

2008–09 SPE Distinguished Lecturer Program

Featuring 29 speakers from various disciplines and professions, the 2008–09 Distinguished Lecturer Program emphasizes current industry trends, challenges, and technology through diverse topics such as reservoir management, artificial lift, hydraulic fracturing, and cementing. Topics and speakers featured in this year's Distinguished Lecturer Program include the following.

Reservoir Management and the Art of Listening To the Reservoir



This presentation focuses on practical aspects of effective reservoir management. To optimally develop a reservoir and maximize its economic value, the right reservoir insight must be developed and used to make the field-development decisions. Developing methods to decode reservoir language into a recognizable language is a key factor and is

the theme of this presentation, which will be illustrated by field examples.

Fahed A. Al-Ajmi is General Supervisor of Khurais Reservoir Management Division for Saudi Aramco. He earned a PhD degree from Texas A&M University and an MS degree from the University of Southern California, both in petroleum engineering.

Cutoffs in Gas Reservoirs and Their Implications in Reservoir Simulation



There is great confusion over the implementation of cutoffs in industry because of the absence of clear-cut agreed-upon values among geologists, production, and reservoir simulation engineers. Cutoffs are limiting values for petrophysical properties aiming to define productive zones across the reservoir for development.

A.A. Al-Hamad is Supervisor of the Gas Area Studies Unit in the Reservoir Simulation Division, Reservoir Description and Simulation Department for Saudi Aramco. He earned a BS degree from King Fahd University of Petroleum and Minerals and MS and PhD degrees from the University of Texas at Austin, all in petroleum engineering.

Pitfalls To Avoid in Assessing Artificial Lift Run-Life Performance



This presentation discusses how to avoid pitfalls in assessing artificial lift run-life performance based on concrete examples to help operators and service companies better understand the issues and be in a better position to select the best run-life measures for their particular situation in both onshore and offshore applications.

Francisco Alhanati is Director E&P at C-FER Technologies. He earned a BS degree in civil engineering from Instituto Militar de Engenharia, an MS degree in mechanical engineering from the Universidade Federal do Rio de Janeiro, and a PhD degree in petroleum engineering from the University of Tulsa.

Low-Cost Methods for Improved Oil and Gas Recovery



It is usually assumed that improvement of oil and gas recovery is a costly proposition. However, several relatively low-cost, improved oil and gas recovery processes have been studied and tested in the field. This lecture presents three such improved oil and gas processes.

Zaki Bassiouni is Dean of the College of Engineering at Louisiana State University. He earned a BS degree in petroleum engineering from Cairo University, a diploma in geophysics from the Ecole Nationale Supérieure de Pétrole et des Moteurs of Paris, France, and MS and PhD degrees from the University of Lille, France.

Injectivity Impairment and Well and Water Management



This lecture presents several field cases of the injectivity damage mitigation and consequent well and water management strategies: water treatment for seawater flooding and produced water re-injection, disposal of produced water in aquifers, waterflood design accounting for injectivity impairment for new fields, raw-water injection, subsurface separation, injectivity with heavy oils and low consolidated sands, applications of horizontal, perforated, gravel-packed and fractured wells.

Pavel Bedrikovetsky is chairperson–petroleum at Adelaide University. He holds an MS degree in applied mathematics, a PhD degree in fluid mechanics, and a DS degree in reservoir engineering from Moscow Oil–Gas Gubkin University.

The Enhanced Oil Recovery Kiss of Death—It Was a Technical Success but an Economic Failure!



How the business risks/issues of CO₂ enhanced oil recovery (EOR) project are handled can make or break a project. Understanding such risks and the measures businesses must take to quantify and minimize them will go a long way to ensure a project is both a technical and an economic success.

Ken R. Brown is Manager of the Carbon and Energy Management Group at the Alberta Research Council. He is a professional engineer with 36 years of experience in reservoir engineering, project management, production engineering, operations engineering, facilities engineering, environmental engineering, and all aspects of technical management of large multi-disciplinary teams.

