Deepwater pile installation from the back of a boat – a complete success

New portable navigation system raises vessel availability

Taking subsea tree installation off the critical path
MONITORING GOES ACOUSTIC
WATCH YOUR STEP
MOVING IN THE RIGHT DIRECTION
DRIVING SAFELY
FLEXIBLE SOLUTION

DIARY
4–7 September Offshore Europe 07, Aberdeen, UK
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In this issue of S2S, we have included an article about how Trident Offshore, based in Aberdeen, is using newly developed navigational technology to enhance its rig and floating production, storage and offloading facility moving services. This is a perfect example of what Acteon, as a group, has set out to accomplish: to bring innovative technology to bear on our clients’ operations in the area between the seabed and the surface.

Communicating freely with our clients is vital to ensuring that our capabilities develop in line with market needs in this demanding arena. S2S is just a part of that communication drive. Help to make it a two-way process by letting us know what you think about the magazine and the technologies and projects reported in its pages. We welcome your feedback and, naturally, we will always be keen to discuss the particular challenges you face in linking seabed to surface.

RICHARD HIGHAM
GROUP CHIEF EXECUTIVE, ACTEON

It is always exciting to see new technology being introduced successfully into our industry. Just as satisfying is seeing the application range of a technology widen as people in the field begin to explore its full potential. There are some great examples of both in this issue of S2S.

We highlight the recent successful use of InterMoor’s CASIM system to install subsea trees in the Gulf of Mexico. This adds a new dimension to CASIM, which already has a successful track record of aiding the deployment of suction piles, plate anchors and other items of subsea equipment.

We also report the launch of 2H’s acoustic data loggers. These devices simplify data recovery from stand-alone riser and mooring monitoring systems, and make them much more interactive. This should be of immense benefit to the offshore integrity management process in the years to come.

Having a diverse client base such as ours means we are faced with an unusually wide variety of challenges. It is good to have so many opportunities to demonstrate what we can do. I hope you enjoy learning a little about our companies through the pages of S2S – and that some of the articles may spark ideas for new applications in your businesses. If so, we would be delighted to hear from you.

KEVIN BURTON
VICE PRESIDENT, TECHNOLOGY, ACTEON
Growing the business

Acteon continues to deserve its reputation as the fastest growing subsea company in the world with the acquisition of four companies within two months. Following the purchase of project management services company Pacific Management Technologies Inc. in June (renamed InterAct PMTI), a further three companies were acquired a month later.

Advanced marine survey sector company Seatronics; moorings specialist International Mooring Systems (IMS); and automated chain testing, equipment and inspection specialist Chain Corporation International (ChainCo) were previously owned by Aberdeen-based Craig Group. It is expected that the new companies will take Acteon’s combined annual sales to $400 million.

This expansion brings the total number of Acteon companies to 15 and significantly extends the group’s geographic base: InterAct PMTI’s current workload involves projects offshore California and in the Gulf of Mexico, and Seatronics, IMS and ChainCo will strengthen Acteon’s presence in the Middle East and Asia.

Soft restraint system aids Shearwater drilling

Workover operations in Shell’s Shearwater field in the North Sea are being aided by an unusual riser support system fitted to GlobalSanteFe’s Magellan drilling rig by Claxton Engineering. The system is designed to control the deflection of the workover riser caused by horizontal movement of the rig relative to the fixed jacket platform – and hence reduce loadings on the surface tree as well as on the riser itself. The ultimate goal is to maximise operational rig time.

The system is unusual for two reasons: first, it applies to the horizontal movement of the rig rather than the vertical, and second, it provides soft restraint using a combination of hydraulic dampers and compensating weights. The hydraulic elements of the system permit the riser to deflect along with the rig as a result of differential movement between the platform and the rig (during normal weather conditions), thereby ensuring maximum operational time. In addition, there is a “weak link” between the riser and the hydraulics in the form of fixed-weight anchors inside guide tubes, which are secured to the rig. As soon as the riser reaches its deflection limit, the weights lift to allow the rig to continue moving, while limiting any further deflection of the riser.

