



Once raised clear of the jacket, deck could be moved away and made ready for tow. (Pictures from Twachtman, Snyder & Byrd.)

## Giant scissors jack detaches Gulf deck

*After last month's demonstration of a new method of topsides salvage, Adrian Cottrill reports on a method which challenges existing approaches to handling heavy loads offshore.*

A novel spread of offshore equipment has just completed its first full-scale offshore application for deck salvage in the US Gulf of Mexico. In a satisfyingly quick and simple fair-weather exercise, the topside of an expired Amoco platform has been lifted gently from its supporting jacket and brought inshore as a single unit using the Versatruss approach.

Weighing close to 1200t, the deck belonged to Amoco's eight-pile 'A' production platform standing in 105m of water on Eugene Island block 367, some 130 km off the coast of Louisiana.

Promoted by US company Versatruss, the lift technique is based on an array of common offshore industry equipment, all of which can be picked up off the shelf or quickly fabricated. Two barges and an array of booms, rigging and winches are assembled together to produce what is essentially a giant scissors jack.

The method had already been applied in summer last year in a 'full-scale model test' at a much smaller inshore structure

owned by Mobil. This year, with the Versatruss company prepared to cover a significant part of operational costs in its bid to establish the technique, Amoco decided to adopt the method for a full offshore decommissioning application on the EI 367A platform.

The oil company appointed Houston consultants Twachtman Snyder & Byrd (TSB) to act as its project management contractor for the job, and placed a separate contract with Versatruss to execute the lift.

Describing the system, Versatruss director Bill Cash says: 'What we do is flank the platform with two symmetrically-placed barges which each support a line of custom made booms. Once the top ends of those booms have been located in receptacles welded to the deck, we pull the barges together sideways with winches. This causes the angle of inclination of the booms to increase, and so the deck is forced upwards.'

As part of the preparations for the deck lift, TSB commissioned preparatory work

on the platform, while Houston consultants Han-Padron carried out independent checks for the system's structural integrity for Amoco.

The upper tip of each boom inserts into a prefabricated receptacle installed at the top of the deck leg stubs. These 'receiving hooks' are welded onto the legs just underneath the cellar deck and are designed to rotate freely as the boom angle changes.

As well as organizing attachment of these hooks, TSB also supervised the cutting of the eight jacket legs at a point 3m above sea level, leaving temporary holding restraints. And tension beams were installed to span between the lower ends of the deck legs to ensure that they would not be pulled apart during winching operations.

With everything ready, the deck was lifted off its supporting jacket in a twelve-hour operation on 30 August. By the next day the resulting 'catamaran' had reached shore at the Ocean Marine yard, in the

# DECOMMISSIONING



*Rigged together in what is a very stable catamaran configuration, the deck/barges combination headed for shore at a speed of 10 knots.*

Morgan City area, after completing the 110 nautical mile tow at up to 10 knots.

Actual weight of the deck, at 1180t, turned out to be some 22% heavier than the predicted 970t, and its centre of gravity was not entirely where expected. This resulted in rather more of a struggle than expected for the 50t capacity Skagit mechanical winches hired as muscle for the job, although they managed in the end.

Bill Cash is already speaking of hydraulic power as an improvement in this area.

With the right power train, he remains confident that Versatruss is capable of lifting off or installing decks weighing 20,000t or more. Because of the mechanical advantage of the rigging system, a 9000t deck, for example, can be lifted by 3000t of pulling power in the lift system.

And he emphasizes that no anchoring system is necessary for this technique. 'We didn't need to moor up at all at the Amoco platform—it was a hit and run operation,' he says. The full-scale test on Mobil's shallow-water platform last year had already established that tugs were easily able to manoeuvre the lift barges and keep them on station, and this approach saves

considerable time compared with installing and retrieving a mooring system. That was again demonstrated in this year's far larger exercise.

Among other advantages claimed for the technique are its ability to go ahead in very shallow water, its relatively low cost of mobilization and the fact that there is no need for major modifications to the deck or jacket being lifted.

Installation of complete decks has so far required either use of a large crane vessel, or, in areas where the environment is benign enough, floating them over their pre-installed support structures. Both these methods need to be anticipated at the design stage. In addition, only a few barges worldwide are capable of lifting the weight of a substantial modern topsides.

Last year's 'full-scale model test' of the Versatruss technique was carried out in June, when Mobil commissioned the method to salvage the 225t deck of its West Cameron block 71 well protector platform. Installed in the early 1970s, this four-pile structure stood in just 12 m of water.

'Budget restrictions prevented the offshore instrumentation originally planned, although the salvage was



*TOP: Leeward barge moves in first, preparing to align its booms with 'hooks' on deck.*

*ABOVE: The two 55m long Versatruss lift barge were each kitted out with four custom-made booms. Base of each boom is secured to the lift barge centreline using a spreader beam.*

*LEFT: Each truss is in fact an A-frame whose tip stabs into a receptacle welded to platform. A boom diameter of 1.5m is reckoned good for lifting around 15,000t.*

*INSET LEFT: As the two barges are pulled together by rigging arrangement (which includes tension bar across bottom of deck legs), so the whole array is forced upwards.*

# DECOMMISSIONING

successfully conducted,' noted Barbara Thompson of consultant Barnett & Casbarian (which carried out pre-salvage analysis for Mobil) in a paper at OTC this year. 'The WC71 deck was salvaged with no apparent damage to the deck structure, and with stabbing performed quickly and without any difficulty,' she said in summary. 'In seastate conditions which increased to waves of close to 1m significant height, observed response of the lifted system was minimal.'

For this year's operation, Versatruss mobilized two 55m long barges from Belle Chasse, Louisiana, using two tugs. Once the tugs had positioned those barges on either side of Amoco's platform, the process of mooring them to the jacket and rigging up could begin.

Next, with the tugs maintaining tension in the mooring lines to the jacket, each barge in turn was winched in until the tips of its booms mated with the receiving hooks. Main lifting could then go ahead, synchronizing boom angles and winching loads as the deck was raised. With the two barges and deck now forming a 'catamaran' the whole array was then towed to shore, where the deck could be lowered on to a transport barge and weighed.

At one point there had been talk of also using the Versatruss principle to lift off the top 30m of the jacket. Estimated to weigh 725t, that section might have been raised from the lower jacket and set down on the seabed alongside the remaining stump using the stripped down deck as lifting frame.

However, the plan eventually adopted was to topple the upper portion of the jacket at location. TSB is about to go ahead with that operation, leaving the structure as part of the Louisiana artificial reef programme.

Meanwhile, Versatruss is pursuing further deck decommissioning possibilities, from California to the North Sea, and for weights of 20,000t or more.

For his part, TSB's Bob Byrd, who has been active in planning a number of large platform removals, notes that 'with some further development this may well be the wave of the future for platform decommissioning.'

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