Improving Drilling Performance by Applying Advanced Dynamics Models



Drilling dynamics models play an important role in drilling performance optimization. These models can be classified as engineering tools or research tools, depending on functionality. Case studies from disparate drilling applications around the world have demonstrated that performance can be improved by applying lessons learned from advanced dynamics models.

Mark Dykstra is Product Development Manager for Hughes Christensen. His group is responsible for developing rolling and fixed cutter drilling products including tricone bits, polycrystalline diamond compact bits, natural diamond bits, impregnated bits, eccentric reamers, expandable reamers, and casing drilling bits. Dykstra earned BS, MS, and PhD degrees in petroleum engineering from the University of Tulsa.

The Scarab/Saffron Fields Deepwater Gas Fields Development: Installation Aspects and Subsea System



The technical challenges of designing a subsea system are to design a system that can manage the multiphase flow, distribute chemicals to the wells, and control production and yet be installed and maintained at a depth beyond diver depths. This lecture presents the lessons learned and the areas for improvement in similar tiebacks. Some of the lessons

learned require immediate modification to the system, others, yet to be captured in similar installations.

Wael F. Ellaithy is Planning General Manager for Agiba Petroleum. He is a mechanical engineer with more than 30 years of experience in the project management of onshore and offshore shallow-water and deepwater oil and gas field development.

Perforating With Lasers: Are You Ready for the Power of Light?



New breakthroughs in laser technology have addressed efficiency, portability, and reliability issues required for successful commercial field applications. The latest multimode configuration of fiber lasers are now capable of delivering multiple kilowatts of power from an efficient, compact laser source with excellent beam quality, reliability, and long life. They represent an enabling technology that opens the door for near-term subsurface laser applications at remote sites.

Brian C. Gahan is President of Laser Rock Technologies. He earned a BS degree in petroleum engineering from Marietta College, an MS degree in chemical engineering from Illinois Institute of Technology, and an MBA degree in finance from the University of Pittsburgh. Gahan is a registered professional engineer and has authored and coauthored several papers and technical publications.

Optimizing Asset Design—Cradle To Grave—by Bridging the Gap Between the Earth Science and Engineering Disciplines Using Mechanical Earth-Modeling Technology



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. This lecture introduces acoustics-based rock mechanics concepts, describes Chevron's acoustics-based rock property prediction technique, and presents field application case histories for selected business units worldwide, including deepwater Gulf of Mexico, North Sea, offshore West Africa, and Asia.

Harvey E. Goodman is a staff research consultant for Chevron's Energy Technology Company. He was appointed Chevron Fellow in October 2007. Goodman is an adjunct professor at the University of Missouri–Rolla (UMR). He was awarded an honorary professional degree in petroleum engineering by UMR, where he also earned BS and MS degrees in geological engineering.

Designing The Perfect Drilling Fluid Additive: Can It Be Done?



Numerous challenges surround the design and use of chemicals in the well construction process. What may satisfy technical requirements may not also satisfy stringent environmental controls. This lecture discusses and presents real-life examples of drilling chemicals that have been designed and often redesigned to fit stringent environmental criteria according to the locations in which they are used.

John Hall is Senior Environmental Scientist at Halliburton. He earned a BS degree in marine biology from the University of Newcastle, an MS degree in ecological and environmental sciences from the University of Lancaster, and a PhD degree in environmental effects of marine pollutants from the University of Newcastle.

Reserves Management and Auditability—Critical Requirements in Today's Oil and Gas Industry



Petroleum reserves and the technical and commercial support underlying them have become a hot topic of discussion in the investment community and the media. This lecture focuses on the need for a reserves system that captures the total resource portfolio, the critical decision points within that system and the need for a process that provides

quality control and an audit trail to ensure reporting requirements are met.

