DEA(e) 3rd Quarter Meeting
11th and 12th September 2008
Hosted by National Oilwell Varco in Kristiansand, Norway

Topic: Deepwater Operations

Dear DEA(e) Members,

Please find enclosed the CD containing the presentation material from the 3rd Quarter 2008 DEA(e) meeting held in Kristiansand, Norway.

Our sincere thanks go to Alan Jackson at NOV for the excellent hospitality and organisation for the third DEA(e) meeting of 2008.

Alan Jackson opened the meeting with a warm welcome and mentioned that Kristiansand had been chosen as the venue because it was where NOV made some of their deepwater hardware. He hoped all enjoyed the meeting and he hoped that the content of the meeting would help all present.

The meetings technical chairman, Jakob Christian Gyldén (Maersk) put together an excellent range of speakers with the help of the DEA(e) committee which resulted in a wide ranging overview of the different technical subjects. Jakob gave an excellent opening to the meeting and talked about the shape of the day and a half and what subjects would be covered by the presentations coming up.

The 1½ days saw a broad range of excellent presentations from operators and service companies.

The day was started with a presentation from NOV on advancements made to subsea BOP stacks & controls and started by talking about the use of depth compensated bottles which offer the advantages of smaller footprint, lighter stack, less maintenance and better access before moving on to stronger, cleaner and smarter systems. BHI then presented on the development of a new concentric reamer. Which can address several of the potential deepwater challenges including: sloughing shale, reactive formations, ECD optimization, complex casing designs, monobore well design, borehole friction and completion requirements. Mark presented on their project to field test a novel concentric expandable reamer run with tandem downhole optimization tools with objectives to understand bit and reamer interaction and attempt to improve the system drilling performance through a total system approach. We then had a dual presentation from Chevron on Rosebank-Lochnagar appraisal campaign review followed by a presentation on the new high-spec drillship (Stenna Carron) about to be received by Chevron. Eric Emerson presented on Rosebank appraisal campaign. Rosebank is in 3700ft of water West of Shetland. Eric talked about 3 wells, 1 sidetrack and 1 well test. Eric talked about lessons learned in the planning stages and also on all of these operations. The next presentation by Doug Mowat of Chevron talked about the Stenna Carron drillship. Doug started by talking about the impressive safety record – 2.4million man hours without LTI. Doug went through the specifications and changes made to the drillship and ended with a comparison of efficiency of a dual derrick compared to a single derrick.

There followed a workshop where participants discussed the following:

Operators usually spend considerable resource on contingency planning for deepwater wells.
With high rig rates and complex wells, this can be a significant cost.
What degree of uncertainty do you plan for?
Exploration wells have lots of contingency plans, but only a fraction are utilised.
List the contingencies and what could be done to address them? (e.g. share the contingency with other operators / joint purchasing problems / borrowing or sharing of equipment)

StatoilHydro then presented on “Future developments in subsea technology for deep water applications”. Steiner talked about 4 enabling technologies to help achieve a reduction of the total cost for subsea wells in 2010: slender well solutions, steerable liner drilling, MPD / dual gradient drilling and automated drilling. Marintek than talked about vortex induced vibrations of drilling risers. Carl covered the following points in his presentation: basic principles of VIV, test methods and results, VIV analysis and finished with an example drilling riser. Halliburton talked about the application of wired pipe in deepwater environments. Morten talked about the specific challenges for deepwater: pore pressure prediction, improved reservoir definition, improved subsalt imaging and fracture gradient prediction. Morten discussed seismic while drilling as a suitable tool for deepwater as it is able to look further into the formation. Weatherford then

talked about the develoment of drilling with casing in deepwater applications. Scott covered the challenges for subsea drilling with casing and ran through a potential process for drilling subsea with casing.

On the second day there were two presentaitons. The first from Altus well experts talking about trapped annuli pressure buildup while drilling and operating. Simon explained that annulus pressure buildup due to constrained thermal expansion of fluid in a sealed annulus is a widely recognised phenomenon in subsea wells and it is generally only considered to be an issue for production operations. It is also generally considered that assuming the fluid is sealed in the annulus at the geostatic temperature (UDT) is conservative. Simon went on to ask if UDT is actually conservative in deepwater with a few simulaitons? The last presentation was from Reelwell about a MPD technology which has advantages for deepwater operations. Ove described the development of the technology and the fact that a full scale prototype verification has taken place at Ullrigg. The next stages are: certification of tools and procedures in 2008 (DNV will participate in this), an onshore pilot well in Q1 2009 (plain drilling with MWD / directional tools out of $9^5/_8$ casing) followed by an offshore pilot well in Q3 2009.

On the Thursday evening, NOV hosted a tour of Kristiansand zoo with sundowners followed by dinner at the zoo. The event was well attended and enjoyed by all. The highlight for many were (i) seeing Siberian tigers very close up (ii) a superb meal including antelope steak (so I'm told!). Thank you to NOV for going to all the trouble, effort and cost of organising such an excellent evening.

Lastly, please join me in thanking the steering committee who are: Ivor Palmer (BG and Chairman), Sigve Hovda (StatoilHydro), Odd Harald Thowsen (Odfjell Drilling), Alistair Oag (Schlumberger), Jens Melchoirsen (DONG) and Neal Whatson (OMV). The steering committee put significant time and effort into ensuring that the members' interests are at the forefront of DEA(e) activities.

As ever, if you have any questions or thoughts regarding the DEA(e), please do not hesitate to contact Dawn or Shreekant on dawn.dukes@otmnet.com / shreekant.mehta@otmnet.com +44 1483 598 000.

With regards
Shreekant Mehta