



Book review

The Petroleum Engineering nowadays as the latest 46th release of Elsevier's internationally recognized series Developments in Petroleum Science, a book

Hydrocarbon Exploration and Production by F. Jahn, M. Cook and M. Graham. 1998. Elsevier, Amsterdam-Lausanne-New York-Oxford-Shannon-Singapore-Tokyo; 394 p.

The authors: Three experienced practitioners, managers, consultants and trainers gaining their knowledge, skills and considerations from many sites and events at the among most hot locations on the Globe, including Far and Middle East, Africa, Netherlands and UK, for the petroleum search, exploration and production. They are founders and acting leaders of TRACS International Ltd growing up and doing well since 1992 in Aberdeen (United Kingdom).

Subject: An overview and insight into the whole life of the oil and gas field since its potential looking for and discovery through its appraisal, planning and development, standing production and up to the ending life point of decommissioning. The coverage is deriving from the personal experience, feelings, common sense, recent state-of-art in the field and future concepts of the authors. This all is appreciative and encouraging to anyone.

Readers: Professionals of the petroleum upstream industry looking for an introductory reference in the whole subject including methodology, modern technologies implemented or observed in the shortly coming time and, finally, business or economic considerations becoming increasingly important. Persons not working for the petroleum companies, but involved into support services are also seen among the intended readers. The multidisciplinary link building and demonstration is desired for the scope. Students of all grades are also considered.

Presentation: The body of the book is subdivided into 16 Chapters looking nontraditional at the first glance. Altogether 75 sections and 48 subsections, correspondingly numbered are separated. The number of figures assigned by chapters is 267 and this of tables, all untitled and not numbered, is 11. However, some of the figures are data tables. The figures are charts, sketches, two- and three-dimensional diagrams, graphs, maps, cross-sections, logs and columns, all styled and simplified to greatest extend to provide the readers with best visualization of the materials, descriptions, models and concepts considered in the book. Four photographs (one in color) are among them only. Another color figure is a technical illustrative chart. Three of the photographs are picking up offshore drilling exploration facilities in use recently. The drawing art of the illustrations is as good as possible. There is a list of selected bibliography, although a short one, containing 17 titles only, but being an adequate and up to date by the beginning of 1997 and reflecting the preferences and desk books selection of the authors. On 10 pages at the end is placed a very detailed and instructive subject index.

Editorially, linguistically, polygraphically and technically the book is well handled and produced. Better use of the printing space and room could however be desired and utilized.

Content Essential and Composition: Although differing by length, structure and formal composition all chapters bear short introducing parts containing a comprehensive list of keywords and acronyms and introduction and commercial application notes. The same is true for each of the four sections of the Chapter 5, the lengthiest one, spread over 77 pages with 77 figs. and 5 tables, also. The first Chapter, e.g., being a general introductory and covering the oil and gas field life cycle has the following keywords list: exploration, appraisal, feasibility, development planning, production profile, production, abandonment, project economics, cash flow. All these keywords are described and referred to in the same chapter, but considered in more detail elsewhere in the book. All references are, however, listed by pages in the Index at the end of the book body. Likely are the cases with the entire nomenclature by corresponding chapters, turned into glo-

bal for the book, making it a convenient and handy tool for any user.

