



Dr. V. K. Rao

Is currently the Senior Vice-President & OSD (E&P / Gas Business), Reliance Natural Resources Limited, India. He holds Ph.D. in Geology and has more than four decades of experience in the Oil & Gas Upstream sector. He has served at ONGC, DGH, GAIL & REL. He is a Board Member of American Biographical Institute, Raleigh, USA; Board Member of Research Council, Andhra University, Waltair; Editorial Advisor to Oil & Maritime Journal and Listed Biography in "Reference Asia Book" and "Indo-France Directory of Scholars". He has been on several overseas assignments to France, USA, Russia, China, Australia, Canada, Singapore and Yemen.

Shri B. S. Negi

Is a Post Graduate in Mechanical Engineering with Honours and Post Graduate in Project Management. He is a Chartered Engineer and the Fellow of Indian Institute of Mechanical Engineering. He has 41 years of experience in the areas of Oil Refining, Fertilizers, Gas Processing, Transportation, E&P and Gas Sourcing. He has been associated with import of LNG to India from Qatar, Iran, Algeria, Yemen, Australia etc. After superannuating from GAIL (India) Limited as its Director (Business Development), he has been appointed by the Government of India as a Member of the first Oil & Gas Sector Regulatory Board (PNGRB) in 2007. He has authored two books on 'LNG - An Indian Scenario' and 'LNG - An Emerging Global Market'.



Shri P. K. Bhowmick

Is Executive Director – HOI - KDMIPE, ONGC, Dehradun, & has an illustrious career spanning over 34 years of working in the Upstream sector of hydrocarbons, both as a development and an exploration geologist. He has been instrumental in being associated with a few of ONGC's discoveries and field extensions. He is also responsible for identification of new play type. He is the President of Association of Petroleum Geologists, President of ONGC Himalayan Association, an active member of the American Association of Petroleum Geologists and a member of Research Council of NGRI, Hyderabad.



Dr. G. P. Karmakar

Is presently the Director, School of Petroleum Technology, Pandit Deendayal Petroleum University, Gandhinagar, India. He completed his post-graduation in Petroleum Refining and Petrochemical Engineering from Institute of Petroleum and Gas, Ploiesti, Romania; M.Tech. in Petroleum Engineering from Indian School of Mines, Dhanbad and Ph.D. from Indian Institute of Technology, Kharagpur, India. He did his post-doctoral research at FSU, Jena, Germany, at Royal School of Mines; Imperial College, London and at FHL, Senftenberg, Germany.



Dr. Anirbid Sircar

Is a Geophysics Post-graduate from Indian Institute of Technology, Kharagpur. He obtained his M.Tech in Petroleum Exploration and Ph.D. in Seismic Tomography from Indian School of Mines, Dhanbad. He has fifteen years of experience in the Petroleum Industry. Presently he is working as an Associate Professor in School of Petroleum Technology, Pandit Deendayal Petroleum University, Gandhinagar. His area of interest is reservoir mapping and characterization.



A. M. Dayal

Is an isotope geologist who has set up the Geochronology Lab at National Geophysical Research Institute, Hyderabad. He worked on lamprophyre and kimberlite for their age and source characteristics. Presently, he is the Head of stable isotope and surface geochemical prospecting of hydrocarbon research group and discovered presence of hydrocarbons in Proterozoic basins. A.M.Dayal has received DAAD Fellowship from DST and INSA Fellowship for Royal Society of London.



Pandit Deendayal Petroleum University, India

Pandit Deendayal Petroleum University, established in 2007 is a research-led university based in the vibrant city of Gandhinagar in Gujarat. Spread over a campus extending over 100 acres in the Educational Zone. PDPU is promoted by Gujarat State Petroleum Corporation (GSPC) and established by an act of Gujarat State Legislature. The University is recognized by the University Grants Commission (UGC). Today, PDPU is widely recognized as a centre of excellence in energy education, quality research and for its strong industry interface. The university has over 1800 students on campus. The University is recognized as Scientific & Industrial Research Organization by Department of Scientific & Industrial Research, Ministry of Science & Technology, Government of India.

The objective is to create a world class university in energy education and research with special focus on entire energy sector. The University addresses the need for trained and specialized human resources for the Energy and Infrastructure industry worldwide. It intends to expand the opportunities for students and professionals to develop intellectual knowledge with leadership skills and offer well-planned undergraduate, post graduate, doctoral programmes and intensive research initiatives. PDPU also aims to function as a leading resource centre for knowledge management and entrepreneurship development in the areas of science, technology, management and humanities.



