Survey Report Released: Current Trends and Biggest Challenges in HPHT Operations

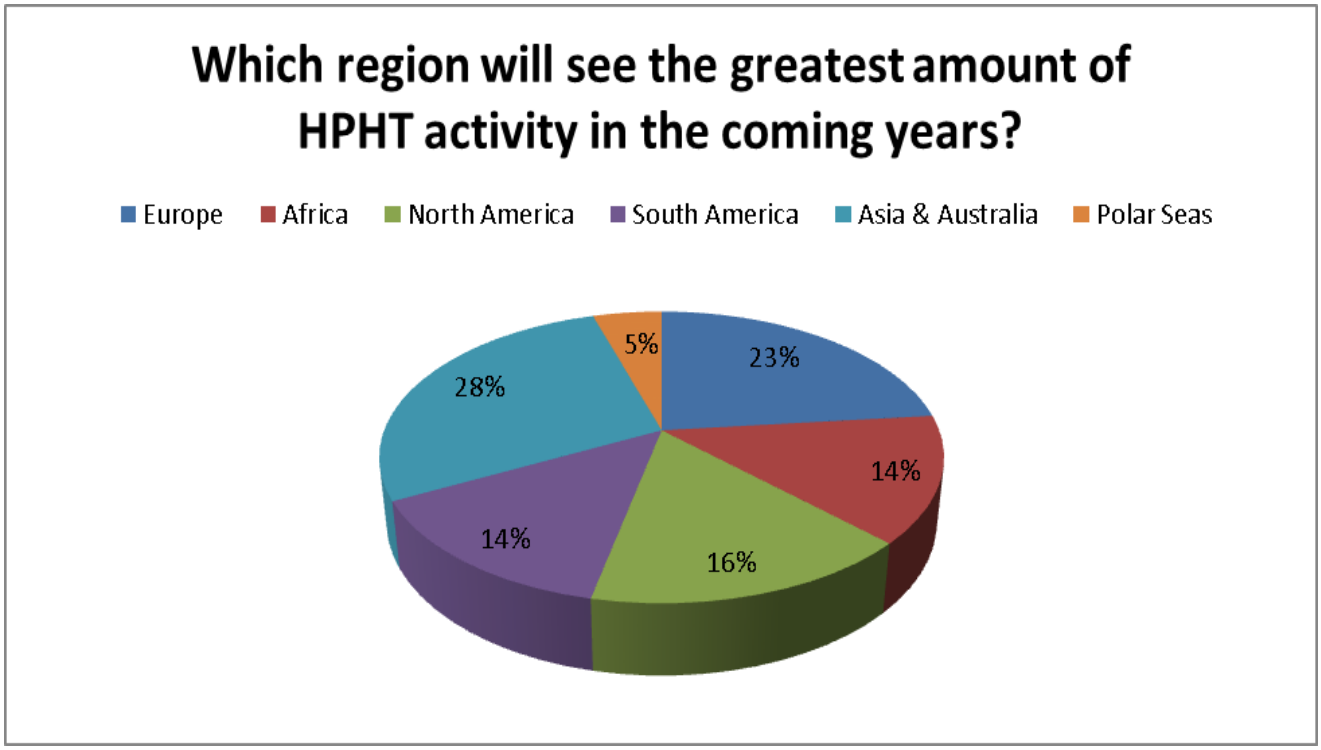
As conventional reserves dwindle worldwide, the development of high-pressure, high-temperate (HPHT) wells has come as an almost inevitable consequence of the oil industry's need to find new reserves.

According to the latest global proven oil reserves figures, there are 1.4 terabarrels ($1.4x10^{12}$) left on planet Earth. At current consumption levels, that would be enough hydrocarbon to keep every oil dependent piece of machinery running for around the next 43 years.

As the industry digs deeper than ever before in search of the black stuff, companies are dealing with the challenges presented by extreme depths and temperatures from Saudi Arabia to the North Sea, with some countries even offering incentives to stray into these more risky environments as energy demand rises.

In a recent survey, Oil & Gas iQ canvassed its 57,000-strong membership on the future of this pioneering industry sector.

Focus on Asia



Respondents agreed that the biggest areas for HPHT expansion would be the North Sea and the Asia Pacific (APAC) theatres.

