PETROLEUM ENGINEERING
COLORADO SCHOOL OF MINES

Distinguished Seminar Series

Gas Hydrate Petroleum System Analysis in Marine and Arctic Permafrost Environments

Dr. Timothy S. Collett
U.S. Geological Survey

Tuesday, March 14th
Time: 4:00 pm
Marquez Hall 204

ABSTRACT The study of gas hydrates in nature has been ongoing for over 40 years. Significant strides have been made in our understanding of the occurrence, distribution, and characteristics of marine and permafrost associated gas hydrates. Numerous field studies have shown that the potential amount of gas stored as gas hydrates in the world greatly exceeds the volume of known conventional gas resources. Gas hydrate research in recent years has focused on: (1) documenting the geologic parameters that control the occurrence and stability of gas hydrates in nature, (2) assessing the volume of natural gas stored within various gas hydrate accumulations, (3) analyzing the production response and related characteristics of gas hydrates, (4) identifying and predicting natural and induced environmental and climate impacts of natural gas hydrates, and (5) analyzing the effects of gas hydrate on drilling safety.

The concept of a gas hydrate petroleum system, as a subcomponent of a conventional oil and gas petroleum system is now commonly used to describe and assess the geologic nature of newly discovered gas hydrate accumulations. In a gas hydrate petroleum system, the individual factors contributing to the formation of gas hydrate accumulations, such as (1) gas hydrate pressure-temperature stability conditions, (2) gas source, (3) gas migration, and (4) the growth of the gas hydrate in suitable host sediment can be identified and quantified.

The primary goal of this lecture is to bring together the knowledge from both marine- and permafrost-related gas hydrate studies in order to document the critical components of various example gas hydrate petroleum systems. This lecture reviews the results of field, laboratory, and modeling studies to better document and assess the geologic controls on the formation and occurrence of gas hydrates in nature and their resource potential.

Bio **Dr. Timothy Collett** is chief for the USGS Energy Resources Program gas hydrate research efforts and an adjunct professor for the Department of Geophysics at the Colorado School of Mines. Collett, an award-winning AAPG member, has been with the USGS since 1983 and has been the chief and co-chief scientist for numerous domestic and international gas hydrate scientific and industrial drilling expeditions and programs, including the India NGHP Expedition 01 and 02 gas hydrate drilling and testing projects. His current research efforts deal mostly with domestic and international gas hydrate energy resource characterization studies. His ongoing gas hydrate assessment activities in Alaska are focused on assessing the energy resource potential of gas hydrates on the North Slope and supporting the domestic marine gas hydrate assessments being led by the U.S. Bureau of Ocean Energy Management.