"The Claw" can grab an entire oil rig, lif it from the bottom of the sea and set it on a barge.

Alle Bilder: Versabar

Claws of Steel

Wirbelstürme wie Katrina haben im Golf von Mexiko zahlreiche Ölbohrplattformen versenkt. Deren Bergung war bisher ein riskantes und teures Geschäft. Ein gigantischer schwimmender Greifkran erleichtert nun die Arbeiten, da er die Pattformen als Ganzes packen und auf einen Ponton setzen kann.

Hurricanes like Katrina have sent many** oil rigs **to the bottom of the Gulf of Mexico.** Salvaging **the** submerged **platforms used to be a risky and expensive business – until the** "Claw" **came along. The giant swimming** clamshell **crane just picks up the rigs in one piece and lifts them onto a pontoon.

The *flurry* of hurricane activity off the Texas and Louisiana coasts in the last decade has created complex challenges for the offshore salvage industry in the Gulf of Mexico. From 2004 to 2008, five major hurricanes (Ivan, Katrina, Rita, Gustav, and Ike) left hundreds of oil rigs and other offshore structures either damaged or destroyed, *elevating* the *demand* for removal. Salvage operations of *toppled* platforms typically required extensive diver *involvement*, numerous subsea cuts, and many separate lifts to the surface to remove the *wreckage* piece by piece.

In 2007, Versabar provided a breakthrough in offshore salvage operations with the development of a new catamaran lifting technology, named the "Bottom Feeder." The dual *barge*-mounted *truss* system's ability to perform single-piece *topside retrievals* provided a safe and efficient alternative to time-consuming and *hazardous piecemeal* recovery.

With the Bottom Feeder's initial success and a large stream of hurricane-related cleanup remaining in the Gulf, the demand for a second system became *apparent*. Versabar decided to build a larger system that could not only handle heavier lifts of toppled platforms, but could also perform above-water *decommissioning* of damaged or *abandoned* platforms as well. The VB 10,000 was completed in a 12-month span and launched in October 2010 as the largest lift *vessel* built in the United States.

Lifting Sunken Oil Rigs

After *retrieving* dozens of sunken platforms with the Bottom Feeder and VB 10,000 lift systems, Versabar engineers found themselves with a new set of challenges. In a number of cases, the sunken topsides were too *fragile* to remain intact during the lift to the surface. Versabar engineers designed and fabricated large steel "baskets" with multiple lift points to assist in these lifts. Lowered to the sea floor *adjacent to* the damaged structures, these baskets would then provide a stable base to enable the damaged topside to be retrieved intact.

As subsea work *progressed*, Versabar continued to search for more efficient, safer recovery methods that would minimize diver involvement in subsea operations. Diving is *inherently* dangerous under normal conditions. Sending divers to the sea floor to attach *hooks* to unstable structures in a *debris* field with *swirling currents* and poor visibility *exposes* divers to significantly greater risks. Challenged to *remedy* the situation, Versabar President Jon Khachaturian came up with a solution that would require minimal subsea preparation in topside retrievals: a new lift *device* that would eliminate the need for using hooks as lift points. Named "The Claw," the new device would *scoop* up the sunken topsides from the sea floor, and *deposit* them on baskets to be retrieved using the VB 10,000 lift system.

The Claw project began in December 2010 with a series of rough *sketches* as Khachaturian communicated his concept to his team of engineers and *draftsmen*. The draftsmen then went to work to produce a series of drawings that would *evolve* into the final documents that *fabricators* would use for construction. Fabrication began in March as *welders* began cutting and fabricating the primary elements of the Claw structure at Gulf Marine Fabricators in Aransas Pass, Texas. By April, ➔

abandon, to	*verlassen, aufgeben*
adjacent to • ə**dschäiß**nt	*neben, angrenzend*
apparent	*offensichtlich, ersichtlich*
barge • bahdsch	*Lastkahn, Schute*
clamshell	*hier: (Bagger-) Greifer*
claw	*Klaue, Kralle*
current	*Strömung, Strom*
debris • **deb**rih	*Trümmer, Schutt*
decommissioning	*Stilllegung*
demand	*Nachfrage, Bedarf*
deposit, to • di**poß**it	*absetzen, deponieren*
device	*Gerät, Apparat*
draftsman	*technischer Zeichner*
elevate, to	*erhöhen*
evolve, to	*sich entwickeln*
expose, to	*aussetzen*
fabricator	*Hersteller, Baufirma*
flurry	*Vielzahl, hektische Aktivitäten*
fragile • **fräd**scheil	*zerbrechlich, brüchig*
hazardous • **häß**ədəß	*gefährlich, riskant*
hook	*Haken*
inherently	*grundsätzlich, v. Natur aus*
involvement	*Beteiligung, Einmischung*
oil rig	*Bohrinsel, Ölplattform*
piecemeal	*Stück für Stück, stückweise*
progress, to • **prou**greß	*fortschreiten, weitergehen*
remedy, to	*beheben*
retrieval • ri**trih**vl	*Bergung, Rettung*
retrieve, to	*bergen*
salvage, to • **ßäl**vidsch	*bergen, retten*
scoop, to	*schaufeln, schöpfen*
sketch	*Entwurf, Skizze*
submerged • səb**möd**scht	*unter Wasser*
swirl, to	*wirbeln, strudeln*
topple, to	*kippen, umstürzen*
topside	*Plattform (Teil der Bohrinsel über Wasser)*
truss • traß	*Fachwerkträger*
vessel	*Schiff, Fahrzeug*
welder	*Schweißer*
wreckage • **rek**idsch	*Wrack*

www.vbar.com
Auf der Webseite von Versabar finden sich zahlreiche Bilder, Videos und Informationen zu den im Artikel vorgestellten Bergesystemen.

