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ELLE ROBERTSO

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Sustainable Materials for Oil and Gas Applications Gulf Professional Publishing Applied Techniques to Integrated Oil and Gas

Reservoir Characterization: A Problem-Solution Discussion with Experts presents challenging questions encountered by geoscientists in their day-to-day work in the exploration and development of oil and gas fields and provides potential solutions from experts working in the field. Covers Amplitude Versus Offset (AVO), well-to-seismic tie, phase of seismic data, seismic inversion studies, pore pressure prediction, rock physics and exploration geological. The text examines challenges in the industry as well as the solutions and techniques used to overcome those challenges. Over the past several years there has been a growing integration of geophysical, geological, and reservoir engineering, production and petrophysical data to predict and determine reservoir properties. This includes reservoir extent and sand development away from the well bore, as well as in unpenetrated prospects, leading to optimization planning for field development. As such, geoscientists now must learn the technology, processes and challenges involved within their specific functions in order to

complete day-to-day activities. Presents a thorough understanding of the requirements and issues of various disciplines in characterizing a wide spectrum of reservoirs Includes real-life problems and challenging questions encountered by geoscientists in their day-to-day work, along with answers from experts working in the field Provides an integrated approach among different disciplines (geology, geophysics, petrophysics, and petroleum engineering) Gulf Professional Publishing Covering ideas and methods while concentrating on fundamentals, this book includes wave motion; digital imaging; digital filtering; visualization aspects of the seismic reflection method; sampling theory; the frequency spectrum; synthetic seismograms; wavelet processing; deconvolution; seismic attributes; phase rotation; and seismic attenuation. *Integrated Reservoir Characterization and Modeling for Enhanced Hydrocarbons Recovery from Mature Gas-condensate Reservoirs* Elsevier PVT properties are necessary for reservoir/well performance forecast and optimization. In absence of PVT laboratory

measurements, finding the right correlation to estimate accurate PVT properties could be challenging. PVT Property Correlations: Selection and Estimation discusses techniques to properly calculate PVT properties from limited information. This book covers how to prepare PVT properties for dry gases, wet gases, gas condensates, volatile oils, black oils, and low gas-oil ration oils. It also explains the use of artificial neural network models in generating PVT properties. It presents numerous examples to explain step-by-step procedures in using techniques designed to deliver the most accurate PVT properties from correlations. Complimentary to this book is PVT correlation calculator software. Many of the techniques discussed in this book are available with the software. This book shows the importance of PVT data, provides practical tools to calculate PVT properties, and helps engineers select PVT correlations so they can model, optimize, and forecast their assets. Understand how to prepare PVT data in absence of laboratory reports for all fluid types Become equipped with a comprehensiv

e list of PVT correlations and their applicability ranges Learn about ANN models and their applications in providing PVT data Become proficient in selecting best correlations and improving correlations results

Reservoir Model Design

Elsevier

This book describes the application of modern information technology to reservoir modeling and well management in shale. While covering Shale Analytics, it focuses on reservoir modeling and production management of shale plays, since conventional reservoir and production modeling techniques do not perform well in this environment. Topics covered include tools for analysis, predictive modeling and optimization of production from shale in the presence of massive multi-cluster, multi-stage hydraulic fractures. Given the fact that the physics of storage and fluid flow in shale are not well-understood and well-defined, Shale Analytics avoids making simplifying assumptions and concentrates on facts (Hard Data - Field Measurements) to reach conclusions. Also discussed are important insights into understanding completion practices and re-frac candidate selection and design. The flexibility and

power of the technique is demonstrated in numerous real-world situations.

Asphaltene Deposition

Pennwell Corporation

Covering reservoir engineering fundamentals, advanced reservoir related topics, reservoir simulation fundamentals, and problems and case studies from around the world, this guide is designed to aid students and professionals alike in their active and important roles throughout the reservoir life cycle.