Tony Harrison is Senior Manager—Reserves for Kuwait Energy. He has spent more than 30 years in the oil and gas industry. Harrison earned a BS degree in biology and geology from Oxford University.

A 20-Year Perspective on Use of Pressure-Transient Analysis



This lecture on how a major operator has used pressure-transient analysis (PTA) over the past 20 years, particularly in expensive, deepwater developments, will enable petroleum engineers to make better choices about how they should appraise and survey their own oil and gas reservoirs.

Robert H. Hite is Principal Technical Expert and a Reservoir Engineering Adviser for Shell. He consults on PTA for Shell's

worldwide operations and is the primary reservoir engineering instructor for Shell's well-testing classes. Hite earned a BS degree in chemical engineering from Georgia Institute of Technology and a PhD degree in chemical engineering from Rice University.

Higher-Order Methods in Reservoir Simulation: Luxury or Necessity?



Higher-order methods correctly approximate the transmissibilities, faults, and fractures and capture sharp fronts in the saturations. Are the reservoir engineers willing to trade-off the accuracy and reliability of higher-order methods with the speed of the first-order methods? This lecture presents several numerical examples including some field-scale results to show that the time has come for a change.

Hussein Hoteit is a Senior Reservoir Engineer at ConocoPhillips. He earned a BS degree in pure math and computer sciences from the Lebanese University, and MS and PhD degrees in applied math from Université de Rennes, France.

The Strategic Significance and Practicalities of CO₂ Enhanced Oil Recovery and Storage



As there is a global imperative to reduce CO₂ emissions, this opportunity is also available to other countries with significant coal-fired electricity generation and an indigenous oil industry. This lecture includes policy background, plans by utility companies, sources and sinks for CO₂, the EOR opportunity, infrastructure requirements, and engineering challenges.

David S. Hughes is Technical Head Carbon Storage for Senergy. He is a reservoir engineer with 27 years of experience. Hughes edits the online periodical Improved Oil Recovery Views. He earned a BS degree in physics from the University of Surrey.

Recommendations for Designing Nondamaging Acid Stimulation Fluids for Oil and Gas Bearing Reservoirs



This lecture presents and discusses the chemistry of acid additives, the damage that may be caused by wrong choice acid additives, the formulation of acids, certain mineralogy concerns, and the tests required to ensure the quality of the acid pumped. Pumping nondamaging acids has applicability not only to Canadian oil and gas wells, but to all producing fields worldwide.

Malcolm Knopp is Senior Acidizing Specialist with BJ Services Company Canada. He earned a BS degree in chemistry from the University of East Anglia at Norwich, England, and has been a part-time instructor at the Canadian Petroleum Institute.

The Production Management of Unstable Light, Crude Oils Showing Asphaltene Deposition Problems



tendency to form asphaltene deposits.

Asphaltenes are colloidal particles that remain in suspension in crude oil under reservoir conditions but they may become unstable and form a solid deposit once production is established. This lecture reviews a successful production management strategy to prevent flow assurance problems associated with an unstable, light crude oil showing strong

Luiz Marques worked with Petrobras for 32 years in both downstream and upstream segments. He teaches organic deposition and flow assurance disciplines at Petrobras University. Marques earned a BS degree in chemical engineering from Rio de Janeiro State University, and an MS degree in metallurgy engineering from Federal University of Rio de Janeiro.

Appropriate Hydraulic Fracturing Technologies for Mature Oil and Gas Formations



used to illustrate the effectiveness of these techniques, when they are systematically applied.

Hydraulic fracturing has been described as one of the three most significant technologies to be developed in the upstream oil and gas industry in the last 50 years. The successful application of hydraulic fracturing to mature oil and gas reservoirs is about recognizing that there is a wide range of appropriate solutions available. A number of case histories are

Anthony Martin is Business Development Manager for International Stimulation. He teaches fracturing, acidizing, and sand control, both in-house and externally, to customers. Martin is author of BJ Services' Hydraulic Fracturing Manual. He graduated from Imperial College, London, with an honors degree in mechanical engineering and an MS degree in petroleum engineering.

