



## What is a Blowout Preventer (BOP) stack?

**A** **Blowout Preventer (BOP)** is an assembly of specialized valves or similar mechanical devices installed, during drilling, between the wellhead system and the drill floor. It is used to seal, control and monitor the well in case of blowout.

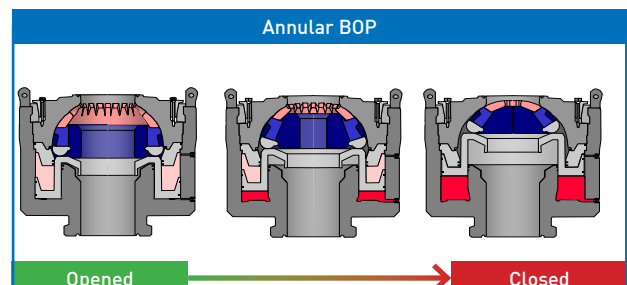
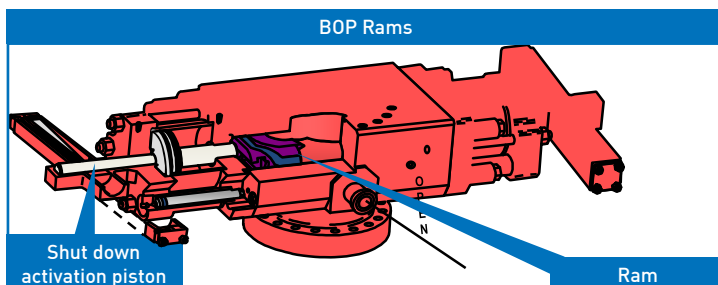
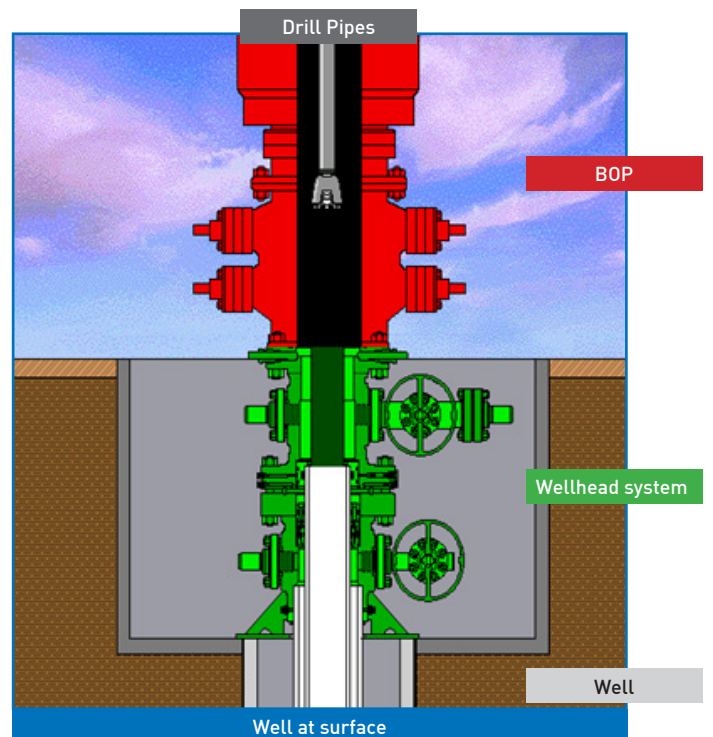
### BOP ACTIVATION

The BOP allows the well to be controlled at any time. It is usually installed redundantly in stacks.

A BOP is usually composed of:

- an annular BOP, which can close the well at different devices such as the drill string, for example,
- different types of Rams, which can close the well with the drill-pipe inside the well. In an emergency shear Rams can be used to cut the pipe inside the well if necessary.

All the Rams are hydraulically activated. During drilling operations the closure of the well with the BOP can be manually or automatically activated.