Developments in Modeling and Optimization of Production in Unconventional Oil and Gas Reservoirs

SEG Books

As global consumption of fossil fuels such as oil increases, previously abundant sources have become depleted or plagued with obstructions. Asphaltene deposition is one of such obstructions which can significantly decrease the rate of oil production. This book offers concise yet thorough coverage of the complex problem of asphaltene precipitation and deposition in oil production. It covers fundamentals of chemistry, stabilization theories and mechanistic approaches of asphaltene behavior at high temperature and pressure.

Asphaltene Deposition:

Fundamentals, Prediction, Prevention, and Remediation explains techniques for experimental determination of asphaltene precipitation and deposition and different modeling tools available to forecast the occurrence and magnitude of asphaltene deposition in a given oil field. It discusses strategies for mitigation of asphaltene deposition using chemical inhibition and corresponding challenges, best practices for asphaltene remediation, current research, and case studies. *Integrated Reservoir Asset Management* Gulf Professional Publishing Sustainable Materials for Oil and Gas Applications, a new release in the Advanced Materials and Sensors for the Oil and Gas Industry series, comprises a list of processes across the upstream and downstream sectors of the industry and the latest research on advanced nanomaterials . Topics include enhanced oil recovery mechanisms of nanofluids, health and safety features related to nanoparticle handling, and advanced materials for produced water treatments. Supplied from contributing experts in both academic and corporate backgrounds, the reference contains developments, applications, advantages

and challenges. Located in one convenient resource, the book addresses real solutions as oil and gas companies try to lower emissions. As the oil and gas industry are shifting and implementing innovative ways to produce oil and gas in an environmentally friendly way, this resource is an ideal complement to their work. Covers developments, workflows and protocols in advanced materials for today's oil and gas sectors Helps readers gain insights from an experienced list of editors and contributors from both academia and corporate backgrounds Address environmental challenges in oil and gas through technological solutions in nanotechnology *Reservoir Characterization* Gulf Professional Publishing The demand for oil and gas is increasing yearly, whereas proven oil and gas reserves are being depleted. The potential of stripper oil and gas fields to supplement the national energy supply is large. In 2006, stripper wells accounted for 15% and 8% of US oil and gas production, respectively. With increasing energy demand and current high oil and gas prices, integrated reservoir studies, secondary and tertiary

recovery methods, and infill drilling are becoming more common as operators strive to increase recovery from stripper oil and gas fields. The primary objective of this research was to support optimized production of oil and gas from stripper well fields by evaluating one stripper gas field and one stripper oil field. For the stripper gas field, I integrated geologic and engineering data to build a detailed reservoir characterization model of the Second White Specks (SSPK) reservoir in Garden Plains field, Alberta, Canada. The objectives of this model were to provide insights to controls on gas production and to validate a simulation-based method of infill drilling assessment. SSPK was subdivided into Units A? D using well-log facies. Units A and B are the main producing units. Unit A has better reservoir quality and lateral continuity than Unit B. Gas production is related primarily to porosity-netthickness product and permeability and secondarily to structural position, minor structural features, and initial reservoir pressure. For the stripper oil field, I evaluated the Green River formation in the Wells Draw area of

Monument Butte field, Utah, to determine interwell connectivity and to assess optimal recovery strategies. A 3D geostatistical model was built, and geological realizations were ranked using production history matching with streamline simulation. Interwell connectivity was demonstrated for only major sands and it increases as well spacing decreases. Overall connectivity is low for the 22 reservoir zones in the study area. A water-flood-only strategy provides more oil recovery than a primary-then-waterflood strategy over the life of the field. For new development areas, water flooding or converting producers to injectors should start within 6 months of initial production. Infill drilling may effectively produce unswept oil and double oil recovery. CO2 injection is much more efficient than N2 and CH4 injection. Water-alternating-CO2 injection is superior to continuous CO2 injection in oil recovery. The results of this study can be used to optimize production from Garden Plains and Monument Butte fields. Moreover, these results should be applicable to similar stripper gas and oil field fields. Together, the

two studies demonstrate the utility of integrated reservoir studies (from geology to engineering) for improving oil and gas recovery.

