Dolphin Geophysical and Shell Set New Seismic Standards

Dolphin Geophysical really needed to 'think big' for its recent 3D seismic survey with Shell in the 8,000km² Orange Basin, South Africa. A survey area lying between 150 and 250km off the western coastline of South Africa combined with a limited timeframe led the Norwegian firm to adopt a radical approach to get the job done: it created, and successfully operated, the 'world's largest floating object'.

Dolphin, working with Shell for the first time, won the task of surveying an deepwater basin in July 2012. The potential in this under-explored sector, with evidence of source rocks suggesting possibilities of significant oil and gas deposits, is huge... but so are the challenges in realising it.

The weather is key. Bad weather can create serious safety issues for seismic vessels and equipment. In addition, surface (wave) disturbances disrupt the operation of vessel streamers and impact upon data quality, creating unwanted noise.

Dolphin's team therefore had a limited weather window of four months to operate in. They decided that, in this particular case, size does matter.

Monster Equipment

On 25 October 2012 the Polar Duchess mobilised with a configuration of seismic equipment that had never been seen before. The firm created the 'world's largest floating object' - eight streamers measuring 8km in length and separated by a distance of 200m, constituting a moving width of 1.4km of equipment through the water. As such the total area of the apparatus being towed by the Duchess was 11.2km² (or the surface area of roughly 1,569 football pitches). Prior to this point the largest surface area of streamer equipment that had been utilised was between 8 and 9km².

Powerful partnership

The immense power of the Polar Duchess - propulsion of 2 x 7100KW (engine shaft power) and a bollard pull capacity of 210 tonnes - meant that, unlike the huge majority of seismic vessels, it could tackle the challenges of successfully navigating this heavy, wide-tow configuration through the water. Meanwhile, the processing capacity of Shell, working from its base in Houston, ensured that the best quality results could be interpreted from the acquired data, despite the fact that the streamers were so far apart.

Stuart McGeoch, Shell's Regional Ventures Exploration Manager, Sub-Saharan Africa, commented that despite the remote nature of the area and the challenging metocean conditions, the survey has been executed safely, efficiently and with a low down time. They have been impressed with the quality of acquisition data.

As a result of this successful first survey, Dolphin Geophysical has now entered into a three-year call-off agreement with Shell in Europe. The two are looking for ward to more large-scale success together in the near future.