Surface BOP guidelines nearing finalization

THE USE OF surface BOP (SBOP) systems on floating MODUs to reduce the amount of time to drill a well was pioneered by **Unocal** in the early 1990s when it produced its Saturation Exploration (SX) strategy in Indonesia. The SX strategy was to drill as many prospects as possible, thereby increasing the statistical opportunity for success. A key to the effort was to minimize the time to drill each well, subsequently reducing costs.

Unocal began utilizing SBOPs in mid-1992 for its deepwater SX program. As the nuances of using SBOP became clearer, the operator was able to drill a 16,000 ft well in more than 6,700 ft of water in less than 18 days.

SBOP has the added benefit of increasing the water depth capability of many floating rigs. The BOP is smaller and lighter resulting in lower variable deck load requirements of the rig along with lower riser tensioner capacity. With regards to HSE, many operators feel the BOP at the surface rather than on the sea floor means that well control events can be handled more quickly and safely.

Since Unocal first utilized SBOPs, other operators have followed suit, including **ConocoPhillips** in China, **Santos** in Indonesia and **Shell** in Brunei, Brazil and Egypt.

SBOP ADVANTAGES

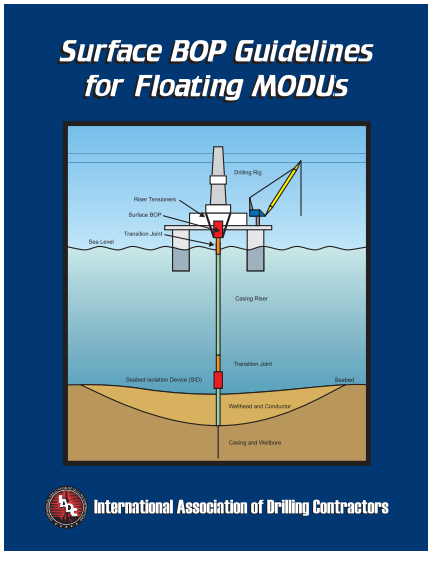
The most obvious advantages of SBOP over conventional subsea BOPs is the potential to use smaller and less expensive rigs to drill the same well. There is also the opportunity to increase the water depth capability of existing rigs. Additionally, drilling with an SBOP system results in better efficiency and lower overall costs of the well. This is achieved because drilling a well using SBOP techniques can result in quicker deployment and retrieval of the riser and associated equipment plus improved circulation rates in the wellbore that result in higher rate of penetration. Also, smaller mud volumes combined with increased circulation rates reduce circulation times.

Improved safety also results from the use of SBOP systems due to fewer heavy and complex pieces of equipment to handle and maintain. This decreases the exposure risk for the crew.

A smaller rig that uses less fuel, mud and chemicals means a cleaner, environmentally friendly drilling operation.

SBOP LIMITATIONS

There are some limitations to SBOP, the foremost of which is operating environment. To date, SBOP operations have been conducted in generally benign sea and weather conditions; experience in unexpectedly rough conditions has been successful but limited.



Also, generally the riser diameters in an SBOP system are smaller than the conventional 21-in. marine riser, limiting the hole size drilled and the number of casing strings in the well.

Typical riser sizes may range from 10 ¾-in. to 16-in., meaning conventional 18 ¾-in. casing hangers will not pass through the SBOP pressure containing riser, requiring wellheads with smaller through bore and hanger profiles. Additionally, the number of casing strings that can be run in a well may be limited due to riser and wellhead size limitations. Alternatively, casing strings must be hung off as liners below the wellhead in some cases.

The riser's pressure rating will be limited when compared with conventional marine riser. A 16-in. SBOP riser may be limited to 5,000 psi working pressure and 10 ¾-in. SBOP riser may be limited to 10,000 psi working pressure.

SBOP GUIDELINES

Due to the increasing popularity of SBOP systems amid the lack of guidelines, IADC formed a task force to develop SBOP guidelines, a draft of which is complete. It will be formally launched and available at the IADC Annual Meeting in September in New Orleans.

While there are numerous existing standards and guidelines for conventional drilling operations, some of which cover many parts of SBOP system design, configuration and operation, there were no SBOP specific guidelines that the industry could use in planning and implementing SBOP operations. As a result, the approach to SBOP operations was driven by specific circumstances and individual operator preference rather than by broadly accepted best practices.

