System Increases Subsea BOP Control System Availability

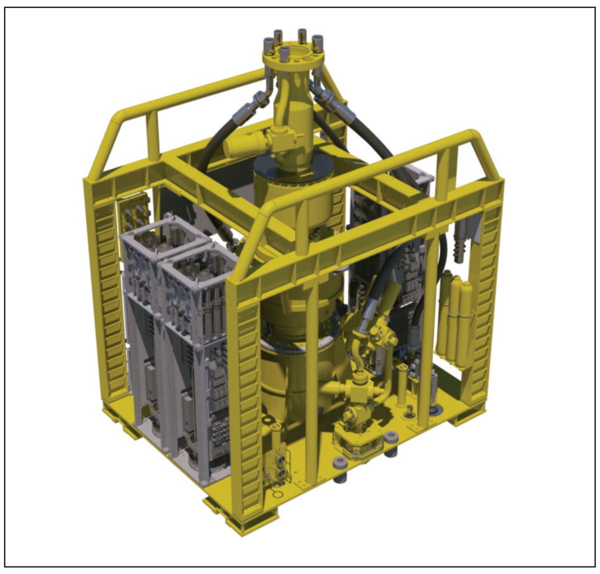
■ Industry's first three-POD system, a Spotlight Award winner, adds a redundant spare.

BY ASHLEY ORGAN, CAMERON

The BOP, a primary component of the subsea drilling stack system, contains wellbore pressures by sealing around or shearing through drillpipe, as necessary. A subsea control system's point of distribution (POD) is the component by which BOPs and other parts of the subsea stack are operated, often in water depths up to 3,658 m (12,000 ft). Retrieval of the subsea control system POD for unexpected maintenance can cost drillers several days of downtime and millions of dollars.

Conventional subsea BOP control systems use a two-POD design, providing a single redundant spare POD. This means that if the primary POD becomes unavailable, drillers can switch to the second POD to control the BOPs and seal the well before bringing the BOP stack to the surface to repair the nonworking POD. Unfortunately, this also means that the stack still must be pulled for repair if one of the two PODs fails.

In response to the need for added redundancy to further reduce downtime, Cameron has introduced its Mark IV high-availability (HA) control system, featuring the industry's first three-POD design as an option for subsea BOPs, which eliminates the need to pull the stack if the primary POD fails.



The added redundancy on Cameron's new three-POD system increases stack availability to 98% with a smaller footprint than conventional two-POD systems. (Image courtesy of Cameron)

Control system design, capabilities

The Mark IV HA control system is built upon the Mark III design. Cameron improved upon its Mark III two-POD technology to allow for an innovative three-POD configuration without increasing the size of the subsea stack.

In addition, the new system allows drillers to continue operating when one POD becomes unavailable. The nonworking POD can be repaired when the stack is pulled for scheduled maintenance. Because of this configuration, Cameron's Mark IV HA control system improves operational availability to as much as 98% and reduces the likelihood of a POD-related stack pull by up to 73%. Each time the BOP stack is run to the wellhead, there is risk of damage, failures and contamination of the environment. By reducing the need to retrieve the stack in the event of a control POD failure, the risks associated with the retrieval and rerunning of the stack are reduced as well.

Each Mark IV HA POD also increases functionality over the Mark III POD by 33%. The simplified design improves reliability and creates a smaller footprint. Tubing connections have been reduced by 50%, therefore decreasing potential leak paths. Redundant solenoid pilot regulators have been added so that they are no longer a single point of failure within the POD. Pressure-compensated pilot accumulators adjust automatically for water depth, mitigating the risk of human error and reducing maintenance costs. POD size was reduced by 26%, and the weight is one-third less than competing control PODs. ■

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The d5 program is about more than listening, he said. "This will be a full-contact sport," Balint said. "d5 offers the chance to be exposed to great thinking and then provides the opportunity to mix it up, probe and explore what-ifs with the speakers and peers in discussion sessions. Our intention is to have participants leave with new ideas to impact their company and our industry. There are only 400 seats available for this extraordinary program. I recommend people book a seat as soon as possible to assure they can be part of this."

Whether the fresh thinking from the outside that d5 hopes to achieve will result in new solutions for offshore operations remains to be seen, but the effort seems well worthwhile. One thing that almost all offshore players would agree upon is that the industry can't keep doing things the same way forever. ■