Shale Analytics

Elsevier Unconventional Oil and Gas Resources Handbook: Evaluation and Development is a must-have, helpful handbook that brings a wealth of information to engineers and geoscientists. Bridging between subsurface and production, the handbook provides engineers and geoscientists with effective methodology to better define resources and reservoirs. Better reservoir knowledge and innovative technologies are making unconventional resources economically possible, and multidisciplinary approaches in evaluating these resources are critical to successful development. Unconventional Oil and Gas Resources Handbook takes this approach, covering a wide range of topics for developing these resources including exploration, evaluation, drilling, completion, and production. Topics include theory, methodology, and case histories and will help to improve the understanding ,integrated evaluation, and effective development of unconventional resources.

Presents methods for a full development cycle of unconventional resources, from exploration through production Explores multidisciplinary integrations for evaluation and development of unconventional resources and covers a broad range of reservoir characterization methods and development scenarios Delivers balanced information with multiple contributors from both academia and industry Provides case histories involving geological analysis, geomechanical analysis, reservoir modeling, hydraulic fracturing treatment, microseismic monitoring, well performance and refracturing for development of unconventional reservoirs DEVELOPMENT OF AN ADVANCED APPROACH FOR NEXT-GENERATION INTEGRATED RESERVOIR CHARACTERIZATION. Gulf Professional Publishing The essential resource to an integrated approach to reservoir modelling by highlighting both the input of data and the modelling results Reservoir Modelling offers a comprehensive guide to the procedures and workflow for building a 3-D model. Designed to be practical, the principles outlined can be applied to

any modelling project regardless of the software used. The author — a noted practitioner in the field — captures the heterogeneity due to structure, stratigraphy and sedimentology that has an impact on flow in the reservoir. This essential guide follows a general workflow from data QC and project management, structural modelling, facies and property modelling to upscaling and the requirements for dynamic modelling. The author discusses structural elements of a model and reviews both seismic interpretation and depth conversion, which are known to contribute most to volumetric uncertainty and shows how large-scale stratigraphic relationships are integrated into the reservoir framework. The text puts the focus on geostatistical modelling of facies and heterogeneitie s that constrain the distribution of reservoir properties including porosity, permeability and water saturation. In addition, the author discusses the role of uncertainty analysis in the static model and its impact on volumetric estimation. The text also addresses some typical approaches to modelling specific reservoirs through a mix

of case studies and illustrative examples and: Offers a practical guide to the use of data to build a successful reservoir model Draws on the latest advances in 3-D modelling software Reviews facies modelling, the different methods and the need for understanding the geological interpretation of cores and logs Presents information on upscaling both the structure and the properties of a fine-scale geological model for dynamic simulation Stresses the importance of an interdisciplinary team-based approach Written for geophysicists, reservoir geologists and petroleum engineers, Reservoir Modelling offers the essential information needed to understand a reservoir for modelling and contains the multidisciplinary nature of a reservoir modelling project.

PVT Property Correlations

Springer

F. Jerry Lucia, working in America's main oil-rich state, has produced a work that goes after one of the holy grails of oil prospecting. One main target in petroleum recovery is the description of the three-dimensional distribution of petrophysical properties on the interwell scale in carbonate reservoirs. Doing so would improve performance predictions by means of

fluid-flow computer simulations. Lucia's book focuses on the improvement of geological, petrophysical, and geostatistical methods, describes the basic petrophysical properties, important geology parameters, and rock fabrics from cores, and discusses their spatial distribution. A closing chapter deals with reservoir models as an input into flow simulators. *Integrated Flow Modeling* Gulf Professional Publishing Accurate, high-resolution, three-dimensional (3D) reservoir characterization can provide substantial benefits for effective oilfield management. By doing so, the predictive reliability of reservoir flow models, which are routinely used as the basis for investment decisions involving hundreds of millions of dollars and designed to recover millions of barrels of oil, can be significantly improved. Even a small improvement in incremental recovery for high-value assets can result in important contributions to bottom-line profitability. Today's standard practice for developing a 3D reservoir description is to use seismic inversion techniques. These techniques make use of geostatistics and other stochastic

