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### *How an Independent is Using 3-D Seismic and CAEX Technology to Reduce Risk*

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Three-dimensional (3-D) seismic and computer-aided exploration (CAEX) is of growing significance in the oil and gas industry. Independent oil and gas firms that correctly implement this technology can earn exceptional rates of return on investment because of substantially reduced finding costs at reduced levels of risk. Advanced technology lowers finding costs by condemning prospects before they are drilled (reducing the number of wells drilled), and improving the finding rate (reserves per well) of successful wells. Also, it reduces the number of wells required to develop a discovery, and locates reserves that otherwise would not have been found because of the inadequacies of 2-D technology.

Until recently, the primary users of 3-D were major companies, and the primary application was the redevelopment of older fields. Texas Meridian Resources Corporation is an example of an independent that uses 3-D and CAEX for all its exploration prospects. Case studies are presented that illustrate how Texas Meridian Resources aggressively uses modern technology to improve economics. An exploration program of onshore prospects is presented that compares costs, success rates, finding rates, etc., for 2-D versus 3-D in order to calculate finding costs per barrel of oil or MCF of gas. While more money is spent initially on the 3-D alternative, this is more than

offset by savings from fewer dry holes. 2-D versus 3-D finding costs are then compared to the selling prices for oil and gas to arrive at a rate of return index for each alternative. Several new field discoveries that resulted from 3-D surveys on onshore wildcat prospects are also illustrated.

The oil and gas industry has been in decline for 14 years as oil and gas prices plunged and the major oil companies withdrew from domestic exploration. 3-D and CAEX technologies are creating new investment opportunities for independent exploration and production companies. ■

#### Biographical Sketch



**Dan L. Smith** is an independent geologist currently working as a consultant to Texas Meridian Resources Corporation. He received the Best Paper

Award from the Division of Professional Affairs for his presentation of this paper at

the 1995 AAPG Annual Convention. Dan received a Bachelor of Science in Geology from the University of Texas in 1958. From 1970 to 1991, he was part-owner, Executive Vice President, and a Director of Texoil Company. Prior to that he was employed for three years as an exploration geologist for an independent firm and for nine years in the same capacity with Amoco. Mr. Smith is active in AAPG, AIPG, SIPES, GCAGS, Houston Geological Society, and numerous other local geological societies. He is a Certified Geologist of both AAPG and AIPG.