The system was installed on the Magellan during February 2007. So far, it has performed exactly as intended.
Reel with a difference

Aquatic Engineering & Construction Limited has added a new reel to its already extensive equipment rental inventory. The reel has a 9.2-m diameter flange with a 5-m diameter hub, and is DNV-approved to carry 300t of flexible pipe, umbilical or cable – all fairly standard.

However, the new reel is quite different in one very important respect: it has been designed by Aquatic so that it can be easily dismantled into components small enough to be carried on the back of conventional articulated lorries or in standard, open-topped shipping containers. This has huge cost and logistical advantages when it comes to transporting the empty reels to collect product, or when returning them once a project is finished.

Aquatic has rigorously pursued a policy of enhancing the operational flexibility of its powered reeling equipment range for several years. Drive towers that can be dismantled for ease of transport have been available for quite some time. The reel perfectly complements the existing equipment range and enables Aquatic to cost-effectively deliver a complete lay spread by road.

The reel perfectly complements the existing equipment range and enables Aquatic to cost-effectively deliver a complete lay spread by road.

Tampen Link hot tap

Claxton Engineering has been preparing for a crucial hot-tapping operation in support of Statoil’s Tampen Link project, the construction of a major new pipeline system to transport dry gas from the company’s North Sea Statfjord field to St Fergus on the UK mainland via the existing FLAGS (far north liquids and gas system) pipeline.

As part of the project, a 10-in T-connection is required into an existing 20-in infield gas pipeline. The T-connection will be created by hot tapping into the 20-in pipe, which is in 14m of water and operates at 160bar. Claxton worked closely with Mirage Machines, a second Acteon company, to build the hot-tapping system. A series of pressure and cutting tests has been carried out at Claxton’s yard in Great Yarmouth, UK. Now, the system is undergoing final tests in Scotland before the company goes offshore with Technip, the main contractor responsible for the subsea structures and tie-ins on the Tampen Link project.

Tahiti progress

Fabrication and testing of the various components of the riser monitoring system for Chevron’s Tahiti development in the Gulf of Mexico are well under way at 2H’s facility in Woking, UK. The system will be used to monitor a 2000-m steel catenary riser conveying production fluids from the seabed to a spar platform, which is due to be installed early in 2008.

Sensor packages will be attached to four riser joints in the seabed touchdown region and two joints immediately below the point where the riser hangs off the platform. Each package will comprise separate motion and inclination sensors plus one of the company’s latest INTEGRisticks™ to monitor strain and bending radius. Signals from the sensors will be transmitted to a control unit on the platform via a fibre-optic link contained within an umbilical running the length of the riser.

Chevron’s stated reason for having the system is to verify the engineering assumptions made during the design phase and to maintain a check on the fatigue life of the riser throughout its period in operation. 2H will ultimately provide specialist data analysis in support of both these goals. Because the system will be attached to the riser at the same time as the riser itself is being installed and will then be required to work for the life of the riser, robustness and reliability will remain high on 2H’s agenda during the course of the project.
Hurricane-proof engineering

Innovative application of an abrasive-cutting technique by WellCut Decommissioning Services Inc. has helped a large Gulf of Mexico operator to hurricane-proof a tension leg platform.

In 2005, Hurricane Katrina blew the platform’s drilling rig off the two parallel I-shaped supporting beams, causing both severe damage and subsequent lost production. To prevent this from recurring, the operator’s engineers designed a locking device to hold the rig stationary during storms. This required cutting 120 slots in the 3-in thick supporting I-beams.

The engineers had planned to burn the holes with welding gear, but WellCut was awarded the work after persuading them to evaluate the company’s capabilities with abrasive-cutting techniques.