methods to solve the inverse problem, i.e., to iteratively construct a likely geologic model and then upscale and compare its acoustic response to that actually observed in the field. This method has several inherent flaws, such as: (1) The resulting models are highly non-unique; multiple equiprobable realizations are produced, meaning (2) The results define a distribution of possible outcomes; the best they can do is quantify the uncertainty inherent in the modeling process, and (3) Each realization must be run through a flow simulator and history matched to assess it's appropriateness, and therefore (4) The method is labor intensive and requires significant time to complete a field study; thus it is applied to only a small percentage of oil and gas producing assets. A new approach to achieve this objective was first examined in a Department of Energy (DOE) study performed by Advanced Resources International (ARI) in 2000/2001. The goal of that study was to evaluate whether robust relationships between data at vastly different scales of measurement could be established using virtual intelligence (VI) methods. The proposed

workflow required that three specific relationships be established through use of artificial neural networks (ANN's): core-to-log, log-to-crosswell seismic, and crosswell-to-surface seismic. One of the key attributes of the approach, which should result in the creation of high resolution reservoir characterization with greater accuracy and with less uncertainty than today's methods, is the inclusion of borehole seismic (such as crosswell and/or vertical seismic profiling--VSP) in the data collection scheme. Borehole seismic fills a critical gap in the resolution spectrum of reservoir measurements between the well log and surface seismic scales, thus establishing important constraints on characterization outcomes. The results of that initial study showed that it is, in fact, feasible to establish the three critical relationships required, and that use of data at different scales of measurement to create high-resolution reservoir characterization is possible. Based on the results of this feasibility study, in September 2001, the DOE, again through ARI, launched a subsequent two-year government-industry R & D project to further develop and

demonstrate the technology. The goals of this project were to: (1) Make improvements to the initial methodology by incorporating additional VI technologies (such as clustering), using core measurements in place of magnetic resonance image (MRI) logs, and streamlining the workflow, among others. (2) Demonstrate the approach in an integrated manner at a single field site, and validate it via reservoir modeling or other statistical methods. *Integrated Reservoir Characterization and Simulation Studies in Stripper Oil and Gas Fields* Springer Integrated reservoir modeling has become an important part of day-to-day decision analysis in oil and gas management practices. A very attractive and promising technology is the use of time-lapse or 4D seismic as an essential component in subsurface modeling. Today, 4D seismic is enabling oil companies to optimize production and increase recovery through monitoring fluid movements throughout the reservoir. 4D seismic advances are also being driven by an increased need by the petroleum engineering community to become more quantitative and accurate

in our ability to monitor reservoir processes. Qualitative interpretations of time-lapse anomalies are being replaced by quantitative inversions of 4D seismic data to produce accurate maps of fluid saturations, pore pressure, temperature, among others. Within all steps involved in this subsurface modeling process, the most demanding one is integrating the geologic model with dynamic field data, including 4Dseismic when available. The validation of the geologic model with observed dynamic data is accomplished through a "history matching" (HM) process typically carried out with well-based measurement s. Due to low resolution of production data, the validation process is severely limited in its reservoir areal coverage, compromising the quality of the model and any subsequent predictive exercise. This research will aim to provide a novel history matching approach that can use information from high-resolution seismic data to supplement the areally sparse production data. The proposed approach will utilize streamline-derived sensitivities as means of relating the forward model performance

with the prior geologic model. The essential ideas underlying this approach are similar to those used for high-frequency approximations in seismic wave propagation. In both cases, this leads to solutions that are defined along "streamlines" (fluid flow), or "rays" (seismic wave propagation). Synthetic and field data examples will be used extensively to demonstrate the value and contribution of this work. Our results show that the problem of non-uniqueness in this complex history matching problem is greatly reduced when constraints in the form of saturation maps from spatially closely sampled seismic data are included. Further on, our methodology can be used to quickly identify discrepancies between static and dynamic modeling. Reducing this gap will ensure robust and reliable models leading to accurate predictions and ultimately an optimum hydrocarbon extraction.

