Monday, March 12, 2007

Westchase Hilton • 9999 Westheimer
Social Hour 5:30-6:30 p.m.
Dinner 6:30 p.m.

Cost: $28 Preregistered members; $35 non-members & walk-ups

The HGS prefers that you make your reservations on-line through the HGS website at www.hgs.org. If you have no Internet access, you can e-mail reservations@hgs.org, or call the office at 713-463-9476 (include your name, e-mail address, meeting you are attending, phone number and membership ID#).

*by **Michelle Judson***
Technology Unit Leader,
Exploration & Production
Technology, BP

Illuminating Asset Value through New Seismic Technology

Everything We Do Starts With Our Ability to Create an Image...

The ability to reduce risk and uncertainty across the full life cycle of an asset is directly correlated to creating an accurate subsurface image that enhances our understanding of the geology. This presentation focuses on this objective in areas of complex overburden in deepwater. Marine 3D seismic surveys have been acquired in essentially the same way for the past decade. This configuration of towed streamer acquisition, where the boat acquires data in one azimuth has been very effective in imaging areas in fairly benign geologic settings. As the industry has moved into more complicated geologic settings these surveys no longer meet the imaging objectives for risk reduction in exploration through production. In shallow water, we have seen increasing use of ocean bottom cables to meet this challenge. For deep water, new advances in technology were required. Two examples will be highlighted; imaging below large salt bodies in the deep water Gulf of Mexico and imaging below the interbedded anhydrites of the Nile Delta.

The need to mitigate business risks in two very costly subsalt plays led BP to explore the technical limits of the seismic method...

GOM—Mad Dog: The Mad Dog field is located approximately 140 miles south of the Louisiana coastline in the southern Green Canyon area in water depths between 4100 and 6000 feet. The complex salt canopy overlying a large portion of the field results in generally poor seismic data quality. Advanced processing techniques improved the image, but gaps still remained even after several years of effort. We concluded that wide azimuth acquisition was required to better image the field. Results from the Wide Azimuth Towed Streamer (WATS) survey deployed at Mad Dog demonstrated the needed improvement in the subsalt image.

GOM—Atlantis Field: An alternative approach to wide azimuth acquisition, ocean bottom seismic (OBS) node technology was developed and tested. In 2001 deepwater practical experience was limited to a few nodes owned by academic institutions; there were no commercial solutions either available or in development. BP embarked on a program of sea trials designed to both evaluate technologies and subsequently encourage vendor activity to develop and deploy a commercial system.

Nile Delta: In the Nile Delta, Egypt, a relatively thin but complex layer of partially eroded and interbedded anhydrite and salt (the 'Messinian') causes wavefield distortion and shadow zones. Multi-azimuth (MAZ) surveys were proposed based on the encouraging results from a dual azimuth field trial in 2003. A very efficient six azimuth survey acquired in late 2004 proved highly effective as an appraisal tool.

The 3D seismic method exploded into general usage in the 1990's. Our industry delivered 3D cheaper and faster, improving quality through improved acquisition specifications and new processing technology. The need to mitigate business risks in two very costly subsalt plays led BP to explore the technical limits of the seismic method, testing novel acquisition techniques to improve illumination and signal to noise ratio. These were successful and are applicable to analogue seismic quality problems globally providing advancements in illuminating previously hidden geology and hydrocarbon reservoirs.

A focused business challenge, smart risk taking, investment in people and computing capability, partnerships and rapid implementation are key successful business practices that will be touched on throughout the talk. ■

Biographical Sketch

Michelle Judson, Technology Unit Leader—Geosciences, BP America Inc.

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Michelle's current role is Technology Unit Leader—Geosciences for BP's Exploration and Production (E&P) division. In this capacity she leads a global team of technical experts who develop, deliver and apply geosciences technological solutions to business units worldwide. Prior to her current role she was the program director for the Subsalt Imaging Technology Leadership Area, responsible for setting strategic direction and assuring program delivery.

Before moving to Technology she was the performance unit leader for BP Canada Energy Company's exploration program in western Canada. In addition to her line responsibilities, she was responsible for the functional health of the subsurface segment of the organization, and played a role in building community and stakeholder relationships.

Michelle has a broad range of experience in the international exploration and production business as well as in business planning and development. From 1999–2001 she was a co-leader of the MCBU Innovation Project focusing on unlocking greater organizational performance. She has held various subsurface technical, leadership and commercial roles in the Lower 48 and Deep Water Gulf of Mexico. Michelle has also worked overseas in Scotland, England and Azerbaijan.

Michelle started her career as an operations geologist for Sohio Petroleum Co. on the North Slope of Alaska. She holds a B.Sc. in Geology from St. Lawrence University, and an M Sc. in Geology from the University of South Carolina.

Michelle currently lives in Houston with her Husband Dr. G. Barry Hembree, a violin maker. She has two stepchildren Ryan (a student) and Bridget (an architect). Her passions outside of work include sailboat racing, travel, pottery, education, friends and family.