



Thursday, 22 January 2009

SALA BARBARA

5° Palazzo Uffici - Eni E&P division

Via Emilia 1

SAN DONATO MILANESE

11:00

2008-2009 SPE Distinguished Lectures Series

**OPTIMIZING ASSET DESIGN - CRADLE TO GRAVE - BY BRIDGING  
THE GAP BETWEEN THE EARTH SCIENCE  
& ENGINEERING DISCIPLINES USING  
MECHANICAL EARTH MODELING TECHNOLOGY**  
*By Harvey E. Goodman– Chevron*

➤ **ABSTRACT**

As the geological and geophysical modeling work of the Explorationists matures, and the subsurface picture becomes clearer, well systems design optimization is being achieved by Well Engineers using Mechanical Earth Model technology. Since the early 1990's, Chevron has maintained the strategy of using acoustics based measurements to characterize formation mechanical properties and in-situ stress magnitude and orientation. The strategy was critical to present-day capability to create Mechanical Earth Models (MEM) that contain elastic moduli information (with static equivalents) and formation strength from seismic data volumes. The capability to create rock mechanical properties from the standard P-wave 3D seismic grid enables well planners to characterize pre-drill location safe drilling mud weight windows and to forecast drill bit performance through the overburden, i.e. rate of penetration and bit life. Furthermore, a mature MEM formation property data set focused on the reservoir can be used to predict seismic attributes that correspond to fluid saturation. Chevron now applies this technology within its business units world-wide for *bit optimization & performance prediction, wellbore stability, sand prediction, fracture stimulation design, cuttings disposal design and seismic reservoir characterization for by-passed oil*. The presentation will introduce acoustics based rock mechanics concepts, describe Chevron's acoustics based rock property prediction technique, and present field application case histories for selected business units world-wide, including deepwater GOM, North Sea, offshore West Africa and Asia.

➤ **BIOGRAPHY**

*Harvey E. Goodman is a Staff Research Consultant working at Chevron's Energy Technology Company in Houston. He was appointed Chevron Fellow by David J. O'Reilly, Chevron Chairman and Chief Executive Officer, October 23, 2007. His key technical responsibilities include rock mechanics technology development and the application of geomechanics to well design using the common earth model approach. He is a recipient of the Chevron Chairman's Award, the company's highest technical achievement award for work in geomechanics. He was an SPE Distinguished Lecturer for 2004 – 2005 and is the current JPT editor for Wellbore Integrity, Sand Management and Frac Pack. He is an adjunct Professor at the University of Missouri – Rolla (UMR), lecturing in the new Mechanical Earth Model (MEM) Petroleum Engineering degree program. In 2007, he was awarded an honorary Professional Degree in Petroleum Engineering by UMR, where he also holds B.S. and M.S. degrees in Geological Engineering.*