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Gas Exploration & Development in Saudi Arabia

Aramco made in 1957 the first discovery of non-associated gas in the Gulf region when it tested the Permian Khuff reservoir in the Dammam dome. Subsequently in 1971, Khuff gas was discovered in the giant Ghawar structure, and along with discoveries in Berri and Qatif fields, became the foundation for major non-associated gas production by Saudi Aramco.

The expansion in gas-based power generation, seawater desalination, and petrochemical industries increased demand, and in 1994 a program was initiated to explore for additional gas reserves, targeting deep (>10,000 ft) non-associated gas plays, including the Khuff carbonates, Permo-Carboniferous 'Unayzah sandstones, and Devonian Jauf sandstones. This program has been remarkably successful, having drilled a total of 33 wildcat wells resulting in 17 new discoveries with a success rate of about 50%, and added over 48 TCF of non-associated gas reserves. The program included the acquisition of 1,700,000 line/kms of aeromagnetic data, about 110,000 line/kms of 2D seismic data, and more than 82,000 km of 3D seismic data. The program substantially improved our understanding of the regional geology, including Paleozoic stratigraphy, the tectonics of the Hercynian orogeny, and the interplay between tectonics and sedimentation during Unayzah deposition. The newly discovered gas reserves are currently being developed to supply two new gas plants, amounting to 3.2 BCF/D of additional production. The technical challenges we faced, particularly in deep seismic imaging on land, have spawned significant research by us and our partners in industry and academia.