

SS09

Keynote Presentation - The Future of Hydrocarbon Exploration in the Red Sea

M. Zinger, Red Sea Exploration Team Leader* (Saudi Aramco)

SUMMARY

The Red Sea has a reputation for being the graveyard of seismic imaging. Many of the challenges here are similar to such areas as the Gulf of Mexico:

1. Highly Mobile, thick salt sequence
2. Severe Raypath Distortions
3. Deepwater
4. Energy Penetration Issues

But there are also additional factors that make the Red Sea one of the most challenging areas in the world for subsalt imaging:

1. Highly Rugged seafloor bathymetry
2. Thick, layered evaporites
3. Severe Multiple problems
4. Severe structuring within the salt induced by lateral translation of the salt into the rift basin
5. An almost complete absence of deepwater well and velocity control.

Saudi Aramco has embarked on a new strategy to expand exploration to several new and frontier areas as part of a campaign to discover significant new oil and gas resources, beyond the prolific areas of the Eastern Province. One of these frontier areas is the Red Sea. The question then, is whether or not the time for serious hydrocarbon exploration has arrived in the Red Sea?

Saudi Aramco believes that the time to confront these challenges is now right, and this talk will lay the foundation for why this is indeed the case. The technical challenges for sub-salt imaging are significant here, but technologies developed in such areas as the Gulf of Mexico, Egypt, Brazil and many other areas will find significant application in the Red Sea. Wide azimuth 3D acquisition can provide the diverse raypaths for better illumination and multiple attenuation. New and developing technologies such as Full Tensor Gradiometry (FTG) and Marine Magneto-Tellurics (MMT) can help to describe the salt for better velocity models, and new migration algorithms such as Reverse Time Migration can help to unlock puzzles that were beyond our reach only a few short years ago. It will require a careful and coordinated application of many different technologies in unison, and careful integration of all these datasets, but the promise to finally tap the potential of the Red Sea may be within our grasp.