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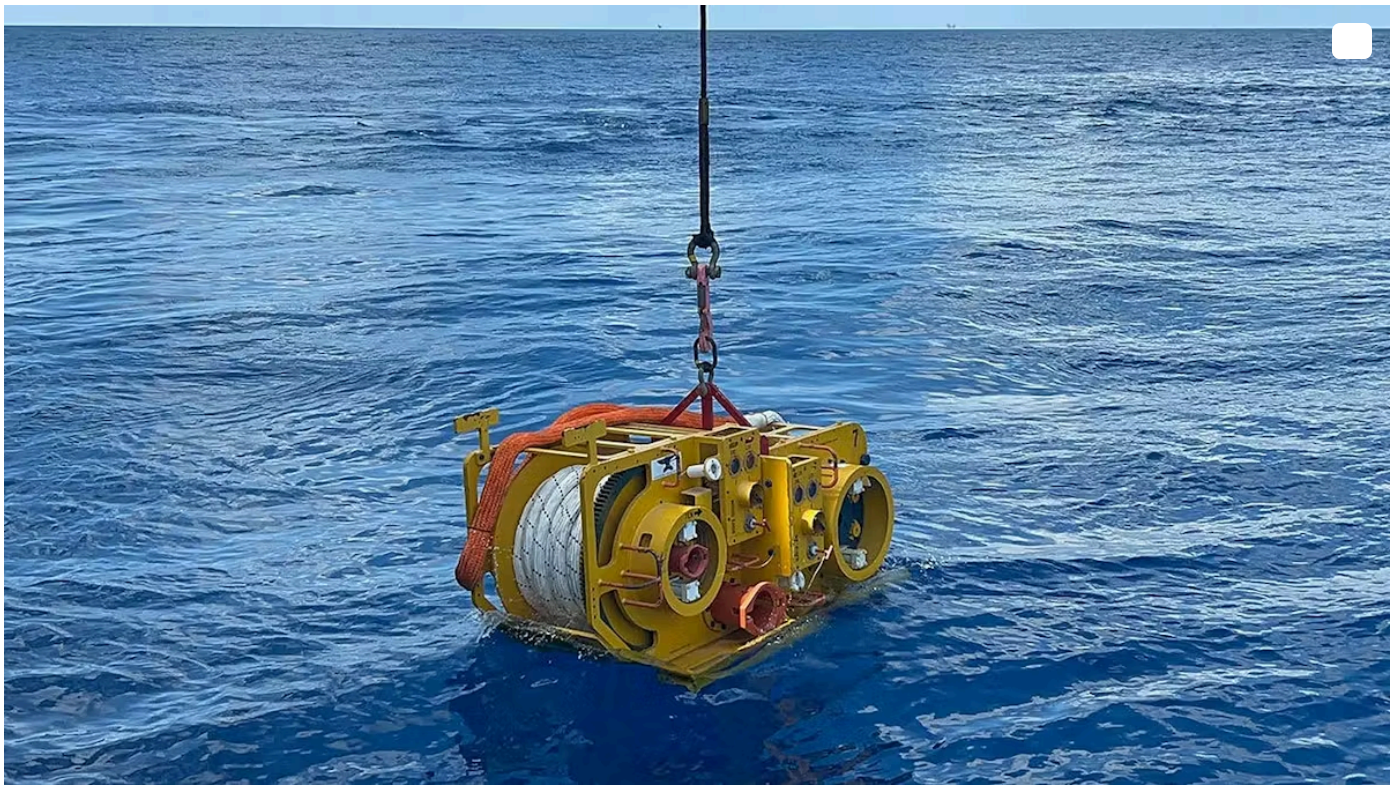

The Hercules high-strength tethered BOP system shifts the well/riser weak point into the riser system above the BOP, protecting the well system below the mudline from overloading in the event of a DP drift-off.