Mewbourne School of Petroleum and Geological Engineering (MPGE), The University of Oklahoma, USA

The University of Oklahoma is a co-educational public research university located in Norman, Oklahoma. Founded in 1890, it existed in Oklahoma near the Indian Territory for 17 years before the two became the State of Oklahoma. As of 2007, the university had 29,931 students enrolled, most located at its main campus in Norman. Employing nearly 3,000 faculty members, the school offers 152 Baccalaureate programmes, 160 Master's programmes, 75 Doctorate programmes, and 20 majors at the first professional level.

Mewbourne School of Petroleum and Geological Engineering of the University of Oklahoma, provides undergraduate and graduate students with educational experiences that allow them the opportunities to develop technical competence and the intellectual perspective to function effectively in and continue professional growth during their careers. These educational experiences occur primarily through innovative classroom instruction, laboratory experiences, student mentoring and individual research at the graduate level.



INDO-US Science and Technology Forum

The Indo-U.S. Science and Technology Forum (IUSSTF) was established in 2000 under an agreement between the Government of India and United States of America with a mandate to promote, catalyse and seed bilateral collaboration in science, technology, engineering and biomedical research through substantive interaction amongst government, academia and industry. IUSSTF provides an enabling platform to the scientific enterprises of the two nations by supporting the S&T program portfolio that is expected to foster sustainable interactions with a potential to forge long term collaborations. IUSSTF program manifests are largely catalytic in nature that helps to create awareness through exchange and dissemination of information and opportunities in promoting bilateral scientific and technological cooperation.

IUSSTF has an evolving program portfolio that is largely conceived and driven by scientific communities of both the countries through extending support for symposia, workshops, conferences on topical and thematic areas of interest; visiting professorships and exchange programs; travel grants; fellowships; advanced training schools; public-private networked centres and knowledge R & D networked centres. IUSSTF also works towards nurturing contacts between young and mid career scientists by convening stimulating flagship events like the Frontiers of Science and Frontiers of Engineering symposium through the US National Academies model. IUSSTF reaches out to industries by partnering with business associations to generate high quality events on technology opportunities for business development to foster elements of innovation and enterprise through networking between academia and industry.

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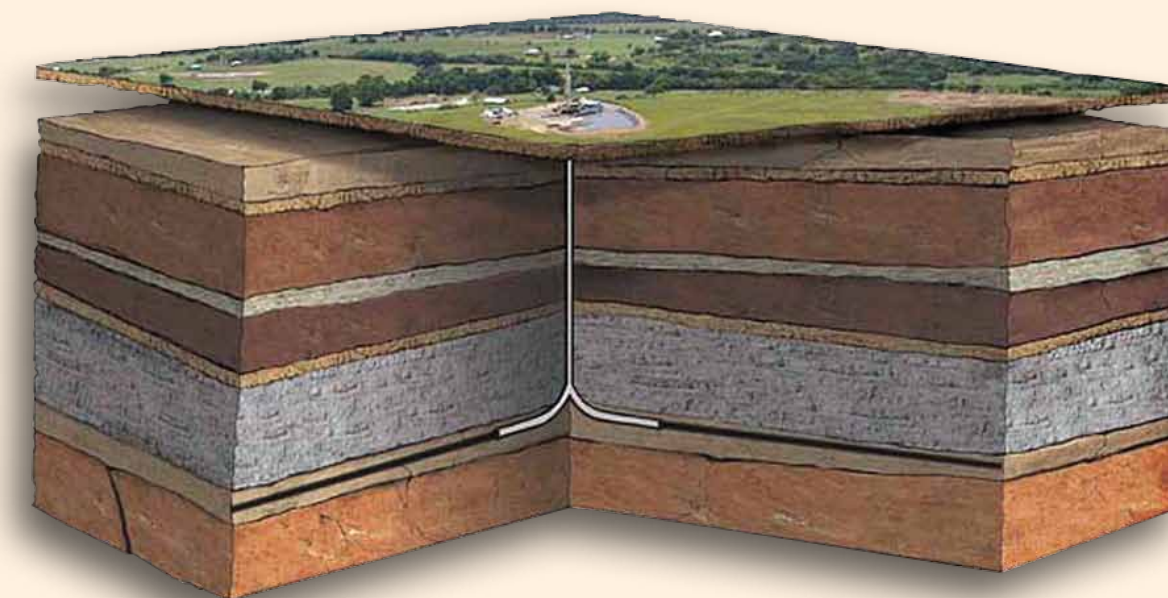
**PANDIT DEENDAYAL
PETROLEUM UNIVERSITY**



**MPGE,
The University of Oklahoma**

India - US Bilateral Conference on SHALE GAS A Global Energy Alternative

Date : 19th - 20th March, 2012
Venue : ITC Maurya, New Delhi, India.



