Blowout, accumulator issues in well control session

RISERLESS DRILLING

Riserless drilling has become an increasingly important aspect of deepwater operations. This is particularly true when drilling in areas with shallow gas and shallow water flow potential.

This paper highlights the operational pre-planning and successful results of drilling of a deepwater prospect with both known and unknown shallow hazards. This includes drilling fluid and supply vessel management and its relationship to the successful operation.

Riserless Drilling Performance in a Shallow Hazard Environment (SPE/IADC 79878) by **P R Roller**, **Ocean Energy**.

BLOWOUT CHARACTERIZATION

Blowouts in water depths to 10,000 ft (3,000 m) have potential ramifications not currently understood. Work has been done by several investigators to analyze blowout plume behavior, particularly with a view towards buoyancy and centerline plume wandering in the region immediately below sea level. To date, a more comprehensive reservoir-to-sea level study has yet to be undertaken and reported in the literature.

This paper reports on results from work to characterize blowout behavior in deepwater environments. The initial effort was to use reservoir and phase behavior modeling to determine mudline flow rates under worst-case conditions.

Characterization of Blowout Behavior in Deepwater Environments (SPE/IADC 79879) by **N J Adams**, **Neal Adams Services**; **M J Economides**, **University of Houston**.

DUAL GRADIENT WELL CONTROL

Beginning around 1996 four projects were begun to develop dual gradient drilling technology for use in water depths greater than 5,000 ft. The four projects are Shell Oil Company's project; the SubSea MudLift Drilling Joint Industry Project; SMD, the Deep Vision project; and Maurer Technology's Hollow Glass Sphere project.

The paper reports on a comparison of the well control aspects of dual gradient drilling to that of conventional riser drilling. It is based upon the work that the authors performed as part of the SMD project.

Well Control Procedures for Dual Gradient Drilling as Compared to Conventional Riser Drilling (SPE/IADC 79880) by **J S J Schubert**, **H C Juvkam-Wold**, **Texas A&M University**; **J Choe**, **Seoul National University**.

SUBSEA ACCUMULATORS

In general, the offshore drilling industry has long accepted the concept that subsea accumulators are required for offshore BOP control systems in order to satisfy certain industry standards and regulations.

However, in some instances subsea accumulators may not be necessary, provided an appropriately sized rigid conduit line on the marine riser is utilized. Moreover, the actual energy derived from subsea accumulators may fall short of the perceived benefits.

The authors analyze the available hydraulic energy through BOP control system supply lines of various sizes. The effect of water depth on the available energy in subsea accumulators is also examined.

The paper concludes with recommendations on how to best maximize the required energy to operate subsea BOP stacks.

Subsea Accumulators, Are They a False Reliance? (SPE/IADC 79881) by **J P Curtiss**, **Atwood Oceanics**; **M Buckley**, **Cameron Controls**.

DYNAMIC FREEZE PLUG

A Dynamic Freeze Plug Process (DFPP) was applied to several packerless Sajaa Field wells to achieve a second mechanical annular pressure barrier prior to removing the trees for hydraulic, live well workover operations.

Four wells were successfully frozen with minimal fluid lost to the formation. Several equipment and procedural modifications made after the first job improved subsequent jobs and reduced the time required to complete the freeze and achieve a barrier. The DFPP is a proven technique to achieve an annulus barrier in a gas filled environment.

In general, the offshore drilling industry has long accepted the concept that subsea accumulators are required for offshore BOP control systems in order to satisfy certain industry standards and regulations. However, in some instances subsea accumulators may not be necessary, provided an appropriately sized rigid conduit line on the marine riser is utilized. Moreover, the actual energy derived from subsea accumulators may fall short of the perceived benefits.

Dynamic Freeze Plug Process Proves a Viable Barrier Technique in Sajaa Field, Sharjah, United Arab Emirates (SPE/IADC 79882 - Alternate) by **R Pruitt**, **Amoco Sharjah Oil Co.**; **J Tuppen**, **Boots and Coots**; **B Powers**, **BP**.

LOST STATION EVENTS

With the tremendous increase in the number of dynamically positioned rigs now in service, an increased number of lost station events would be expected.

However, the large number of systems installed over the past few years caused resources to be stretched in this technology area similar to those that occurred in other machinery and systems used in fifth generation deepwater drilling rigs.

The experience of the industry was therefore spread through these operations, generally reducing the expertise on a given program, while experiencing a high training curve. As a result, a higher than expected frequency of lost station events has been experienced by the industry.

Lost Station Events - An Analysis (SPE/IADC 79883 - Alternate) by **J P Sattler**, **West Engineering Services**.