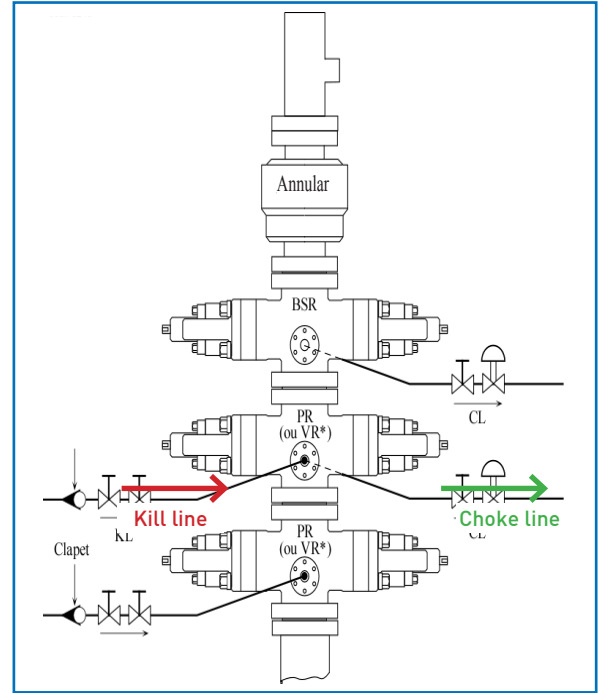


## BOP PRINCIPLES

To control a Blowout, the BOP Stack is fitted with hydraulic lines which allow drillers:

- to pump a heavier drilling fluid in the well (Kill line),
- to evacuate the lighter fluid from the well (Choke line).

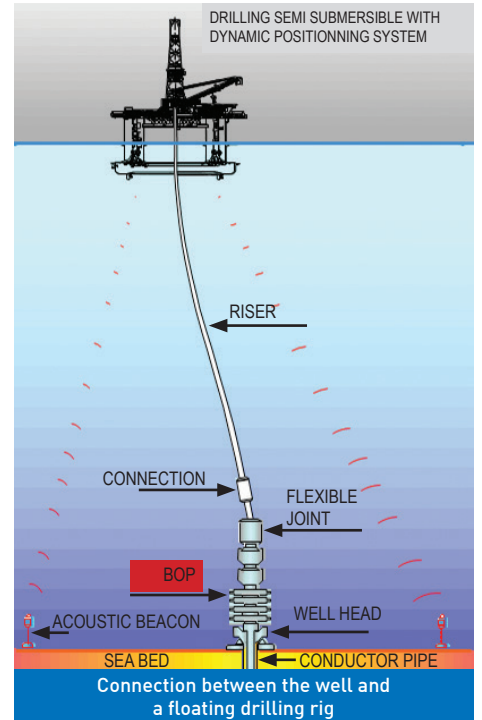
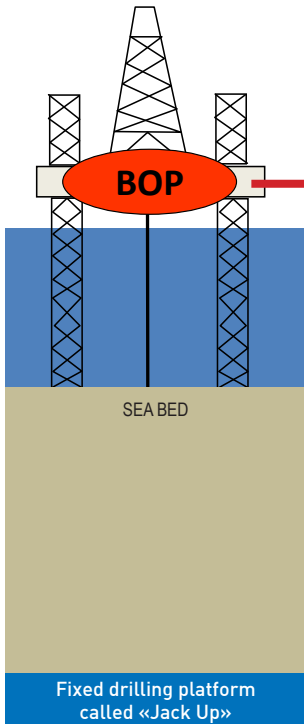
The service pressure of the BOP is chosen to support the maximum pressure encountered during drilling operations. The pressure range is usually from 5000 psi to 15000 psi (345 bar to 1035 bar approximately).



## OFFSHORE DRILLING SPECIFICITIES

In shallow water, if the water depth is under 450 feet approximately, the drilling platform is in contact with and fixed to the sea bed. This means that the BOP can be installed at the surface (as for onshore wells) on top of the wellhead system at the level of the platform.

In deeper water, the drilling rig should be installed on a floating device (semi-submersible or drill ship). In a storm, because of the bigger waves and the heavier swell, the floating rig should be disconnected from the well. Located at the sea bed, above the subsea wellhead system, the BOP will stay connected to the well ensuring the well's safety and security.



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