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CONFERENCE ON SHALE GAS

Pandit Deendayal Petroleum University (PDPU) and The University of Oklahoma (OU) has organised a two day India - US Bilateral conference on Shale Gas in March 2012. An Orientation workshop on Shale Gas was jointly organized by PDPU & OU in January 2011 which brainstormed on Indian Shale Gas players, Prospects & Challenges. The forthcoming India - US Bilateral Conference on Shale Gas in March 2012, will specify play areas, technology transfer from US to India, government regulatory policies and prices, environmental issues related to Shale Gas exploitation and a roadmap will be prepared for Shale Gas Centre of Excellence at PDPU Campus, Gandhinagar.



CONFERENCE THEME

The two day conference will project how Shale gas can play a significant role in meeting global energy demands. It will provide fundamentals of US and Indian scenario in terms of Shale Gas, technology available, environmental issues related to its extraction and structural changes needed to make India's energy markets responsive to the deployment of new technologies.

SHALE GAS - An Overview

Shale gas belongs to the category of unconventional reservoirs which includes coal bed methane, gas from tight sandstones and gas hydrates. Shale is a fine grain sedimentary rock formation which contains clay, quartz and other minerals.

Apart from the United States and few other countries, shale gas resource, although believed to be both large and widespread, have not been quantified on a national basis for most countries. The global shale gas resource endowment is about 16,110 TCF or 456 TCM, compared to 187 TCM for conventional gas. It is assumed that nearly 40% of this endowment would be economically recoverable.

Until recently, the shale gas focus was mainly on North America, but today the interest towards shale gas is spreading around the world. Three European basins are worth mentioning namely, Alum Shale in Sweden, the Silurian Shale in Poland and Mikulov Shale in Austria. In US, there was a sharp change in US Shale Gas reserve estimate. Dry shale gas production in US has increased from 1.0 TCF in 2006 to 4.8 TCF in 2010 while wet shale gas has increased to 60.64 TCF by the year-end 2009.

According to geologists, there are more than 668 shales worldwide in 142 basins. At present, only a few dozen of these shales have known production potentials, most of those are in North America. This means that there are literally hundreds of shale formations worldwide that could produce natural gas. The potential volumes of shale gas are thought to be enormous and this is likely to change the natural gas markets worldwide.

India has very little domestic gas production, and almost all of it is based on young rock in the offshore. In India, shale gas will be primarily targeted at Cambay basin, Assam-Arakan basin, Damodar Valley, KG basin and Cauvery basin. In Karanpur, at Raniganj, ONGC has drilled first well out of the four wells planned. The initial results

Background, Concept and Purpose

As elaborated above, shale gas play in India is an important domain, but the knowledge base in India is in nascent stage. An effective government policy framework is required for the shale gas blocks to be explored and exploited. PDPU has signed a memorandum of understanding with the University of Oklahoma to promote education and research on shale gas.

A memorandum of understanding is entered by and between:

- Mewbourne School of Petroleum and Geological Engineering, University of Oklahoma – a non-profit Oklahoma Education Institute with a registered address at 100, E-Boyd Street, Norman, Oklahoma.
- Pandit Deendayal Petroleum University - Established by the Pandit Deendayal Petroleum University Act, 2007; Acts of

are encouraging but one has to wait for some more time to ascertain whether shale gas production is commercially viable or not. According to Schlumberger who is hired by ONGC, Shale Gas reserves in India would be anywhere between 600 TCF to 2000 TCF. Realizing the huge potential of shale gas, the Government of India is likely to offer shale gas exploration for the first time. The first two-day workshop on shale gas was jointly held by Pandit Deendayal Petroleum University (PDPU) and The University of Oklahoma (OU) in January 2011. The second India - US Conference on shale gas in March 2012 will focus on play areas, technology transfer from US to India, government regulatory policies and prices. Environmental issues will be discussed in detail and a white paper will be brought out.

