Improved dynamic positioning for large vessels to increase safety and effectivity in offshore operations and exploration and exploitation of marine resources (DP-JIP)

Results in Brief

Dynamic positioning of floating, production, storage and offloading (FPSO) systems

As oil prices continue to soar, the demand for new hydrocarbon supplies will be even greater. Fortunately, new techniques for Dynamic Positioning of vessels at sea can help speed extraction of deepwater reserves.

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The open ocean can be a dangerous place. Extraction of hydrocarbon stores in this environment is a challenge. Common off the coasts of Africa and South America, Floating, Production, Storage and Offloading (FPSO) systems are currently the way to go.

Keeping FPSOs in place, however, is a tricky and costly business. With traditional mooring systems, cost is usually a function of depth. Hence, for deepwater and ultra deepwater extraction, other, more cost-effective solutions must be sought after.

Dynamic Positioning (DP) is a promising FPSO-fixing technology. Rather than relying on anchors and tethers, DP maintains the FPSO's position steady with steering and propulsion units. DP automatically compensates for waves, tides, winds and other forces acting upon the FPSO.

The Joint Industry Project on Dynamic Positioning (DP-JIP) funded by the EESD Programme investigated the benefits of Real-Time Environmental Force Estimator (RTEFE) with respect to DP. Testing revealed both gains in fuel economy and increased positional accuracy. Furthermore the RTEFE-outfitted DP FPSO showed it could withstand a large range of extreme weather conditions.

The DP-JIP consortium comprised a wide range of stakeholders in the hydrocarbon extraction industry, so the approach was wide in scope. Since economics are a key component, the project also fleshed out the capital and operating expenditures necessary for a cost-benefit analysis. The results indicate the competitiveness of the new technology in comparison with traditional, non-DP FPSO solutions. Finally, from the engineering side, full detailed system designs were drawn up, including methods to retrofit existing DP FPSOs.

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