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PLUS: HOW SHRINK-FIT FLANGES WILL HELP VENTURE DRILLING RISER HANDLE THE PRESSURE



Sizing up tree planting

At its inception in the mid-1990s, a heave compensated support system for positioning subsea work packages was intended for inspection, repair and maintenance work with loads of 10,000lbs. A dozen years on, it has evolved into the Heave-Compensated Landing System that Delmar has used to install over 130 subsea trees, some of which tip the scales at 130,000lbs.

Jennifer Pallanich reports.

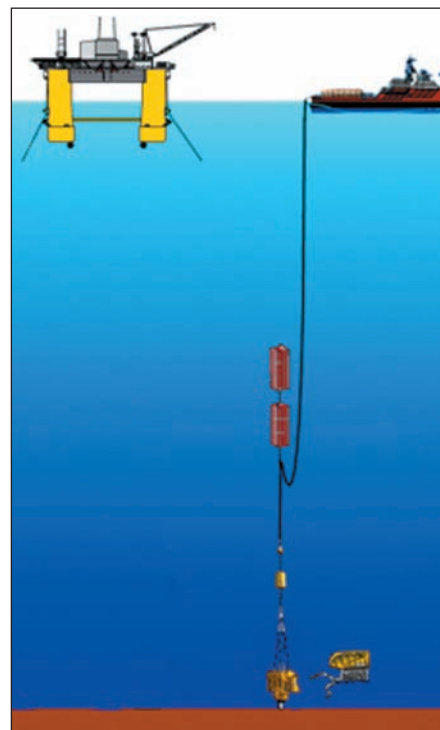
At its heart, the HCLS is mooring equipment: in short, a syntactic foam buoyancy module floating below the surface that suspends the equipment to be installed, and the buoy's other end is connected by catenary wire and chain to the anchor-handling vessel. Paying out wire and chain from the AHV – with its winches, chain lockers and related equipment – controls the equipment's descent to the seabed. As chain is let out overboard, its weight slowly overcomes the buoyant force of the foam module, allowing the controlled

placement of the equipment on the seabed.

'It's a very simple system, but it's extremely effective,' says James Soliah, subsea manager at Delmar. 'It's automatic. It doesn't have a choice . . . Gravity and buoyancy work every time.'

Over time, Delmar has refined the deck process and the handling equipment onboard the AHVs, he notes, but the method itself has changed very little.

'It's essentially the same as it was way back when,' he says. One change has been to capacity. Originally intended for IRM





work, it was designed for loads of 5000-10,000lbs. The trees destined for Na Kika weighed in at a hefty 90,000lbs. A Mariner Energy tree installation topped the charts at 130,000lb, and Delmar installed that in March 2007. Earlier this year, Delmar was working on the engineering for a pair of 160,000lb trees, and Soliah says the system could feasibly install structures up to 400,000lb, but only with the buoyancy system, chains and wires to match. He says the system can also switch gears, nearly on a dime: it can install a 100,000lb tree and pick up a 20,000lb running tool in one run.

'We can mix and match on the fly,' he says. 'That's how it evolved. We had the equipment. We had the work. We had access to the boats. It just kind of all fell together.'

Tree count

To date, Delmar has used it to install over 130 subsea trees. The company is just finishing up a four-year program installing 39 trees for ExxonMobil's Kizomba development offshore Angola and has the Shell contract to install trees and tubing heads at the BC-10 field off Brazil as well as trees, tubing heads and

subsea separator equipment at Shell's Perdido field in the Gulf.

The shallowest work Delmar has done with the system is in 1900ft, Soliah says, but the system can work in as little water as 1200ft.

The shallow water work is challenging. Soliah says, 'The only way to do less than 1900ft of water is you have to use in line weights or significantly larger chain.' This brings up the added risk for personnel and equipment handling on deck, he says. The cost savings may make the work worth doing in shallow water, 'But it's not nearly the level of deepwater,' Soliah says.

Delmar is using the system to install trees, jumpers, tubing heads, manifolds and control pods in addition to occasional emergency IRM jobs. The Louisiana-based company has two systems dedicated for work in the Gulf of Mexico as well as an HCLS in Brazil and the unit that is finishing the Kizomba installations.

A few years ago, a couple of operators indicated they had saved about \$1 million per tree installation using the heave-compensated system. The savings come through installation off rig critical path

and through using a less costly vessel for the work.

System beginnings

Shell and JIP partners BHP, BP, Exxon and Kerr-McGee developed the system based on work on a 1996 JIP originally intended for IRM work.

'The system worked great once it was in the water,' Soliah says. 'Getting it in the water was a nightmare.' That the system debuted on an ROV vessel, he notes, contributed to the difficulties in putting it in the water. Shortly after that, the petroleum industry hit a downturn; people forgot about the system.

A few years later, Shell wanted to install trees and tubing heads at its Na Kika field in 7000ft of water in the Mississippi Canyon area of the Gulf of Mexico without using a costly rig. Delmar had independently worked on a system similar to the JIP's system and used it to install a mooring connection. During a patent search, Delmar learned of the JIP's efforts, for which Shell holds the patent, Soliah says. Delmar worked with Shell to implement the system for the work at Na Kika and also negotiated for the rights to the system. Now, Delmar can offer any operator access to the system, but any company not part of the JIP must pay royalty rights to Shell. Soliah says Delmar has provided the system to nearly every major operator in the Gulf.

'It's a recovery tool as well,' Soliah says, adding Delmar has performed nearly 25 equipment recovery jobs.

Delmar is considering expanding its HCLS work to the realm of pipeline pull-ins, but, he says, 'You need the right project for it.' **OE**