Geostatistical Methods for Reservoir Geophysics

Gulf Professional Publishing

Reservoir Engineering focuses on the fundamental concepts related to the development of conventional and unconventional reservoirs and how these

concepts are applied in the oil and gas industry to meet both economic and technical challenges. Written in easy to understand language, the book provides valuable information regarding present-day tools, techniques, and technologies and explains best practices on reservoir management and recovery approaches. Various reservoir workflow diagrams presented in the book provide a clear direction to meet the challenges of the profession. As most reservoir engineering decisions are based on reservoir simulation, a chapter is devoted to introduce the topic in lucid fashion. The addition of practical field case studies make Reservoir Engineering a valuable resource for reservoir engineers and other professionals in helping them implement a comprehensive plan to produce oil and gas based on reservoir modeling and economic analysis, execute a development plan, conduct reservoir surveillance on a continuous basis, evaluate reservoir performance, and apply corrective actions as necessary. Connects key reservoir fundamentals to modern engineering applications Bridges the conventional

methods to the unconventional, showing the differences between the two processes Offers field case studies and workflow diagrams to help the reservoir professional and student develop and sharpen management skills for both conventional and unconventional reservoirs *Fast History Matching of Time-lapse Seismic and Production Data for High Resolution Models* McGraw-Hill Education Intelligent Digital Oil and Gas Fields: Concepts, Collaboration, and Right-time Decisions delivers to the reader a roadmap through the fast-paced changes in the digital oil field landscape of technology in the form of new sensors, well mechanics such as downhole valves, data analytics and models for dealing with a barrage of data, and changes in the way professionals collaborate on decisions. The book introduces the new age of digital oil and gas technology and process components and provides a backdrop to the value and experience industry has achieved from these in the last few years. The book then takes the reader on a journey first at a well level through instrumentation and measurement for real-time data acquisition, and then provides

practical information on analytics on the real-time data. Artificial intelligence techniques provide insights from the data. The road then travels to the "integrated asset" by detailing how companies utilize Integrated Asset Models to manage assets (reservoirs) within DOF context. From model to practice, new ways to operate smart wells enable optimizing the asset. Intelligent Digital Oil and Gas Fields is packed with examples and lessons learned from various case studies and provides extensive references for further reading and a final chapter on the "next generation digital oil field," e.g., cloud computing, big data analytics and advances in nanotechnology. This book is a reference that can help managers, engineers, operations, and IT experts understand specifics on how to filter data to create useful information, address analytics, and link workflows across the production value chain enabling teams to make better decisions with a higher degree of certainty and reduced risk. Covers multiple examples and lessons learned from a variety of reservoirs from around the world and production situations Includes techniques on

change management and collaboration Delivers real and readily applicable knowledge on technical equipment, workflows and data challenges such as acquisition and quality control that make up the digital oil and gas field solutions of today Describes collaborative systems and ways of working and how companies are transitioning work force to use the technology and making more optimal decisions

Petroleum Reservoir Modeling and Simulation: Geology, Geostatistics, and Performance Prediction

Gulf Professional Publishing

This book provides a self-contained introduction to the simulation of flow and transport in porous media, written by a developer of numerical methods. The reader will learn how to implement reservoir simulation models and computational algorithms in a robust and efficient manner. The book contains a large number of numerical examples, all fully equipped with online code and data, allowing the reader to reproduce results, and use them as a starting point for their own work. All of the examples in the book are based on the MATLAB Reservoir Simulation Toolbox (MRST), an

open-source toolbox popular popularity in both academic institutions and the petroleum industry. The book can also be seen as a user guide to the MRST software. It will prove invaluable for researchers, professionals and advanced students using reservoir simulation methods. This title is also available as Open Access on Cambridge Core.