Liquefied Natural Gas (LNG)—Roaring Ahead—Where Will it End?



investment levels in this exciting part of the oil and gas industry are touched upon.

Tremendous growth is driving the LNG industry as new countries are becoming exporters. The base-load plants are almost doubling in train size. The LNG supply/demand pattern has become increasingly complex. This presentation illustrates important developments in the world of LNG. Changing technology, new trade patterns, and the required

John Morgan is President of John M. Campbell and Company. He consults for both North American and international clients. Morgan performs training in LNG, oil and gas production facilities, and gas plants around the world. He earned a BS degree in chemical engineering from London University, an ME degree in chemical and petroleum refinery engineering from Colorado School of Mines, and is a registered professional engineer in Colorado.

Guilt and Absolution in Naturally Fractured Reservoir Characterization: The Cause and Devilish Effect of Heterogeneity



fully with sound, creative engineering insight of observed flow behavior. This approach does not guarantee salvation, but it improves the odds.

Because we sample the reservoir below its representative elemental volume there are limits to what can be known from downhole data alone; it must be placed into a larger context. Our understanding of these data requires that the naturally fractured reservoir (NFR) be interpreted in light of competent geologic understanding of fracture systems, integrated

Wayne Narr is a research consultant on the Reservoir Simulation Research Team for Chevron Energy Technology. He is a structural geologist and works on both technology development and consulting projects involving characterization of NFRs. Narr earned a BS degree from Pennsylvania State University, an MS degree from University of Toronto, and a PhD degree in geology from Princeton University.

Cements and Cementing: An Old Technique With a Future?



Alternative isolation techniques have been introduced for either complementing or even suppressing the need for well cementing. Tailored cements range from basic to highly technical ones to fit almost any well requirement. The versatility and adaptability of these cement based solutions to fit well "cementing" needs make it a key element in today's well architecture, as wells can be designed differently taking into consideration the properties of these new cementing materials.

Bernard Piot is a Technical Adviser and Cementing Project Manager in the Schlumberger Riboud Product Center. He works on short-term engineering projects aimed at extending the scope and widening the applications of current commercial well cementing technology. Piot earned an engineering degree in chemistry from Ecole Européenne de Chimie Polymères et Matériaux de Strasbourg.

Remediating Cusiana and Cupiagua Fracturing between a Rock and a Hard Place



In Colombia's Cusiana and Cupiagua fields, initial well rates were disappointing, mostly because of a combination of difficult perforating conditions and significant drilling induced damage. A team was formed to determine if and how BP could fracture stimulate in the most effective manner possible. This team proposed a number of solutions for both the

fields that were subsequently implemented. Issues that were addressed included coping with well deviation/azimuth, rigorous prefrac wellbore preparation, novel fracstring deployment, fracturing and an efficient remedial stacking of fracs.

Martin Rylance is a Senior Petroleum Engineer and Engineering Adviser for BP Exploration. He earned a BS degree in pure mathematics from the University of Salford. Rylance is also a fellow of the Institute of Mathematics in London.

Cold Production: Recovery Mechanisms and Field Performance



This lecture presents two themes: a description of the dominant recovery mechanisms, foamy oil flow and wormhole network growth, obtained from laboratory-scale investigations; and, a description of field performance, illustrated through case studies involving field data and field-scale reservoir simulations.

Ron Sawatzky is a Senior Research Scientist in the heavy oil and oil sands business unit at the Alberta Research Council. He earned BMath and MPhil degrees in applied mathematics from the University of Waterloo, and a PhD degree in applied mathematics from the University of Alberta. For the past 15 years, Sawatzky has served as one of the team leaders for the council's cold production research group.

Value of Seamlessly Collaborative Integrated Studies



This lecture focuses on the importance and value of well-defined collaborative multidisciplinary, multicultural, and integrated studies executed seamlessly over the entire upstream business units of a typical oil and gas company. It is not only essential for running a successful petroleum business enterprise, but also necessary for its long-term survival.