“We set up a competition in the yard,” explains Maxie McGuire, vice president, WellCut Decommissioning Services. “Burning holes can be fast, but it leaves such a rough finish that further machining is necessary. In contrast, our precision abrasive cutting system achieved the required quality and tolerances in a single cut – it was actually four times faster overall. Moreover, the abrasives are not combustible, so there are safety benefits.”

WellCut completed the work in early 2007, and requests for similarly custom-engineered abrasive-cutting solutions have since come from other operators.

Second CoSMOS™ platform

UWG has been awarded a contract by a leading, independent North American operator to provide a conductor-supported minimum offshore structure (CoSMOS) for the development of one of its key assets off the coast of West Africa.

The scope of work includes the detailed design of the platform and specialist support during the fabrication and installation phases of the project. The nine-slot wellhead platform will be situated in 35 m of water and have facilities for processing the field’s high-wax crude oil and exporting the product to a nearby floating production, storage and offloading facility.

CoSMOS platforms are unusual in that the topsides facilities are supported on the well conductors. This reduces fabrication costs because there is no need for a separate steel jacket. Installation costs are also minimised, as the platforms are designed to be installed from the jackup rig used to drill the wells.

Design engineering has already started at UWG’s office in Norwich, UK. Fabrication is due to begin in August 2007, with installation planned for mid-2008.

UWG’s first conductor-supported platform, a compact five-slot structure, was installed in 17 m of water in the Morsa West field offshore Angola in late 2005.
Monitoring goes acoustic

Deepwater riser monitoring has come a long way in recent years. Part of the reason for this is the efforts made by 2H Offshore to convince the industry of the importance and value of monitoring and also to develop accurate and reliable sensors and logging systems, the key to converting the concept into a reality.

In relatively simple monitoring systems, data from motion and strain sensors are recorded using stand-alone loggers attached to the riser at various locations along its length. These locations are selected on the basis of the anticipated response of the riser system. Data are literally brought to the surface periodically using ROVs to recover the loggers.

Online systems use the same types of sensor; however, with these, data are constantly transferred to the surface via electrical umbilical cables. While this offers clear advantages to the user – notably, immediate access to the data – system installation is less straightforward and the subsea cables add to the overall cost and complexity of the systems.

According to Karim Jan, 2H’s sales and marketing manager, the company’s latest product – an acoustic data logger, the INTEGRiPod™-MA – offers the simplicity of a stand-alone system with the increased versatility of an online version. He says, “The new device builds on the standard INTEGRiPod data logger, of which more than 300 have seen service in over 50 monitoring applications around the world, at depths to 2800 m. The unit has the same pressure-rated and corrosion-resistant container as the standard logger. Something else it has in common with the standard logger is that it works with the full range of 2H INTEGRi sensors. This means that parameters other than motion, such as temperature and pressure, can also be monitored online using the system.”

Data are easily retrieved from the new loggers using a dunking acoustic modem, which can be either pole- or winch-mounted on the surface facility. Significantly, the loggers can also be reprogrammed via the modem. “Should environmental conditions change or response anomalies occur, the operator can alter the frequency of logging or concentrate on selected measurements,” says Jan. “For example, if a severe storm is forecast, the system can be put into almost constant monitoring mode. Once the threat has passed, the recorded data can be quickly accessed to determine the condition of the riser and to help make decisions on resuming production. The device enables sensing to be carried out on demand; we believe that, ultimately, the new technology has the power to increase uptime and deliver significant added production value.”

Another advantage of acoustic logging systems is that they can be retrofitted using ROVs. In practical terms, they are no different from stand-alone systems and can be installed with minimal disruption to normal operations.

“This latest development illustrates how far riser monitoring has progressed,” says Jan. “We can now provide a range of off-the-shelf monitoring equipment that can be readily configured to meet operators’ individual needs. From being a research technique a short time ago, riser monitoring has evolved into a highly practical and interactive integrity management tool.”
UWG’s Spudcam system eliminates the need for ROVs by using a camera assembly (subsea video camera, white LED light sources, actuator and extendable arm) attached to a track secured to the side of each of the rig’s legs.
Track secured to the side of each of the rig’s legs. The tracks are fixed to the leg when the jackup rig is in dock and remain there permanently.

