fund and a nominated charity.

FSSL Subsea Services Manager for Europe and Africa Grant Aitchison said: "It is very rewarding to receive this recognition for the effort we put into managing our operations safely and to be the first Gryphon Project contractor to receive the award.

"The *Fugro Symphony's* offshore personnel have worked hard to bring the onboard safety culture up to a very high standard in a relatively short time as we only took delivery of the vessel in June last year.

"We will all take encouragement from this award and aim to demonstrate the same strong performance until the end of the project."

The Gryphon Project continues in phases until September 2012. As well as providing survey and ROV services from *Fugro Symphony*, Fugro is also providing ROV services for four Technip DSVs.

Contact Information

Australia
Fugro-TSM
Level 6, 256 Adelade Terrace
Perth, Western Australia 6000

T: +61 8 9218 2000
Contact: Ian Rowson
E: ian.rowson@tsmarine.net.au

Brazil
Fugro Brazil, Serviços Submarinos e Levantamentos Ltda
Rua do Geologo, 76 Zona Especial de Negocios
ZEN 28.890-000, Rio das Ostras RJ, Brazil

T: +55 21 2125 8500
Contact: MJ Scholtes
E: m.scholtes@fugro-br.com

Egypt
Fugro SAE Egypt
Oil Services Complex, KM12,
Old Ain Sukhna Road, PO Box 2
Katameya, Cairo 11936, Egypt

T: +20 (0) 2 2758 0299
Contact: Brian Stewart
E: b.stewart@fugro-uae.com

India
Fugro Survey (India) PVT Ltd
Fugro House, D-222/30 TTC Indl Area
MIDC Nerul, Navi Mumbai – 400 700

T: +91 22 2762 9500
Contact: Swaminathan Subramanian
E: s.swaminathan@fugro.in

Middle East
Fugro Survey (ME) Ltd
Plot 1F, Sector MN1, Mustafah, Abu Dhabi, UAE

T: +971 255 47810
Contact: Brian Stewart
E: b.stewart@fugro-uae.com

Singapore
Fugro Subsea Technologies Pte Ltd
35 Loyang Crescent, Singapore 509012

T: +65 6861 0878
Contact: Jackson Chang
E: jchang@fugro.com.sg

Fugro-TSM Pte Ltd
35 Loyang Crescent, Singapore 509012

T: +65 6546 1163
Contact: Jason Hewlett
E: jason.hewlett@fugrotsm.com

Norway
Fugro RUE AS
Stoltenberg 1, NO-5527, Haugesund, Norway

T: +47 52 86 48 20
Contact: Bjoern Brunborg
E: b.brunborg@fugro.no

UK
Fugro Subsea Services Ltd
Fugro House, Denmore Road, Bridge of Don
Aberdeen AB23 8JW, United Kingdom

T: +44 1224 257 600
Contact: Derek Cruickshank
E: d.cruickshank@fugro.com

Fugro-impROV Ltd
Kirkhill Commercial Park, Dyce Avenue
Dyce, Aberdeen AB21 0LQ, United Kingdom

T: +44 1224 709 767
Contact: John Walker
E: j.walker@fugro-improv.com

USA
Fugro-impROV Inc
8715 Fallbrook Drive, Houson, TX 77064, USA

T: +1 832 912 9009
Contact: Alan Duncan
E: a.duncan@fugro-improv.com

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and The Front Room Design Company | **www.frontroomdesign.com**