

Deepwater: an industry

Oil company Texaco is at the forefront of the industry's search for new technological solutions to tap reserves in ever deeper waters. MARIN Report talked to PAUL DEVLIN, the US company's senior model test specialist and Chairman of DeepStar's Vessels, Moorings and Riser Committee seeking his views on achievements, present and future, of the sector.

Paul Devlin: "Some basins cannot produce the high currents and depths that we need." aul Devlin told MARIN Report: "Model testing invariably has a part to play whenever we are planning new production solutions. In fact, I've attended MARIN in my capacity as a model testing specialist three times in the last five years." He explained that as the industry looks for oil and gas reserves in ever deeper waters, it increasingly deploys a combination of techniques both computational and physical to ensure that the production solutions chosen behave the way they are designed to.

Deepstar programme

"As an industry, when we've been generating deepwater solutions, it is correct to say that we generally gear our design processes to the facilities that are available to us. In fact, as part of the DeepStar programme (an industry wide effort which aims to stretch the deepwater design envelope with collaborative research) we have a couple of studies ongoing to investigate precisely what our analyses and physical testing options are. Currently Marintek is working on a program called Overview of Hydrodynamic Verification of Deepwater Floating Production Systems. This allows our industry to examine the various computing-based and model testing-based design tools.

Devlin says MARIN's new Offshore Basin will be a valuable tool to test SPAR and FPSO type structures in 3,000 feet of water and TLP structures up to 10,000 feet by using the deep pit,



and he believes that once the facility opens its doors for business later this year, new impetus will be given to the energy sector to find imaginative hybrid solutions bridging gaps between physical modelling facilities and computational systems. "A couple of DeepStar studies currently in hand are intended to determine, given the fundamental limitations of a model basin, how to perform tests of spread moored systems for waters much deeper than 3,000 feet. There seems no doubt that the future will be a combination of model tests and analysis. What we're doing now is working how best we might approach this. "Ideally, we would prefer model testing facilities for extremely deep simulations, or around 10,000 feet, but we're aware of the cost and specification limitations of such facilities, so we must work today how we plan to test in the future.

offshore in depth



perspective

"The hybrid testing/analysis approach is a likely way the industry will go", he said. He adds that there are many more technological hills for the energy business to climb in coming years: "Take eddy currents as an example; we can handuse of mini-TLP processing facilities or buoys as subsea support vessels for development of marginally economic fields. Of course, in deep water we would all like to find large oil fields and to develop solutions for these. But we also need to

"MARIN's new Offshore Basin will be a valuable tool to test SPAR and FPSO type structures"

le eddy currents in our computer based analysis, but in a model basin that's been more difficult. Some basins cannot produce the high currents and depths that we need."

MARIN's new basin, however, will bring new current capabilities to bear on this challenging area.

The future

Devlin says he believes the industry's deepwater future lies with a variety of solutions, varying from SPARs to TLPs and FPSOs. "All have their place, but increasingly, finding economic and safe solutions is a key driver in our search for innovative solutions. There is certainly the possibility for solutions that will look different than we used in the past, but they will not be functionally different. We've looked at barge-like structures that can accommodate surface wellheads, intended for relatively mild environments such as West Africa. Surface wellheads are a cost trade off with maintaining a subsea well using leased drilling or workover equipment against having an on-site facility.

Innovation

"However, I don't see any major innovation such as when we went down the TLP route. As an industry, the trend seems to be innovative application of existing technologies such as the find ways of tapping deepwater marginal fields, and this could be an area which calls for an imaginative technological approach in the future.

"This progression into deeper water depths and the use of innovative production solutions highlights the need for innovative analytic solutions and the need for model testing solutions that can handle the increased water depths", he concluded.



The DeepStar Project identifies and develops economically viable, low risk methods to produce hydrocarbons from deepwater

tracts in the Gulf of Mexico. The U.S. Gulf contains significant reserves and remains one of the best domestic oil company development opportunities, but producing hydrocarbons in water this deep presents commercial and technical challenges. DeepStar is a mechanism for adapting this new market. Participants co-operate to develop the technology necessary to tackle deepwater. Texaco is sponsoring the project, MARIN is one of the contributing companies.