IADC took the initiative to develop SBOP specific guidelines beginning in November 2002 when it hosted a conference on SBOP drilling operations. More than 250 attendees from industry and government participated and shared information at the conference.

An IADC task force met in February 2003 to develop guidelines to aid in planning and conducting SBOP operations on floating rigs using existing best practices, experience and study of the contributors developing them. The taskforce assembled three committees and an overall IADC Steering Committee directed the work.

SBOP TASKFORCE

The various committees were staffed with numerous drilling experts from industry and government. The Well Construction and Planning Committee considered well system design and configuration; wellhead and foundation; seabed isolation device; high pressure riser; surface BOP; control systems; operating procedures; and well control.

The Well Construction and Planning Committee is comprised of **Ken Dupal** (Chairman), **Shell E&P**; **Mike Berchenhoff** (Vice Chairman), **Hydril**; **Jim Brekke**, **GlobalSantaFe**; **Peter**

Wilson, GlobalSantaFe; **Bob Watts**, **ENSCO International**; **Ronnie Hall**, **Atwood Oceanics**; **Alan Qintero**, Atwood Oceanics; **Robert Weiss**, **Noble Drilling**; **Steve Actis**, **ConocoPhillips**; Kenneth Young, **Stress & Mohr**; **Fereidoun Abbassian**, **BP America**; **Riddle Steddum**, **Transocean**; **Pat Roger**, **Diamond Offshore**; **Scott Steedman**, **FMC**; **Gerald Ragnes**, **TFE**; **John Greenip**, Hydril; **Andreas Katsounas**, **Stress Engineering Services**; **Chuck Miller**, Stress Engineering Services; **Chris Bartlett**, FMC; **Bruce Bradley**, **VAM PTS**.

The Drilling Vessel Equipment Committee addressed rig modifications; critical equipment; stationkeeping; riser and mooring; riser tensioning; load path; operational guidelines; and metocean and soils.

The Drilling Vessel and Equipment Committee includes **Bill Hunter** (Chairman), **Katy Drilling Ltd**; **Bryan Sanchez** (Vice Chairman), Transocean; **Mark Childers** (Steering Committee Liason), Atwood Oceanics; **Gert Jan Schepman**, **Gusto MSC Ocean Design**; Alan Quintero, Atwood Oceanics; **Ralph Linenberger**, (Steering Committee Liason), GlobalSantaFe; Robert Weiss, Noble Drilling; **Johnny Kotria**, **Cameron**; **Hugh Elkins**, **Varco Shaffer**; **Eric Magne**, **Shell Deepwater**; **Maynard Chance**, Hydril; **Ian Nott**, Shell E&P; **Jim Nowotny**, Atwood Oceanics; **Bob Watts**, ENSCO International.

The HSE Committee developed guidelines for risk assessment; well control; environmental discharge contingency plans; emergency response; planning and preparation; equipment verification and specification; personnel training.

The HSE Committee includes **Barry Harding**, (Chairman), **Harding Resources Inc**; **Steve McCoy** (Vice Chairman), ConocoPhillips; **David Troquet**, **MMS**; **John Pruitt**, **ABS Consulting**; **Curtis Wilie**, Shell E&P; **Tom Shackleford**, GlobalSantaFe; **Henk Birmingham III**, GlobalSantaFe; **Rian Richie**, Shell E&P; **Walter Cabuccio**, Transocean; **Patricia Morin**, ABS Consulting; **Dave Juda**, Hydril; **Jim Gillenwater**, Atwood Oceanics; **Dan Eby**, **Wild Well Control**.

The Steering Committee includes **Earl Shanks** (Chairman), Transocean; **Graham Brander** (Co-Chairman) Shell; **Moe Plaisance**, Diamond Offshore; **Mark Childers**, Atwood Oceanics; **Gary Bush**, Unocal; **Brett Borland**, ConocoPhillips; **Ralph Linenberger**, GlobalSantaFe; Jim Brekke, GlobalSantaFe; **Steve Kropla**, IADC; **Jason McFarland**, IADC; **Don Howard**, Minerals Management Service (MMS); **Bill Hauser**, MMS.

SBOP WORKSHOP

IADC is sponsoring an SBOP Workshop scheduled for 1 December at the Omni Hotel West in Houston. More information and program details will be presented in future issues of *Drilling Contractor*.