In operation, the rotational pivot at one end of the camera assembly is attached to a carriage, which rides along the track. Controlled from the surface, the camera assembly is lowered, under its own weight, to a position near the base of the leg just before it is fully extended. The pivot enables the arm to move ±90° from the horizontal. The articulated joints allow full freedom of movement for the camera so that the seafloor all around and beneath the spud can is viewable. High-quality images are received throughout the operation and are digitally recorded at the surface. If required, a slave monitor can relay the information to teams in different locations on the jackup rig. Using these images as a guide, it is possible to locate the spud can on a fresh area of seabed, or in the exact centre of an existing spud can depression.

Once the site is confirmed as clear and safe, the camera arm is folded against the track. The whole assembly is then pulled away from the base of the leg using a surface winch attached to a steel rope, which forms part of the cable bundle. This cable bundle also includes hydraulic and electric lines to supply the camera system.

Typically, the camera system will be lifted from one leg to the next to repeat the operation. However, to speed up the installation procedure, individual Spudcam systems can be fitted to each leg of the jackup and run in parallel – another advantage over the use of an ROV for the operation.

Owing to the relative low-cost of the system, Gary Omer, projects engineer (electronic products), UWG, envisages a rig having one or two camera systems permanently available to send down the tracks and inspect the jackup structure on a regular basis. He says, “Very high resolution colour camera systems, with excellent very low light characteristics, are now much more widely available. Such systems offer considerably enhanced performance, which can be readily applied to a wide variety of new applications that could not previously be viewed in real time, and/or without using ROVs. Reducing dependency on ROVs has major weather window availability benefits and is a very cost-effective alternative.”
Moving in the right direction

New portable navigation system raises vessel availability

With the cost of hiring anchor-handling vessels (AHV) often approaching $200,000 a day, making full and efficient use of their time has become imperative for Acteon clients. To help operators do this, Trident Offshore has launched a portable navigation aid called TriADS (Trident attitude and direction system). Based on the successful TriPOD (Trident positioning over data link) system, TriADS includes differential global positioning system (DGPS) vector heading and remote configuration options.

“Putting a ‘pod’ on the vessel” has become a familiar phrase heard from its clients since Trident became the first company to combine a navigation computer, a DGPS receiver and a radio modem telemetry system in a single box (TriPOD). Eliminating the mass of cables required to connect the individual elements of a navigation package and simplifying the set-up instructions have meant that TriPODs are regularly configured and tested onshore, passed to an AHV from a rig and then mobilised by the vessel’s crew at sea. However, for applications requiring a gyrocompass – where a vessel’s heading is required in addition to its position – the AHV needs to return to harbour to install heavier precision instruments and for offset measurements and gyro calibration values to be configured in the navigation software.

Recognising the time delay that gyrocompass installation was causing, Trident developed TriADS with the option of connecting it to either a DGPS heading sensor or a standard gyrocompass. Once stabilised, the heading sensor has a potential accuracy of ±0.5°; during initial trials conducted on a Chevron rig move in April 2006, the TriADS unit maintained a consistent accuracy within 2° in comparison with a survey-grade gyrocompass also installed on the AHV.

A recent project in the North Sea for Maersk saw four TriADS units successfully working together to first install on location and then control the swing heading of a floating production, storage and offloading vessel (FPSO) while a dive vessel came alongside to perform some extended maintenance. TriADS units were placed on the FPSO, the primary AHV and the two heading control tugs used to swing the FPSO. The systems ensured that the FPSO and the dive vessel were held in position for the duration of the operation without failure. The project lasted for four months. This same system was requested by the client for work in the second quarter of 2007.

Mike Grubb, survey manager, said, “GPS heading sensor development is moving at a rapid pace, and while the current system’s accuracy does not match that of a survey-grade gyrocompass, it is excellent for most of our AHV operations. After all, there is no practical advantage in positioning a stern roller to within 0.1° when the vessel is to lower an anchor from the stern roller through a water depth in excess of 100 m to a target of approximately 10 m on the sea floor.

