Tuesday, April 18, 2006

Westchase Hilton • 9999 Westheimer
Social 11:30 a.m., Lunch 11:45 a.m.

Cost: $25 for members with advance reservations, $30 for walk-ins, space available, ($13.50 for Emeritus and Honorary).

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#).

Joint GSH/HGS Luncheon Meeting

by ***Rebecca Latimer***
Chevron Energy Technology Company
Houston

Uses, Abuses and Examples of Seismic-Derived Acoustic Impedance Data: What Does the Interpreter Need to Know?

Throughout the years there has been a concerted effort to integrate the geoscience disciplines to become more adept at understanding the petroleum potential of an area. In the 1980s, geophysicists interpreted 2D seismic data by overlaying log data on paper seismic sections and using generalized depth-to-time curves to determine which events represented markers on the logs. Geologists interpreted cross-sections by drawing straight lines between wells to represent their correlations. Because technology advances have changed the process, many people today have become "interpreters" of 2D or 3D data on workstations where the log data, seismic data and many derivations of the seismic data (attributes, coherence, P impedance, inversions, elastic impedance, lambda rho, etc.) are available to fine-tune the analysis process. The question, however, still remains: Are we integrating the data yet?

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Inversion of seismic data into acoustic impedance provides a natural tie to the log impedance data and forces the geoscientist, in analyzing seismic data, to extract appropriate wavelets, determine the phase and amplitude of the data, determine whether or not the phase is stable throughout the volume and very intimately tie the well log impedance data to the seismic data. Utilizing inverted data at the beginning of the interpretation process requires that the geoscientist understand the rock properties in the target area before embarking on an "attribute" interpretation. Even when the P impedance data do not clearly distinguish between fluids or lithologies, value is added by using these data as the first interpretation tool. The simplicity in knowing that the change of values represents a change in rock properties without the complexity of wavelet variability is a distinct advantage to the interpreter. This initial process is critical to undertaking any interpretation of seismic data. Seismic data, being an interface property, contain tuning, side lobe effects, and phase and frequency variability, making it difficult to directly determine the geology. Inverted data, layer properties, are a more intuitive geologic tool that allows interpreters to utilize their natural ability to "see" the geology in the seismic data.

Today, advanced impedance tools use angle-stack data and shear log components that can aid in distinguishing between lithologies and hydrocarbon properties. These data combine the benefits of angle data, AVO, and rock properties, which—when analyzed together with an understanding of the depositional environments, stratigraphic concepts, and the myriad of seismic attributes—can greatly increase the interpretative ability of the geoscientist.

This presentation will demonstrate the necessity for inversion and explain why it is beneficial in an interpretation workflow. It will examine both the strengths and drawbacks of using inverted data as compared with the seismic data and the original rock data. It will also show

- how scale differences between various data types can affect the results,
- how the interpreter analyzes the rock properties and utilizes these with inverted data, and
- how to spot pitfalls in the overuse of impedance data. ■

Biographical Sketch

Rebecca Buxton Latimer is team leader for Chevron's Energy Technology deepwater stratigraphy team in Houston, Texas. She received an MS in geology/geophysics from Boston College in 1980 and has been in the oil industry for 26 years.

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Ms Latimer started her career with Amoco in New Orleans in 1980. In 1986, she moved to Houston with Amoco and worked as an interpreter and sequence stratigrapher in a series of basin-modeling groups. In 1989 she moved to Stavanger, Norway, where she worked as a sequence stratigrapher for Enterprise Oil. After leaving Amoco in 1992, she worked for five years as an inversion/geostatistics specialist and Chief Geoscientist with Jason Geosystems in Houston.

Ms Latimer joined Texaco's Upstream Technology Group in 2000, doing work in seismic inversion and geostatistics. After the merger of Chevron and Texaco, she became a team leader in ChevronTexaco's Energy Technology Company, supporting the business units, worldwide. She is also an editor for the SEG's *Leading Edge* magazine.