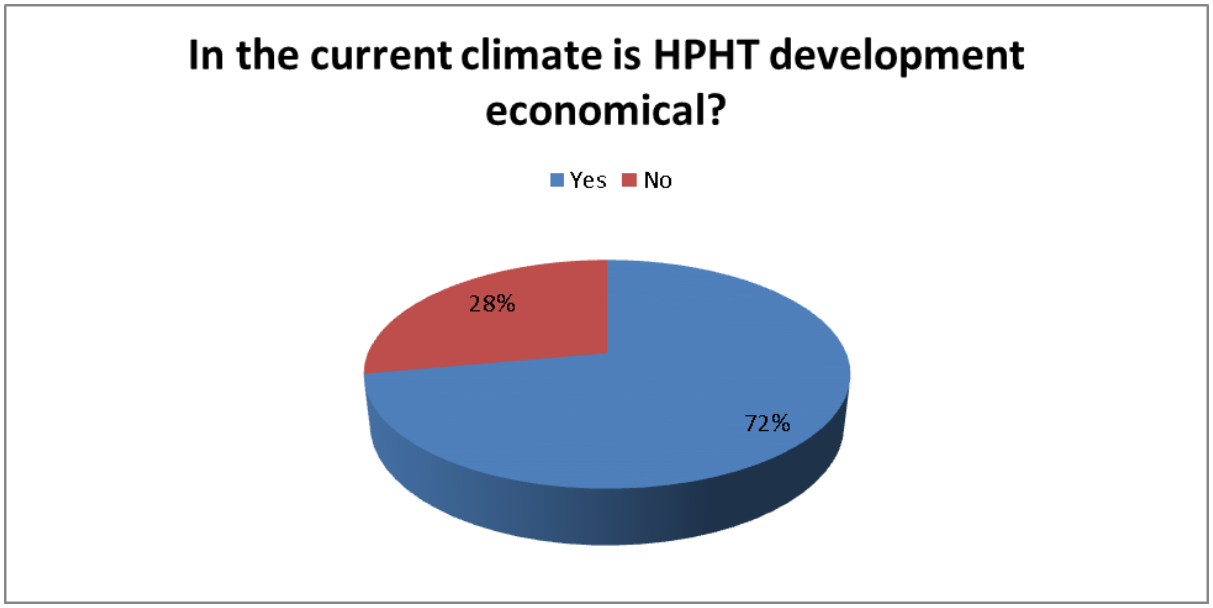
Most of the development in APAC region is concentrated around China and Australia in the form of large-scale South China Sea developments, as well as offshore India and Malaysia,

where Petronas have spent as much as USD $4.7 billion on development of the North Malay Basin.

With the majority of the 130 FPSO (floating production, storage and offloading) units to be commissioned through 2016 set to operate in the APAC region, HPHT action is clearly of paramount contemporary and future importance.

In the North Sea, the Central North Sea and West of Shetland zones are a particular hotbed of current HPHT activity, with companies like GDF Suez and BG Group heavily invested in HPHT and extreme HPHT projects. The success of GDF's Tesla project - which came in ahead of time and under budget in 2011 - was a boost for HPHT drilling across the globe, proving that economical headway can be made on these notoriously tricky projects.

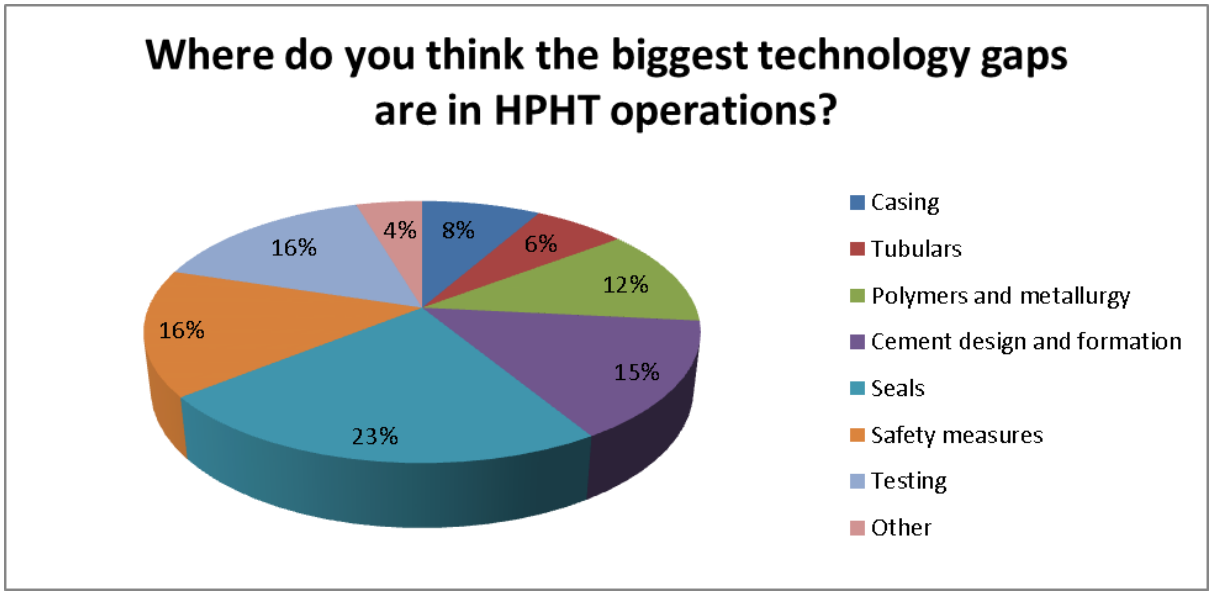
HPHT – High Price, High Turnover?



One of the factors that had previously kept companies out of the HPHT arena was the cost involved with development. According to the respondents of our survey, the spectre of money is no longer a factor in the promulgation of HPHT wells.

