

Fugro GEOS Rises to Thunder Horse Challenge



Installation of ADCP in largest buoyancy buoy close to Thunder Horse

The quest to provide real-time full water column current measurements for BP's Gulf of Mexico Thunder Horse PDQ - the largest Production Drilling Quarters semi-submersible in the world - was met with enthusiasm by Fugro GEOS Inc, who chalked up ample "firsts" in their determination to meet the challenge.

"The contract, which has seen the system successfully operating for nearly one year, involved an extensively detailed system design, calculation, testing and the building of the first self-contained 38kHz ADCP (Acoustic Doppler Current Profiler)" explains Caroline Nicholas, Seasystems Division Manager of Fugro GEOS Inc. "The design included the repackaging of the 38kHz ADCP electronics into a subsea housing which are normally mounted topsides, and the installation of a ruggedised cable to the surface for power and data transmission. Thermal analysis was undertaken to ensure that the electronics did not overheat in the subsea housing." The 38kHz ADCP, which is capable of the longest profiling range ever achieved, is mounted on the hull of the Thunder Horse platform on a custom built frame, measuring down to depths of over 1,000m in real-time.

"Another first was the installation of the first cabled mid-water 75kHz ADCP," explains Caroline Nicholas. "Installed at 460m above the seabed

in approximately 1,860m of water - the ADCP was contained in a 76inch diameter buoy of 4,000lb buoyancy, the buoyancy supports a strain-bearing data cable which connects to a subsea electronics housing which contains power and data converters. Our third 'first' was the installation of the first cabled seabed 75kHz ADCP in 1,860m of water."

To ensure data transmission over such long distances, a pre-existing 5,500m of fibre optic cable which runs from the seabed to the Thunder Horse PDQ platform, was used. Installation of the 75kHz ADCPs was carried out using an ROV vessel. The ADCPs, were lowered into position from the vessel with assistance from an ROV, which attached the subsea ADCPs to a preinstalled custom mud mat. Data and power connections were then made using ROV wet mateable connectors. The system provides real-time full current data updates every 10 minutes to Fugro GEOS Weather Monitor software which is then displayed through the Fugro GEOS ADAM (ADCP Data Acquisition and Management) web-based system.

"We undertook beam analysis to orient the ADCPs, to avoid any interference from other subsea structures, and to ensure good quality data was delivered to the client," Caroline Nicholas explains. "Extensive testing has been done and we have found good correlation between all the instruments. Mission accomplished!"