“When the European GNSS [Global Navigation Satellite System, commonly known as Galileo] network is available next year, the pinpoint positioning that will be possible is likely to mean that satellite-derived heading systems will be utilised by most operators and that the use of survey-grade gyros will decrease.”

TriADS units are now used on most rig moves requiring heading-stabilised HV navigation systems.

Trident has also developed a system to remotely configure TriADS units using a wireless PC network. With a vessel on station outside a rig’s 500-m safety zone, Trident can upload and configure new navigation software for a project in a few minutes. This simple procedure replaces the current process of bringing the vessel alongside, transferring the TriADS to the rig and updating the instructions, before passing it back to the vessel for reconnection and powering up.

The remote connection has been tested up to 900 m away, and has been used by engineers on the rig for direct fault diagnostics as well as for uploading project plans or corrections. The remote control and configuration facility of TriADS enables the rig-based navigation engineers to upload revised drawings and alter the configuration of the proposed positions on the AHV’s navigation screen. It is often the case that the client needs to change the proposed mooring spread at short notice, possibly through rig anchor winch problems; any such changes can be passed to the AHV navigation system remotely, which saves hours of operational time.

In addition to speeding up the corrections on a single project, reconfiguring the navigation system remotely will, in some cases, enable a vessel to move from one client project to the next without having to return to harbour. Trident is using its experience and expertise to develop tools that not only improve navigational capability but also optimise offshore operations to the financial benefit of its clients.
DGPS for rig positioning

Typically, a full rig system will include a navigation computer; primary, secondary and tertiary DGPS systems; at least one gyrocompass; and dual radio telemetry systems for communicating with the tugs. Consistent with its policy of owning rather than hiring the components for its navigation packages (one of the reasons Trident is able to produce compact, single-box units), Trident has selected Veripos as its service provider for the DGPS.

Veripos’ Standard and Standard+ services offer positional accuracy to within 1 to 2 m, depending on the distance to the closest reference station and the number of visible satellites. These global reference stations are used to derive a differential correction for the GPS L1 C/A-Code observations for all the satellites in view at each reference station. These corrections are transmitted to the TriPAC (Trident positioning and control) unit and used to correct the on-screen image.

The Standard+ service uses dual-frequency GPS receivers to maintain positional accuracy during periods of heightened ionospheric activity. Changes in the ionosphere can affect the propagation of GPS signals. Increased ionospheric activity can introduce large biases into standard single-frequency DGPS because the slower signal rate results in the failure of the correction model used to predict the behaviour of the ionosphere. Dual-frequency GPS receivers calculate the true ionospheric delays at both the reference station sites and the user end to derive an “iono-free” DGPS solution.

Veripos’ Ultra service offers decimetre-level positional accuracy. It is typically switched on at the end of a rig move for final positioning, above a wellhead, for example. The service is based on precise-point positioning techniques in which a set of globally valid corrections for individual satellites is transmitted from the Jet Propulsion Laboratory in Houston, USA, directly to the TriPAC receiver. The presented position is therefore independent of the distance from the reference stations.
Driving safely

Deepwater pile installation from the back of a boat – a complete success

Late last year, the driven-pile anchors for Murphy Oil’s Kikeh spar, now stationed 120 km off the coast of eastern Malaysia, were installed by Technip using a MENCK underwater hammer. Actually, Technip’s choice of equipment was reasonably straightforward because no other company in the world can supply hammer systems for use at depths like those found in Kikeh field – in excess of 1300 m.

As far as pile installation was concerned, depth was not the biggest issue at Kikeh – the current depth record for driven piles is held by Kerr McGee’s Constitution spar at 1564 m. What made this project different was that, for the first time, the whole operation was performed from a relatively simple, DP Class 2 monohull vessel, the Rockwater II, rather than from a more normal Class 3 semisubmersible crane barge or similar large – and expensive – vessel.