Respondents suggested that the main factor behind this has been the price of oil consistently above and around $100 per barrel, and the simple fact that at a time when oil is hard to come by, the necessity of finding new resources outweighs short-term economic considerations.

Technological concerns

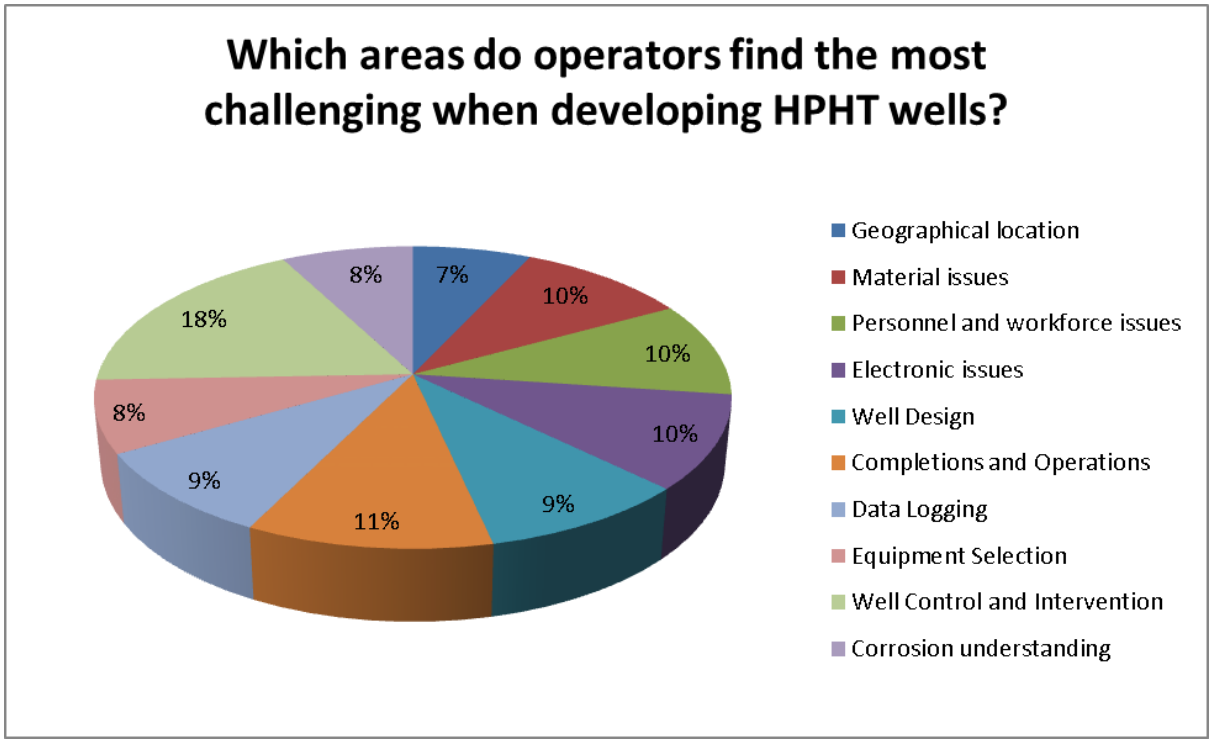


With the harsh and, in oil and gas terms, alien conditions of the HPHT world, technological capability and fit-for-purpose equipment is of the utmost importance in order to stave off the dreaded scenario in which a kick on a well might lead to a casing rupture or blowout.

In the case of the Montara well blowout in 2009 and the much more publicised Macondo blowout and oil spill in the Gulf of Mexico in 2010, one of the main contributing factors to failure of the well in both cases was a substandard cement job.

Despite this, our respondents picked out *cement design and formation* as the third most concerning technology gap in the HPHT arena, behind *safety*, *testing* and *seals*,which just under one quarter of the surveyed professionals signalled as the area of most concern.

HPHT – Hiring Personnel = Hard Times?



According to our poll, amongst the issues that are prevalent in HPHT well development, the one that stands out most for our respondents is the lack of properly-trained and experienced staff to fill the ever expanding portfolio of global HPHT ventures.

Framed in the general context of the upcoming Great Crew Change, this is a problem that will doubtless get more serious in its gravity as time goes by, particularly as the two areas that will be experiencing the largest growth in HPHT operations are drawing upon pools of talent will unfavourable demographics.

Conclusions

The advent of HPHT wells have come as a result of technological advancement filling societal need. There is no doubt that if we were still living in “the age of easy oil” HPHT, with its myriad challenges and cost implications, would very much be on the back burner.

But easy oil is gone, and with 43 years left till Terminal Dry Out and the world population set to hit nine billion by 2040, the heat is on for the oil and gas sector to find enough resource to keep the world turning.

HPHT will inevitably be making a huge impact in the industry going forward. The spectre of the Macondo blowout and the recent leakage at Elgin have not helped the industry in PR terms, and there are significant technological issues to be faced as the industry goes deeper into the Earth.

However, the most significant concern for the future is that which is starting to affect the industry across the board – an ageing workforce that is not replenishing itself, perhaps a more worrying prospect than all the blowouts and technological failings combined.