

## INTERNATIONAL EXPLORATIONISTS

**HGS INTERNATIONAL GROUP  
DINNER MEETING—APRIL 19, 1993**  
Post Oak Doubletree Inn  
Social hour, 5:30 p.m., Dinner, 6:30 p.m.  
Technical Presentation, 7:30 p.m.  
Authors: L. F. TYSHENKO, B. L. RYBYAKOV,  
K. L. TALLEY (speaker)

KEITH TALLEY—Biographical Sketch



Keith received a B.S. from Humboldt State University in Geology and Oceanography, and an M.S. in Petrology from SMU in 1975. He has worked for Exxon, Mobil, GSI, Sohio (BP) and is currently a consultant to Pluspetrol International concentrating on Russia, China, the Far East and Australia. His career has involved both minerals and petroleum exploration and he has experience in the

Western U.S., Alaska and the Gulf of Mexico, Mexico and the U.S.S.R., having lived in several foreign locations while performing his exploration function.

### PRE-CAMBRIAN-LOWER CAMBRIAN GEOLOGY AND HYDROCARBON OCCURRENCES OF THE SOUTHERN PORTION OF THE EAST SIBERIAN PLATFORM

The present day structure, geology and hydrocarbon occurrences of the southern portion of the East Siberian Platform are the result of complex, long-term geological processes. From a regional point of view, the southern portion of the platform is an asymmetric basin controlled by block faulting of the Archean to Proterozoic-age crystalline basement rocks. This basin, called the Irkutsk Amphitheatre, is filled by a thick complex of sedimentary deposits ranging from Upper Riphean to Jurassic in age. The basin is bounded on the southwest by the East Sayan Folded Belt and on the southeast by the Baikal-Patom Uplands. Total thickness of the sedimentary cover ranges from two kilometers over the Nepa Arch to seven and one half kilometers in the Pre-Sayan-Yenisey Depression.

Pre-Cambrian-Lower Cambrian sedimentary deposits are sub-divided into four stages: the Riphean complex, the subsalt complex, the salt complex, and the post-salt complex. Data acquired from over 700 wells have proven that four regional oil and gas bearing horizons are present in the sedimentary cover: Riphean-age carbonates and clastics, Vendian-Lower Cambrian siliciclastics, Lower Cambrian-

age clastics, and Lower Cambrian-age pre-salt carbonates. A very effective regional seal is provided by thick Lower to Middle Cambrian-age evaporites, part of the East Siberian Salt Basin, which is the largest salt accumulation in the world. The post-salt sedimentary section consists of Upper Cambrian to Jurassic clastics and volcanics and is non-prospective for hydrocarbons.

The Irkutsk Amphitheatre is part of the greater Lena-Tunguska Petroleum Province, and is divided into four petroleum sub-provinces: the Pri-Sayan/Yenisey Depression, the Lena-Angara Terrace, the Nepa-Botuobin Arch, and the Pri-Baikal/Patom Marginal Trough.

The Pri-Sayan/Yenisey Depression petroleum sub-province has hydrocarbons present in Lower Cambrian sub-salt clastic reservoirs, with key areas being the Lysk-Udinsk and Angarsk paleohighs. The region is relatively unexplored. The Lena-Angara Terrace sub-province has very large deposits of gas and condensate associated with Vendian/Lower Cambrian siliciclastic reservoirs. The key field in the region in the Koviktinskoye gas/condensate deposit with very large proven recoverable reserves. Exploration potential is high in this area. The Nepa-Botuobin Arch sub-province includes the Nepa Paleohigh, a regional basement high since pre-Cambrian times. The main hydrocarbon reservoirs are also Vendian/Lower Cambrian siliciclastics which pinch out against the flanks of the paleohigh. This sub-province contains all the major oil deposits of the region, including the giant Verkhne-Chonskaya oil field. In the central part of this paleohigh, where siliciclastic reservoirs are absent, oil is present throughout the pre-salt carbonate horizons of the Osinsky, Ust-Kut, and Preobrezhensky formations. The PriBaikal/Patom sub-province is located along the margin of the East Siberian Platform. Here, sub-salt terrigenous complexes have been the main targets for hydrocarbon exploration, although to date, little exploration has been carried out.

Information gained over the last 50 years on the geology of the southern East Siberian Platform has resulted in the discovery of significant pre-Cambrian and Lower Cambrian hydrocarbon deposits. In the past, much skepticism has been voiced about the possibility of such old hydrocarbon occurrences actually existing. Today, over 700 wells have found 15 hydrocarbon fields in these reservoirs, including the world class supergiants of Verkhne-Chonskaya, Koviktinskoye, and Yurubcheno-Tokhomo. These fields are undeveloped and provide a considerable resource potential for the development of the oil and gas industry of the Irkutsk region.