

**AAPG Annual Meeting
March 10-13, 2002
Houston, Texas**

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The Application of High-resolution Aeromagnetism for Igneous Risk-assessment, Offshore West Africa

As global hydrocarbon exploration progresses into frontier areas, the presence of recent igneous activity is one of the risk factors that must be considered. This is especially true along the margin of West Africa where Tertiary igneous activity is evident by the preponderance of volcanic island complexes and other near shore volcanic rocks. As a result of the inherent magnetic susceptibility present in volcanic and igneous rocks, high-resolution aeromagnetic data can be successfully utilized to detect their presence.

In the fall of 2000, Vanco Energy Company contracted AOA Geophysics to acquire and interpret approximately 6,000 line kilometers of airborne magnetic data over a small portion of the Vanco Dakar Offshore Profond license area, offshore Senegal. Survey specifications were optimized for the detection of shallow igneous rocks. The results of the survey indicated that such rocks were most-likely present. High-frequency magnetic anomaly patterns visible along individual profiles and in gridded magnetic data were consistent with the presence of shallow igneous sources. The anomalies displayed an excellent correlation with suspect seismic amplitude anomalies and with unusual seafloor features visible in previously collected 2-D seismic data.

Due to the magnetic survey results, scheduled and significantly more expensive seismic data acquisition was shifted to more prospective areas. This resulted in the savings of approximately \$400,000.00 in additional exploration expense.