Capping Stacks
The capping stack is the centerpiece of the Marine Well Containment Company (MWCC) Containment System. MWCC’s three capping stacks – the Subsea Containment Assembly (SCA), the 15k psi Capping Stack (single ram) and the 10k psi Capping Stack (dual ram) – are uniquely designed to cap or cap and flow a well in a deepwater well control incident in the U.S. Gulf of Mexico.

About the Capping Stacks
In a cap only scenario, the capping stack has the ability to shut off the flow of fluids from the well. In a cap and flow scenario, the capping stack can redirect the flow of fluids through flexible pipes and risers to one of the Containment System’s Modular Capture Vessels (MCVs) for processing and offloading.

Each capping stack varies in dimensions, response capabilities and use depending on the specific parameters and conditions of the well incident site.

Subsea Containment Assembly At-A-Glance
- **Depth**: 10,000 feet (cap only and cap and flow)
- **Temperature**: 250 degrees Fahrenheit
- **Pressure**: 15,000 psi
- **Dimensions**: Approximately 34-40 feet tall, based on configuration, and just under 20 feet wide
- **Weight**: 170 tons
- Shutting the ram requires the Subsea Accumulator Module

15k psi Capping Stack At-A-Glance
- **Depth**: 10,000 feet (cap and cap and flow)
- **Temperature**: 350 degrees Fahrenheit
- **Pressure**: 15,000 psi
- **Dimensions**: Approximately 26 feet tall and 16 feet wide with the necessary lifting gear
- **Weight**: 100 tons
- Shutting the ram requires the Subsea Accumulator Module

MWCC’s SCA can be disassembled into two sub-assemblies, which facilitates handling and transportation if deployed.

MWCC’s 15k psi Capping Stack is one of the few capping stacks in the industry capable of handling temperatures of 350 degrees Fahrenheit at pressures up to 15,000 psi.
Designed for use on wells where well casings and riser systems are closely spaced, MWCC’s 10k psi Capping Stack is easier to maneuver due to its smaller footprint.

The capping stacks are stored at MWCC’s MCV Shore Base in Ingleside, Texas, near Corpus Christi, where they are tested and maintained in a constant state of readiness by MWCC and with the help of third-party contractors. The tests performed on the capping stacks include:

- Every six months, each capping stack undergoes a full pressure test in which the capping stack is tested to ensure there are no leaks.
- Each quarter, MWCC administers visual and function tests, which comprehensively test all valves, rams and assemblies on each capping stack.

### Deployment

In the event of a deepwater well control incident in the U.S. Gulf, MWCC will mobilize and deploy the capping stack from the MCV Shore Base to the incident site via an installation or supply vessel. The capping stack is then deployed to the subsea well in one of three ways depending on operator preferences and vessel layout. These ways include:

- On a wire off the side of the vessel using a heave compensated crane
- On a wire from the stem of an anchor handling vessel using the A-frame
- Lowered from the drill rig using a drill pipe

Once subsea, the capping stack is installed on the well bore and interconnected to additional subsea equipment to begin the process of containing the well. There are three ways to attach the capping stack to the well:

- Attach to the top of the blowout preventer (BOP)
- Attach directly to the wellhead
- Attach to the low marine riser package (LMRP)

A Remotely Operated Vehicle (ROV) controls the 10k psi and 15k psi capping stacks in either a cap only or cap and flow scenario and controls the SCA in a cap only scenario. In a cap and flow scenario, the SCA is controlled remotely with an umbilical connected to the MCV. The umbilical is also used to obtain real-time data from the well such as temperature and pressure.

### Containment Scenarios

The capping stack chosen for mobilization will depend on the specific well containment requirements and condition, including the well’s temperature, pressure, proximity to other wells and risers, and whether it has been cited as cap only or cap and flow. All three capping stacks provide a dual barrier, blowout preventer ram and a secondary containment cap.

The SCA will primarily be used in a cap and flow scenario. Depending on the well’s condition, it can be configured in the manner required for an incident. The SCA’s design allows the capping stack to be disassembled into two sub-assemblies, facilitating handling and transportation.

Capable of handling temperatures up to 350 degrees Fahrenheit, the 15k psi Capping Stack can be used to cap or cap and flow wells that involve higher temperatures.

The 10k psi Capping Stack will mainly be utilized in cap only scenarios in which well casings and riser systems are closely spaced, such as tension leg platform (TLP) and spar applications where wells are beneath a floating production facility.