VESSELS

Tethered BOP allows drillship to work in shallow water

A case study in the Gulf of Mexico demonstrates how high-strength tethered BOP systems, combined with precise anchor placement and remote-operated vehicle assistance, enhance well integrity and operational safety during complex offshore interventions.

Kevin Chell Related To: Trendsetter Vulcan Offshore Inc. April 20, 2026 3 min read

Key highlights:

- The Hercules BOP system is designed to increase strength and stiffness, protecting well components during vessel drift-offs.
- The tethering technology reduces bending loads on critical wellhead components, enabling safe DP vessel operations in shallow water.
- Implementation in the Gulf of Mexico demonstrated significant improvements in safety margins and operational efficiency for aging well interventions.

By Kevin Chell, Trendsetter Vulcan Offshore Inc.

Plugging and abandonment and interventions for aging wells in shallow water often present technical challenges with wellhead strength because modern, heavy blowout preventers (BOPs) have been deployed for safety reasons on older wells, which have less strength than is typical in modern well construction.

A further challenge is that the moored rigs that were used to drill these legacy wells are not commonly available in these areas. So, dynamically positioned (DP) vessels often must be used.

What is a dynamic positioning (DP) system?

This article explains the fundamentals of dynamic positioning (DP) systems, highlighting their components, operation and significance in offshore drilling and subsea construction...

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Historically, DP units have not been permitted to carry out these functions in shallow water because the critical well components can be overloaded very quickly, leaving insufficient time to activate the emergency disconnect system. Today, advanced tethering technology greatly reduces the consequent bending to the critical well components and provides a means of safely operating DP drilling units in shallow water.

TVO's Hercules high-strength BOP system is designed to resolve these concerns by delivering sufficient strength and stiffness to resist loads caused by rig movement. By shifting the weak point to the riser system above the BOP, the system protects the well system below the mudline from overloading in the event of a drift-off, ensuring the BOP is never unstable and that the capacities of the wellhead and casings are never exceeded. The system functions even if the lower marine riser package (LMRP) fails to disconnect.

Once the components of the system are connected, the system is passive. If a drift-off occurs, any load increase transfers to the tensioners and suction piles, which hold the BOP in position and ensure well integrity is not compromised.

Case study

An international operator recently applied this technology in the Gulf of Mexico (GoM) for a well intervention program for four exploration wells that were drilled in the 1990s.

Before work began on the site, riser analysis was performed to prove the concept, and BOP drill-through engineering analysis was carried out to prove the rig could support the system.

A geotechnical study also was done to assess the suction pile anchoring system's capacity to hold the floater in place.

Modeled results showed that an untethered system reached a weak point at a vessel offset of 28.1 ft (8.5 m) in only 83 seconds. With the tethered BOP (TBOP) system installed, it took 171 seconds to reach a weak point at an offset of 114 ft (35 m). These results gave the operator confidence that the high-strength tethering system would protect the well as designed.

The next step was to ensure the appropriate equipment could be secured and develop well-specific operating guidelines to define safe operating limits for the DP drillship that would carry out the work.

The system installed comprised four dyneema tethering systems designed for an operational load of 200 metric tons with a 300-metric-ton survival load anchored to the seabed by 9.5-ft suction piles fitted with 4-ft wings to increase their lateral loading capacity. Because the shallow-water area of the GoM where these wells are located is a major pipeline corridor, anchor placement had to be extremely precise to provide the required support while avoiding existing infrastructure.

A multiservice vessel placed the suction piles in predetermined locations on the seabed using a subsea crane, and a work class remotely operated vehicle (ROV) connected the tensioners to the suction piles, then pulled the tethering lines from each tensioner to the BOP. With the lines from the tensioners attached to the BOP, the ROV tightened the tethers to secure the system on the wellhead.

The TBOP system reduced the riser angle forces transmitted to the LMRP and decreased shut-in and disconnect time to allow the workovers to be carried out safely from the DP vessel.

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