

Well control systems evolve for high pressure exploration

Marine Well Containment Company tailors capping stack technology to Gulf of Mexico's HPHT frontier

By [Jennifer Lynn Presley](#) in Houston



Ready position: capping stacks are maintained and stored at the Marine Well Containment Company's shore base in Ingleside, Texas Photo: JENNIFER PRESLEY/UPSTREAM

As the US oil and gas industry moves into high-pressure and high-temperature (HPHT) Gulf of Mexico fields such as Anchor, North Platte and Shenandoah, technologies that can respond to an emergency well-control event in those fields also are evolving.

The Marine Well Containment Company (MWCC), with its 20,000-psi rated capping stack, is one example of how industry is proactively responding to meet the need should an emergency arise.

MWCC was established as an independent company in 2010 — following the deadly Macondo blowout and oil spill — with the mission to create a response system for deep-water well events in the US Gulf.

The system is designed to shut off flow from a well using a capping stack. The company has five capping stacks capable of handling pressures of 10,000 to 20,000 psi and temperatures up to 400 degrees Fahrenheit (204 degrees Celsius).

Three of the five stacks use blind rams to mechanically shut in the well. Two stacks — one for extreme pressure and one for high temperature — use valves rather than rams to shut-in the well.

“We worked with Shell on the development of the 20k capping stack. The American Petroleum Institute provided all the guidance necessary when designing the capping stacks to make sure the specs are in line with the requirements,” said Matt Goldsmith, general manager of engineering for MWCC.

“The material specs are quite higher in an HPHT well. The valves, for example, are quite large. Moving to a valve-based technology helped improve deployment efficiency,” Goldsmith said.

“Functionally, the valve-based system is not much different than the ram-based technology. After landing the capping stack, we follow a sequential series of actuating the valves to slowly shut off the flow and then the final shut-in process begins by slowly choking the well down to a pressure to choke it in sufficiently until the well is shut off,” he said.

The response system's components include subsea dispersion, well capping, interim collection and extended flowback, enabling the company to respond to a wide array of well control incidents.

The company also has a pair of dedicated tankers, or modular capture vessels, that combined can capture up to 100,000 barrels of oil and flare up to 200 million cubic feet of gas per day. [\(Copyright\)](#)