Yasin Senturk is a Principal Professional of Petroleum Engineering and Development for Saudi Aramco. He earned a BS degree in petroleum engineering from Middle East Technical University, Ankara, Turkey, an MS degree in petroleum engineering and an ME degree in industrial engineering both from the University of Alberta, and an MS degree in economics from the University of Oklahoma. Senturk advises

Saudi Aramco Management and the Petroleum Ministry in his areas of expertise.

The Growing Demand for Oil and Natural Gas and the Related Global Warming Issues



This presentation includes discussion of sustainable issues affecting the oil industry, such as activities that involve sequestration of greenhouse gases in depleted reservoirs (often with oil or gas production as a byproduct). The global warming issue is briefly illuminated with historical background of Earth's many interglacial episodes and sharp temperature oscillations.

George Stosur managed the upstream oil and gas R&D program for the US Department of Energy. He has authored 86 papers and two textbook chapters on oil recovery. Stosur earned an MS degree in mining engineering from Mining and Metallurgy Academy, Krakow, Poland, an MS degree in petroleum engineering from Louisiana State University, and a DS degree in petroleum and natural gas engineering from the Mining and Metallurgy Academy, Krakow, Poland.

When is Classic Sand Control Not Enough?—The Impact of Formation Fines



This presentation discusses a stepwise approach to evaluating the potential for fines production, ways to address the issue; and appraise the overall impact on the life cycle and operating costs of the well. Several case histories are presented to illustrate how it is possible to address problems related to the movement of formation fines.

David Underdown is a Senior Adviser for Chevron Energy Technology. He earned a PhD degree in physical chemistry from the University of Houston. Underdown is current Chairperson of the API Task Force on Perforating.

Produced Water Management Options—One Size Does Not Fit All



This lecture describes many produced water management options using the concept of a 3-tiered water management/pollution prevention hierarchy: minimize water production, recycle or reuse, and treat and dispose. This lecture offers guidance on the factors that should be considered by company managers to select the management options that are most appropriate for a particular site.

John Veil is Manager of the Water Policy Program for Argonne National Laboratory. He earned a BA degree in earth and planetary science from Johns Hopkins University, an MS degree in zoology from the University of Maryland, and an MS degree in

civil engineering from the University of Maryland. Veil served as a faculty member of the Department of Zoology at the University of Maryland. He is the lead author of the 2004 “White Paper Describing Produced Water from Production of Crude Oil, Natural Gas, and Coal Bed Methane.”

Enhancing Offshore Asset Value—Indian Experience



Induction of new technologies that are in reservoir drilling, production, and construction activities at a total cost of USD 2.5 billion resulting in additional recovery of 3–4% of oil. The redevelopment campaign provided endless opportunities for innovative approaches in total planning, cost optimization, drilling/workover of wells, surface facilities, etc. that have helped in enhancing the asset value.

P.K. Verma is Executive Director and Asset Manager (Neelam and Heera) Asset, for Oil and Natural Gas Corporation. He earned a BTech degree in petroleum engineering. Verma has more than 30 technical papers published in various national and international forums.

Mature Fields: Keep Revisiting the Fundamentals



Kutubu is Papua New Guinea’s largest oil field. It came on line in 1992 and achieved peak rates in 1993 before decline began in 1994. A follow up development campaign, along with other projects, has for 4 years completely halted the production decline. The field now appears to have a considerable remaining life of up to 2 decades. This

lecture’s main conclusion is that we regularly need to go back to basics and establish whether or not our fundamental assumptions are supported by solid evidence.

Neil Williams is currently in charge of the reservoir engineering, geoscience, planning, and development of the Kutubu field for Oil Search. He earned a BS degree from Sydney University in applied mathematics, and a PhD degree in fluid mechanics from the University of New South Wales.

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