Practical Enhanced Reservoir Engineering

Springer Nature

Over the past several years, there has been a growing integration of data – geophysical, geological, petrophysical, engineering-related, and production-related – in predicting and determining reservoir properties. As such, geoscientists now must learn the technology, processes, and challenges involved within their specific functions in order to optimize planning for oil field development. Applied Techniques to Integrated Oil and Gas Reservoir Characterization presents challenging questions encountered by geoscientists in their day-to-day work in the exploration and development of oil and gas fields and provides potential solutions from experts. From basin analysis of conventional

and unconventional reservoirs, to seismic attributes analysis, NMR for reservoir characterization, amplitude versus offset (AVO), well-to-seismic tie, seismic inversion studies, rock physics, pore pressure prediction, and 4D for reservoir monitoring, the text examines challenges in the industry as well as the techniques used to overcome those challenges. This book includes valuable contributions from global industry experts: Brian Schulte (Schiefer Reservoir Consulting), Dr. Neil W. Craigie (Saudi Aramco), Matthijs van der Molen (Shell International E&P), Dr. Fred W. Schroeder (ExxonMobil, retired), Dr. Tharwat Hassane (Schlumberger & BP, retired), and others. Presents a thorough understanding of the requirements of various disciplines in characterizing a wide spectrum of reservoirs Includes real-life problems and challenging questions encountered by geoscientists in their day-to-day work, along with answers from experts working in the field Provides an integrated approach among different disciplines (geology, geophysics, petrophysics, and petroleum engineering) Offers advice from industry

experts to geoscience students, including career guides and interview tips **Integrated Reservoir Characterization** Elsevier All too often, senior reservoir managers have found that their junior staff lack an adequate understanding of reservoir management techniques and best practices needed to optimize the development of oil and gas fields. Written by an expert professional/educator, Integrated Reservoir Asset Management introduces the reader to the processes and modeling paradigms needed to develop the skills to increase reservoir output and profitability and decrease guesswork. One of the only references to recognize the technical diversity of modern reservoir management teams, Fanchi seamlessly brings together concepts and terminology, creating an interdisciplinary approach for solving everyday problems. The book starts with an overview of reservoir management, fluids, geological principles used to characterization, and two key reservoir parameters (porosity and permeability). This is followed by an uncomplicated review of multi-phase fluid flow equations, an overview of

the reservoir flow modeling process and fluid displacement concepts. All exercises and case studies are based on the authors 30 years of experience and appear at the conclusion of each chapter with hints in addition of full solutions. In addition, the book will be accompanied by a website featuring supplementary case studies and modeling exercises which is supported by an author generated computer program. Straightforward methods for characterizing subsurface environments Effortlessly gain and understanding of rock-fluid interaction relationships An uncomplicated overview of both engineering and scientific processes Exercises at the end of each chapter to demonstrate correct application Modeling tools and additional exercise are included on a companion website *Petroleum Reservoir Simulation* Elsevier Reservoir Engineering ebook Collection contains 7 of our best-selling titles, providing the ultimate reference for every reservoir engineer's library. Get access to over 5000 pages of reference material, at a fraction of the price of the hard-copy books. This CD contains the complete ebooks of the following 7 titles: Civan,

Reservoir Formation Damage 2nd Edition, 97807506773 87 FANCHI, Principles of Applied Reservoir Simulation 3rd Edition, 97807506793 36 Chin, Quantitative Methods in Reservoir Engineering, 97807506756 80 Dake, The Practice of Reservoir Engineering, 97804445067 19 Ahmed, Reservoir Engineering Handbook 3rd Edition, 97807506797 25 Ahmed, Advanced Reservoir Engineering, 97807506773 32 Slatt , Stratigraphic reservoir characterizati on for petroleum geologists, geophysicists and engineers, 97804445281 86 *Seven fully searchable titles on one CD providing instant access to the ULTIMATE library of engineering materials for professionals in the petroleum industry *5000 pages of practical and theoretical reservoir engineering information in one portable package. *Incredible value at a fraction of the cost of the print books Basic Applied Reservoir Simulation CRC Press Integrated Flow Modeling presents the formulation, development and application of an integrated flow simulator (IFLO). Integrated flow models make it possible to work directly with seismically generated

data at any time during the life of the reservoir. An integrated flow model combines a traditional flow model with a petrophysical model. The text discusses properties of porous media within the context of multidisciplinary reservoir modeling, and presents the technical details needed to understand and apply the simulator to realistic problems. Exercises throughout the text direct the reader to software applications using IFLO input data sets and an executable version of IFLO provided with the text. The text-software combination provides the resources needed to convey both theoretical concepts and practical skills to geoscientists and engineers.