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Momentum Revolutionizes Traditional Offshore Equipment Decisions by Thinking Smarter & Smaller

Buyers Guide Issue

Imaging, Survey, Mapping, Data Acquisition & Processing

Cover Story

Using New Technology for Platform Installation

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Equipment decisions in the offshore construction world are often influenced as much by tradition and experience as by capability. However, Momentum Engineering has often discovered that daring to be the first to trial emerging technology –when done carefully and with thorough testing – can lead to faster execution and higher profits. Our use of microROVs has proved rewarding on a recent construction project to place gas production tripods on the Black Sea.

Momentum Engineering is headquartered in Dubai, United Arab Emirates. We have been actively involved in Drilling, Engineering, Offshore Construction and Port Management services throughout most areas of the world for the past 22 years. We were awarded the contract to place tripods on several wells in a very short timeframe. These tripods, the smallest weighing over 450 tons, are being placed to extract gas from wells drilled earlier in 2006. There are three wellheads for most locations, and the tripods have to be carefully lowered onto the wellheads, in a complex process. This exact technique and process was new, and Momentum was not the first firm to be hired to manage it. Two earlier attempts by other firms had failed; the tripods toppled and were abandoned on the seafloor. Needless to say, we were under intense pressure and scrutiny as we placed each tripod.

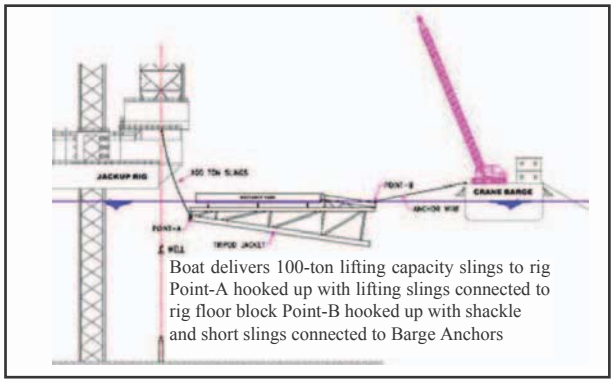
When investigating ROV resources to work with divers, cranes, rigs, hammers, and other tools needed for the system we put together, we considered both traditional ROVs and the new, tiny, inspection class ROVs that have become available in the last few years. Of these, the VideoRay is actually the smallest, though it is also the most popular and fastest. We could see three primary advantages of using VideoRays over larger, traditional observation class units:

- The smaller size and power consumption meant they were far easier to transport, deploy, and share as needed between different locations or different vessels or rigs on the same location.
- The smaller size of the VideoRay meant that they could go places that larger vehicles would not be able to penetrate. The high thrust-to-weight ratio of the latest VideoRays meant that we would not have to sacrifice range or tether-pulling capabilities to achieve this in the depths and conditions we expected to encounter.
- The lower cost and (again) small size of the units allowed us to consider them to be "disposable" when absolutely necessary. If operations demanded that the ROV be put into high-risk situations we could push forward with relatively few hesitations since we could get a replacement to the site easily. This has been important more than once.

Our initial tests with VideoRays equipped with the GTO thrusters, done in conjunction with VideoRay's representative in the UAE – Emirates Aviation – were successful. We purchased two VideoRay Deep Blue units, along with laptop computers, Desert Star pilot positioning systems, Tritech Sea Sprite sonars, spare parts, and three days of training.

The three days of training turned into three long days of unpacking systems, testing and explaining, and getting systems unstuck from under the pier at Izmit, where the tripods were being built. My primary operator, Pavel B. and I had a chance to get some operational experience and learn from the VideoRay instructors. We discovered that three days was not enough time to learn the system and develop the skills and experience necessary to operate in the demanding conditions offshore. We needed more time if we were going to get our VideoRays where they needed to be, operate the software for the sonar, positioning system, and video/stills capture, and – most important, get the VideoRay back after each dive.

From the beginning, we planned to use the VideoRay along with surface-supplied divers to accomplish our mission. We use it to help guide the tripod to the bottom, but we also support divers, check valves, confirm which tools are needed before divers go down, record pre- and post-surveys of the area and work which was done. This protects Momentum as well as the divers, and enhances safety, a cornerstone of Momentum's mission statement – "Our Mission is to continue exceeding our customers' expectations by applying the latest in technology while adhering to the highest quality and safety standards in the industry."



Boat delivers 100-ton lifting capacity slings to rig Point-A hooked up with lifting slings connected to rig floor block Point-B hooked up with shackle and short slings connected to Barge Anchors

Schematic of the operation.

Since we were unsure of our ability to adequately operate the VideoRay in these harsh and demanding conditions on our very first tripod, we decided to hire an expert to help us with the first platform placement. We were fortunate to get Mr. Steve Van Meter to do this, and he worked for us for a few weeks before he had to return to the United States.

The plan was to tow the platform to location behind a tug, with a crane barge accompanying. We would meet the jack-up rig on site, and use both the rig and the barge to set the tripod over the wellheads.

