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**INNOVATIVE FRONTIER EXPLORATION USING SEISMIC AND SEASEEPTM DATA,
INDONESIA: IMPLICATIONS FOR MALAYSIA**

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Most of the world's oil was discovered using onshore surface maps and seeps. Within the past few years, technologies developed for conventional marine hydrographic surveys and anti-submarine warfare have been upgraded, modified, and integrated for offshore petroleum exploration and in particular, deepwater (400–3,500m) exploration.

Very high resolution maps of the sea bottom and zones of oil and gas seepage may be identified using a vessel traveling at 10 knots and surveying a swath of about 4 km. Similar advances in subsea positioning enable accurately-navigated piston-core to sample features we identified on sea-bottom map. These cores can be subjected to modern geochemical analysis and therefore locations of thermogenic hydrocarbon charge may be identified.

In December 2006, TGS-NOPEC commenced the world's largest multibeam and the world's first non-exclusive SeaSeepTM survey as part of an innovative exploration program in the offshore frontier basins of Indonesia. The program was underwritten by Black Gold Energy and co-sponsored by Joint Study partner MIGAS.

SeaSeepTM data comprises:

- Multibeam bathymetry and backscatter data to provide (a) 100% coverage of the sea-floor defining structural trends and modern offsets, (b) location and concentrations of hydrocarbon seeps, and (c) core locations;
- Gravity and magnetic data to provide a regional grid of hi-res profiles to provide first order tectonic fabric and basement architecture and constrain basin thickness and geothermal gradients;
- Navigated piston cores and geochemical analyses; and
- Heat-flow and geothermal gradient data.
- The program will acquire a variety of data to conduct a comprehensive prospectivity analysis over an area of around one million square kilometers. The studies, involving some 30 sedimentary basins, will have available 35,000 km new 2D seismic data
- 400,000 square kilometers of Multibeam SeaSeepTM data including 1,200 sediment cores; 3,600 geochemical analyses; and 120 heat flow probes.

For those who believe that discoveries first start in the mind of the explorationist, perhaps the greatest benefit of the SeaSeepTM exploration program is being able to follow the onshore geology into the offshore with some clarity and confidence. With sea-bottom bathymetric data at almost four times the resolution of onshore shuttle-based topography geological features and trends are easily identified; offshore continuations of major faults are spectacularly displayed and new tectonic models generated. The method facilitates meaningful analysis of areas of complex geology not possible with regional 2D seismic alone.

The presentation will show examples from the survey and discuss possible application offshore Malaysia.