The size of the clamshell gripper is enormous: It has a height of 37 meters, a width of 34 meters and weights 1000 tons.

In contrast to the old recovery method via hooks and steel trusses "the Claw" can even lift fragile and heavily damaged structures.

assembly had begun and the large structures began to take shape as the *pipe* sections were *joined*.

Meanwhile, four identical baskets to be used *in conjunction with* the device were engineered and fabricated. The baskets, each with a *support capacity* of 1,250 tons, were designed with built-in outward-facing hooks, in order to be lifted from underneath by a steel pipe. The new design would allow for a more efficient recovery procedure and gave the baskets the flexibility of being lifted either by the Claw, or a customized *rigging* solution.

By August, the two identical Claw assemblies were ready to be installed on the VB 10,000 lift system and undergo testing prior to *deployment*.

Gentler with a Giant Claw

The Claw design consists of two identical *grappling* devices *suspended* from each of the *gantries* of the VB 10,000. Each Claw assembly operates independently from the other, but they can be used *in tandem* for a double Claw lift. Each Claw is made up of two halves, joined at the top by a *pin* connection to a *girder*. Each Claw girder is attached to the VB 10,000 by two 9-part *slings*. This sling connection allows the Claw to easily attach to the VB 10,000, and *detach* for lift operations when it is not used.

The main *hoist* blocks of the VB 10,000 lift system control the raising and lowering movement of the Claw assembly. A second set of blocks, operated by 100-ton hydraulic *winches*, control the opening movement. These blocks are connected to each Claw half by using a long-*throat pelican hook* and a 3-part sling. The pelican hook can easily attach to the sling, eliminating the need for manpower in assembling the rigging. When each Claw block is raised, the Claw half rotates on the pin at the girder, resulting in the opening of the Claw. When the block is lowered, gravity pulls the *jaws* of the Claw back to a closed position. As a backup to real-time *survey*, an angle indicator located on the girder allows an *ROV* to determine the exact position of the Claw when it is underwater.

The jaws of each Claw assembly have eight steel *tines* weighing 11 tons apiece. The tines are connected in an *offset fashion*, allowing them to *interlock* when the Claw is in the closed position. When retrieving a topside from the sea floor, the blocks open each Claw half, allowing the tines to be positioned

around the sunken topside. The tension in the blocks is then released, the Claw moves back to a closed position, and the topside is retrieved in a scooping motion in the process. Depending on the structure, the tines are either inserted into the topside or interlock beneath it, securing it for lifting. The system's main hoist blocks then raise the Claw assembly as it *clutches* the topside, either bringing it all the way to the surface, or depositing it on a basket that has previously been lowered to the sea floor to serve as a support base during the lift to the surface.

Picking up Platforms One by One

In a four-day span in September 2011, the VB 10,000 used the Claw to retrieve five sunken topsides from the Gulf of Mexico. One gantry was used to perform the underwater lift of each topside with the Claw, while the other gantry of the VB 10,000 used a *counterweighted* lift *bar* rigging setup to lift each basket, resulting in the quick, efficient recovery of approximately 3,500 tons of hurricane debris.

In 2012 the Claw performed 17 lift operations, removing over 7,500 tons of debris from the Gulf of Mexico, including a 2,000-ton topside recovered from over 100 meters beneath the surface. The Claw also performed its first above-water operation: the decommissioning of a 900-ton standing platform. In its first year of operation, the Claw has proven to be a *versatile* tool that can *accommodate* a wide variety of offshore lift packages. ■ *Cassie Schott*

accommodate, to	*sich anpassen*
assembly	*Montage, Zusammenbau*
bar	*Balken, Riegel, Stange*
clutch, to • klatsch	*umklammern, packen*
counterweight, to	*ausgleichen (mit Gegengewicht)*
deployment	*Einsatz*
detach, to	*lösen, abtrennen*
fashion	*hier: Art und Weise*
*gantry • **gän**tri*	*Portal, (Kran-) Gerüst*
*girder • **gö**də*	*Träger, Balken*
*grapple, to • **gräp**l*	*packen, ergreifen*
*gross tonnage • grouß **tan**idsch*	*Bruttoregistertonnage*
hoist • hoißt	*Hebezug, Winde*
in conjunction with	*in Verbindung mit*
in tandem	*hintereinander, zusammen*
interlock, to	*ineinandergreifen*
jaw	*Backe, Klaue*
join, to	*verbinden*
meanwhile	*währenddessen, derweilen*
offset	*versetzt*
pelican hook	*Sliphaken*
pin	*Stift, Bolzen*
pipe	*Rohr*
rigging	*Aufbau, Aufrüsten*
ROV (remote operating vehicle)	*ferngesteuertes Fahrzeug*
sling	*Schlinge, Schlaufe*
support capacity	*Tragkraft*
survey	*Vermessung, Überwachung*
suspend, to	*aufhängen*
throat	*Kehle*
tine • tein	*Zinke, Zacke*
total beam	*gesamte Breite*
*versatile • **vöß**əteil*	*vielseitig, wandlungsfähig*
winch	*Seilwinde, Haspel*

The Claw Data Sheet

Claw assembly

Height:	37 m
Width:	34 m
Weight:	1,000 tons
Main Hoist Winches:	400-ton hydraulic (control raising and lowering)

Vessel

Structural Type:	Catamaran
Overall Length:	88 m
Total Beam:	96 m
Gross Tonnage:	10,116 LT
Maximum Heavy Lift:	7,500 tons

Compared to the mighty tubes of the steel trusses the pins holding the clamshell seem almost fragile.