Lutz Micheel, MENCK project manager, explains: “The main challenge we faced was shortage of space. The deck area on, for example, the Saipem 7000 is around 9000 m²; the deck on the Rockwater II is 1150 m² – and we were not allowed to monopolise it. We succeeded in getting the hammer and its underwater power pack, plus all our supporting equipment, into an area no greater than 400 m². However, the confined conditions on the deck of the Rockwater II meant we did not have the luxury of a back-up hammer on the project, and so mechanical reliability was paramount.”

The other challenge for the hammer’s eight-man support team was connected with the lifting equipment available on the boat: a 150-t crane with a 13-m radius of operation – and only 475 m of wire. “Again, this was inconvenient but not something we could not deal with,” says Micheel. “Our MHU 500T hammer with its MUP-01 power pack weighs only 107 t in air, and the way we have designed the hammer’s trunnions meant that upending the unit to get it over the side of the boat was reasonably easy. To overcome the shortage of wire on the crane, Technip lowered the hammer to working depth using extension pennants. It was subsequently kept there for the 10 days required to complete the project. The fact that the piles had been previously stabbed into the seabed, and so did not need to be lowered with the hammer, was obviously also a factor in our favour.”

Using the MENCK hammer, Technip installed ten 84-in- diameter mooring piles for the spar and four piles for a tender-assisted drilling unit, in four clusters roughly 3 km apart, in a total net driving time of just over 21 h.

“The project was a complete success from our standpoint,” says Micheel. “Most importantly, it was free of any safety or environmental incidents. It also proved that the hammer could be deployed from a less costly vessel, with generally better availability, than the large crane barges commonly used for this kind of work.”

MHU development

MENCK introduced its first MHU hydraulic hammers in 1980. The standard MHU hammer (designated the S series) was designed for use at the surface or in shallow water (down to 400 m). Models are currently available with energy ratings of between 150 and 3000 kJ.

"The project was a complete success from our standpoint. Most importantly, it was free of any safety or environmental incidents. It also proved that the hammer could be deployed from a less costly vessel, with generally better availability, than the large crane barges commonly used for this kind of work"
Upending the MHU 500T hammer and integrated MUP-01 power pack on the deck of the Rockwater II.
Despite their advanced engineering, MHU S series hammers are limited in terms of the water depths at which they can operate. As the hammer is taken deeper, a point is reached when powering it from a diesel hydraulic unit at the surface becomes hazardous and impractical. In addition, the increasing hydrostatic head against which the hammer has to operate progressively reduces performance.

The answer that MENCK came up with in the late 1980s was an electrically driven hydraulic power system (designated MUP) that could be taken to depth with the hammer. The MUP is designed to fit around the hammer like a girdle. It is connected to surface by a single umbilical cable delivering electric power, compressed air and communications. MUPs are available for use with uprated MHU T series hammers (suitable for use down to 2000 m) with energy levels between 135 and 900kJ.

MENCK is about to launch a U series of hammers that will be able to operate at depths as great as 3000 m. The existing MUP power pack is already rated for use at this depth.

Setting the pace – and the records

MENCK deepwater pile-driving hammers have been used by installation contractors on some of the industry’s defining projects over the past 10 years and have continually pushed the depth record for pile driving. So far, MHU hammers with MUP underwater power packs have contributed to 30 projects in water depths between 70 and 1564 m.

1998 Shell’s Ursa tension-leg platform (TLP), the largest TLP ever built, is held by 16 mooring piles in 1160 m of water. Each pile has a diameter of 96 in, is 135 m long and weighs 380 t.

1999 British-Borneo’s Allegheny ‘mini’ TLP is installed using driven piles (990 m).

2001 Kerr-McGee’s Boomvang and Nansen truss spars, the first structures of their kind, set the pile-driving depth record at 1186 m.