In Cambay basin, huge thickness of shale ranging from 400 to 1000 meter can be a good target. The Cambay shale is divided into Upper Cambay shale and Lower Cambay shale and both have potential to produce shale gas. In Cambay shale, the average clay percentage is 38% and quartz percentage is 35%. The kerogen is of type III, and the high TOC value 1.5-4% and maturity between 0.9-1.0 at 800 meter depth. Oil India has also planned a project to drill two wells in Assam-Arakan basin at a cost of USD 25 Million. In the proposed workshop a platform will be created to use the experience of US to understand and exploit shale gas plays in India.



the Gujarat Legislature and Ordinances promulgated and Regulations made by the Governor of Gujarat, India located at Raisan, Gandhinagar - 382 007.

- The memorandum of understanding expresses mutual interest among parties to promote education and research on shale gas.
- The creation of a centre of research on shale gas is to advance the mutual objectives of parties and to take the advantage of their complementary strength.
- The development of collaborations with industries to promote shale gas and train human resource to use appropriate technology.
- Work together to develop the viable and sustainable model for funding of the research and education effort, which may include support of the centre, and of research projects in areas of interest to the parties related to shale gas.

Need for a bilateral event

In order to expedite the development of shale gas, Directorate General of Hydrocarbons (DGH) is framing a policy on shale gas and identification of blocks for development of shale gas. It is relatively easy to discover shale gas but possibly difficult to develop. There is no doubt that US is far advanced in development of shale gas exploration and exploitation.

The advantage of US expertise should be taken to reduce the time for development from 10-12 years to 5-6 years.

This bilateral conference will address issues related to policies/ regulations, investments, and technologies that may reduce the cycle time for shale gas development.

Key Speakers



Dr. Chandra S. Rai

Is presently the Director and Eberly Chair, MPGE, Norman, OK, USA. He obtained his B.S. and M.S. in Applied Geophysics from Indian School of Mines, Dhanbad, India. He obtained his Ph.D. in Geology and Geophysics from University of Hawaii, Honolulu, Hawaii. His research interests are Rock and Mineral Physics, Reservoir Characterization and Petrophysics.

Dr. Subhash Shah

Is presently the Stephenson Chair Professor, MPGE Norman, OK, USA. He obtained his B.S. in Chemical Engineering from University of Baroda, India, and M.S. in Chemical Engineering from University of New Mexico, Albuquerque. He obtained his Ph.D. in Chemical Engineering from University of New Mexico, Albuquerque. His research interests are Drilling and Well Completions, Stimulation, Coiled Tubing Applications and Non-Newtonian Fluids Characterization.



Dr. Carl H. Sondergeld

Is presently the Mewbourne Chair Professor, MPGE Norman, OK, USA. He obtained his B.A. and M.A. in Geology from Queens College, CUNY, New York. He obtained his Ph.D. in Geophysics from Cornell University, Ithaca. His research interests are Rock Mechanics, Acoustic Emissions and Rock Physics.

Dr. Deepak Devegowda

Is an Assistant Professor, MPGE Norman, OK, USA. He obtained his B.Tech. in Electrical Engineering from Indian Institute of Technology and M.S. in Petroleum Engineering from Texas A&M University. He obtained his Ph.D. in Petroleum Engineering from Texas A&M University. His research interests are Reservoir Characterization & Uncertainty Assessment, Geostatistics and Unconventional Oil & Gas Reservoir Engineering.



Dr. W. John Lee

Is best known for his recent publications and presentations on oil and gas reserves, regulations and estimation, and production forecasting in unconventional gas reservoirs. He is the author of three textbooks published by SPE and has received numerous awards from SPE, including the Lucas Medal, the De Golyer Distinguished Service Medal and Honorary Membership. Currently, he is Professor of Petroleum Engineering and holder of the Cullen Distinguished University Chair at The University of Houston. He obtained his B.S., M.S. and Ph.D. Degrees in Chemical Engineering from Georgia Institute of Technology.

Dr. Ramanan Krishnamoorti

Is Dow Professor & Chair of Chemical & Biomolecular Engineering at University of Houston, USA. Professor Krishnamoorti has developed a strong research program in the area of applying developments in nanotechnology to oil and gas exploration and production. The author of numerous publications and recipient of many honors and awards, his work has been described as "defying traditional methods of production". He explores ways in which new materials can improve existing products, leading on nominator to state. He exemplifies excellence in research and teaching in the area of polymeric materials. He holds a Ph.D. in Chemical Engineering from Princeton University.