After the tripod was towed to the site, a pre-installation survey of the structure was required to check the buoyancy tanks, slings, shackles, valves and other items essential to the installation operation. A VideoRay was used to inspect the structure and in this case the portability and low power requirements turned out to be exactly what we needed. The unit was ferried onto the tripod on a zodiac and was

The first gas production tripod is being prepared to move to the job site.

operated from a corner on top of a large coil of rope. It was powered by two batteries and a tiny inverter that VideoRay supplied with the system. It certainly was one of very few ROVs which could be easily carried while walking on the steel tubes of the tripod.

During work on the jack-up rig we lost a Deep Blue GTO submersible. One of the newer operators allowed too much tether to float on the surface as a tug boat was moving. The problem was noticed, but too late – before the tether could be retrieved, it caught in a prop and the prop wound the tether until the submersible was smashed into small pieces – and completely destroyed.

By this time Mr. Van Meter had been working with us through the load out operations and transportation operations, and had been training our pilots on a daily basis. Unfortunately we were not able to keep him on site until we were ready to place this tripod. However, we were able to get help from another expert VideoRay owner/operator from Istanbul – Mr. Selcuk Kolay. The installation was scheduled to proceed within a few days so we brought Mr. Selcuk out to the site and almost immediately after he arrived we were able to use the VideoRay to lower the platform over the wells, in a process that involved over four hours of non-stop VideoRay operation.

Prior the installation of the tripod, a visual survey of the seabed surrounding the jacket installation location had to be carried out by the VideoRay from the KANTA barge.

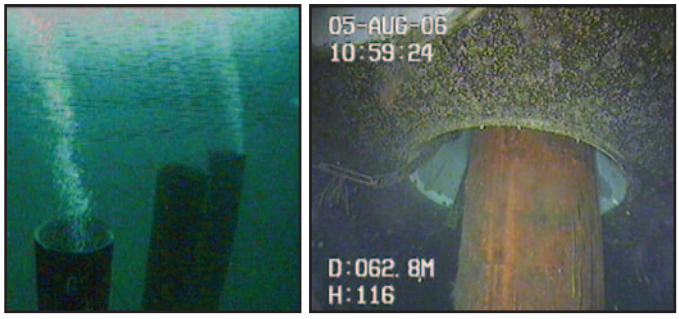
We first carried out a survey of the area of 50 meters in diameter centered about the base of the tripod to identify any potential debris and general obstructions. A detailed survey of the area where the mud mat would settle was completed. Any debris which would interfere with the installation of the jacket over the well casings was removed.

The submersible is launched and ready to dive.

The jacket had to be installed over three existing sub sea wells. The sub sea conductors have been cut off with a casing cutter at between 3 and 4 meters above the seafloor.

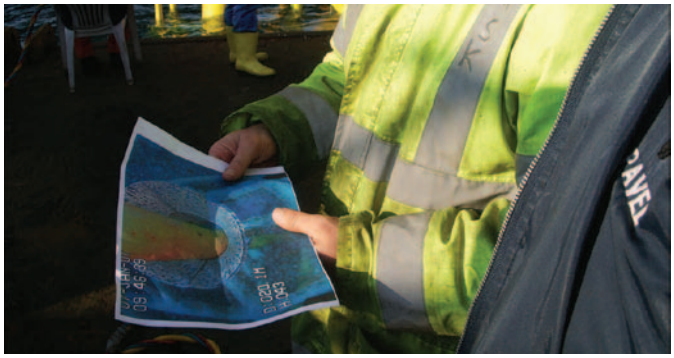
To locate the jacket over the wells precise control was required, and was accomplished with the help of the VideoRay. The bell mouths on the lower framing of the jacket were painted white for ease of identification.

For the installation process the floating AKKAYA jacket was positioned on location, and the legs and buoyancy tanks were slowly flooded. Then the jacket was up-ended by raising the lifting sling attached to the drilling rig's traveling block. After the up-ending was completed the jacket was very slowly lowered on to the conductors. Before the jacket reached the conductors, we launched the ROV to assist with the final process by monitoring the alignment of the 3 conductors with the 3 bell mouths on the lower framing of the jacket. To achieve this, the ROV had to remain on location at the bottom next to the conductors until the conductors had been stabbed by the jacket. This was another phase of the operation where the small size, power and the relative "expendability" of the Video Ray played an important role. When the jacket had been lowered over the conductors the ROV had to stay under the jacket until it was obvious that the jacket had been lowered far enough not to



VideoRay Screen Captures: VideoRay image of Conductors ready for fitting (left). Conductors are fitted into bell mouth of the tripod while being observed by the ROV pilot (right).

come off again or damage the conductors in anyway. That meant that the ROV would only have about 1-1.5 meters of clearance between the seabed and the bottom of the jacket before it could leave its position. Fortunately, the stabbing was clearly successful early enough in the lowering process to halt the jackets descent for a few moments while the VideoRay powered out from underneath.



Operators pass around a print-out of a VideoRay screen capture to keep operators, divers and project management on the same page.

The anchor lines connected to the barge were used as appropriate to position and control the jacket during the lowering sequence.

After the first tripod, the second and third are each a bit bigger and longer. The second tripod was set in December, and we expect to finish the third soon.

In conclusion, we have found the VideoRay ROV quite successful in handling observation and guiding tasks on this project, both with divers and operating solo. We feel that VideoRays have significant advantages in cost, speed, and efficiency when compared to larger ROVs for offshore work. www.videoray.com has a wealth of information on the ROV and how it is used.