2002 Unocal’s West Seno A TLP (1025 m) becomes the first such platform to be installed in the Asia–Pacific region. A MENCK hammer is also used to install the 28 conductor piles on this project – the only deepwater conductor driving operations undertaken so far.

2003 Exxon’s Kizomba A TLP (1190 m) is the first TLP installed offshore West Africa.

2004 ConocoPhillips’s Magnolia TLP pushes the depth record to 1420 m.

2005 Kerr-McGee’s Constitution spar sets the current record of 1564 m.

2006 Murphy’s Kikeh spar (1350 m) becomes the first platform of this kind in the Asia–Pacific region.

(All projects in the Gulf of Mexico unless otherwise stated.)
Flexible solution

Taking subsea tree installation off the critical path

An advanced system designed to safely and economically lower subsea equipment continues to prove that complex installation procedures can be taken off the critical path and performed from small, easily available vessels instead of costly drilling rigs and construction vessels.

The compensated anchor-handler subsea installation method, or CASIM, was developed by deepwater mooring systems specialist InterMoor. It can be used to install equipment such as suction-embedded plate anchors, suction piles, subsea trees and manifolds.

Equipment such as suction piles can weigh anything up to 200 t, while subsea trees can typically weigh between 40 and 80 t (although InterMoor is also in discussions with clients regarding the deployment of trees that weigh around 110 t). To date, subsea trees sized up to 3 m × 3 m × 4.5 m (and weighing between 45 and 57 t) and suction piles up to 23.7 m long by 5.5 m diameter (and weighing up to 182 t dry weight and 152 t wet weight) have been successfully deployed using CASIM, in water depths between 450 and 1706 m.

By way of a specific example, it was CASIM’s flexibility that was key during a recent project for US-based Newfield Exploration Company, an independent oil and gas exploration and production company. In November 2006, Newfield was bringing a well into production in the Gulf of Mexico’s Mississippi Canyon and had already chartered a vessel to run the well’s umbilical. This provided an opportunity to transport the 57-t horizontal production tree to the location. However, although the Intrepid (a dynamically positioned crane barge) had a 400-t crane, it did not have any heave compensation to facilitate accurate placement of the tree on the seabed.

Brent Boyce, project manager, InterMoor, explains that InterMoor was able to lower the tree from the Intrepid using its crane by deploying the CASIM heave-compensation system. “We used CASIM to safely set the tree down on the wellhead. However, this was only to wet store it, and we did not lock the tree because the plugs still needed to be drilled out,” he says.

“When the rig arrived a month later, we went back with our compensation system,” Boyce continues. “We picked the tree up off the wellhead, suspended it from a winch off the side of a rig and then moved off location for 12 days while Newfield landed the blowout preventer stack, drilled those plugs out and ran a liner. Then we moved back over the wellhead and put the tree back. We then locked it and tested it, ready for Newfield to run the completion.”

Newfield has since commissioned InterMoor to install another similarly sized tree at its Fastball development, also in the Gulf of Mexico, this time using an anchor-handling boat.

Boyce comments that CASIM was key to the delivery of a highly cost-effective solution for both of these projects, as it enabled the work to be carried out offline using a vessel rather than online – and on the critical path – using a rig. “Conventionally, companies would use a rig for this kind of work,” he says. “But at Mississippi Canyon, they already had a vessel chartered. So basically we used about four and a half hours of vessel time – rather than two days of rig time.”

About CASIM

CASIM is an all-inclusive installation service package that covers detailed engineering work, dynamic lowering analysis, operational procedures, tools, equipment and offshore personnel.

The service includes a heave-compensation device: a single-unit cylinder that acts as a shock absorber. This reduces motion and line tension by acting as a soft, dampened spring applied in series with the much stiffer lowering system. The cylinder is charged with nitrogen gas to a specified pre-tension level before launch and is positioned in-line above the object to be lowered. As part of the CASIM process, the heave compensator is tuned to the object’s load and mass, the water depth, the sea conditions and the desired acceleration at depth.