The Chapters are subsequently following each other expanding gradually the subject up to the full coverage of the book. The Chapter 2 is picking up the whole matter of the exploration phase of the corresponding first section of the preceding Chapter 1. The same Chapter 2 is among the geologically richest subdivisions of the book considering plate tectonics, sedimentary basins, source rocks, maturation, migration, reservoir rocks, traps, seismic, gravity survey, magnetic survey, geochemistry, mudlogs, field studies, using modern and broadly used concepts, terms, visualizations and models. The same style of presentation is applied to the drilling in Chapter 3. New technologies, instruments, terms and operations, in particular with regard to the offshore exploration and production are developed here and they should be known to any acting petroleum expert everywhere. Among the most attracting ones are the directional, horizontal and extended reach drilling which were dreamed a few years ago, but are getting almost routine nowadays. Although short, but very sensitively modern is Chapter 4, dealing with the environmental risk, protection and safety. Even the greenhouse effect is not missed in the context. The Chapter 5 dealing with reservoirs is bringing some more related geology, including sedimentary models, diagenesis, fracturing, faulting and folding, reservoir fluids, hydrocarbon geochemistry, physical properties and measurements, namely of rocks, crudes, gases, condensates, hydrates, waters. Fluid pressure and pressure regimes, data collection of all subjects mentioned, including sampling, coring, wireline logging, pressure measurements, data interpretation and well correlation getting to the final section, map and 3D visualization and presentation. Contributing to this matter is the short but very stimulating Chapter 6 dealing with volumetric estimation and touching stochastic modeling. The Chapter 7 on field appraisal is the first in a row leading to the considerations of uncertainty, effective cost, seismic reprocessing, decision making, fiscal regime within the development, production and closing in the field life cycle. Next is the operational and technically instructive Chapter 8 evaluating the dependence on the reservoir dynamic behaviour, considering reservoir simulation, recovery, production profile and economics. More details getting to the well dynamic behaviour, picking also pumping, lifts and the whole well completion, are provided in Chapter 9.

Surface facilities both on- and offshore are described and illustrated in the second lengthiest Chapter 10 accommodating best international experience. Adding to this matter is Chapter 11 on production operation and maintenance, considering manning, logistics, strategies, communication tools and, again, cost. Chapter 12 is dealing with the project and contract management, while the next Chapter 13 is covering the petroleum economics in principle and in some detail, getting down to the economic models, shareholding, cashflow, revenue, pricing, cost, royalty, netting value, return rate, etc. The producing management, the most rewording in the field life cycle is brought to Chapter 14, preparing the soil for two last Chapters - 13 outlining the inevitable field decline management and 14 picking up newly sounding decommissioning approached by many, even formerly great fields. The very last one is advisable and should probably soon be a subject of quick updating and case studying.

The case studies, although not particularly separated in the book, are abundant and hopefully useful for better understanding and learning of what was considered of direct practical use in the book. The better ones should be or are probably included into the training courses texts run by the authors at TRACS in Aberdeen end elsewhere.

Availability: The book is published in March 1998 and could be ordered at both addresses of Elsevier Science: P.O. Box

211, 1000 AE Amsterdam, The Netherlands; P.O. Box 945, Madison Square Station, New York 10160-0757, USA. It is available in two versions: Hardbound priced for NLG 240.00/US\$ 138.00 and Paperback for NLG 150.00/US\$86.00.

It could very simply be accessed at <http://www.elsevier.nl> (European mirror site) and <http://www.elsevier.com> (USA mirror site).

Recommendations: They are directed to the following editions of this reference, text and almost handbook which should hopefully shortly be made by the Authors and Elsevier. Richer and better attention could be placed on new concepts and technologies including 4D-4C modeling, becoming actively used in particular during last year. Single and multivariate geostatistics, fractiles and other spatial and random variable methodologies could also be observed for application in the modern Petroleum Engineering. Data gathering and development should be considered as developing through geographical data handling such as GIS which are having good use in the petroleum activity based on most advanced computer systems, facilities and philosophies. On the cycle of prospecting and exploration much more profound use should be picked up from the basin analysis, sequence stratigraphy and areal geodynamics making the four-

ation of the recent petroleum geology. The latest developments of these concepts is in fact both spiritual and professional testament of the late Hollis Hedberg introducing 35 years ago his life idea of geotiming as a leading factor in petroleum potential estimation and search.

These recommendations should require updating of the selected bibliography, although needing to be kept as concise as possible. Reflections should also be seen in the updated Subject Index. Some technical errors should also be checked and carefully corrected (see Fig. 3.21 instead of 3.23 on page 57).

Conclusion: The final conclusion of this review is seen in the very optimistic and promising state-of-art of the Petroleum Engineering, best reflecting and influencing the future growing of geology of the recent days and times to come. No other branch of the Earth Sciences is experiencing such a rich, profitable, fine and astonishing development and acceptance by the man community.

The acting engineers, scientists and university students, not in petroleum science only, should have and use this book. It will also be useful for those trying to match the terminology in order to gain best understanding in the diverse multilanguage petroleum community in the World.

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