# TABLE OF CONTENTS

## Volume 1

**Ten Years of Experience With Stabberless Casing and Tubing Running Systems—A Safe Way To Save Time** ................................................................. 1  
H. Kinzel and C. Kiess, Weatherford Oil Tool GmbH, and S. Redzial, Weatherford Middle East Dubai

**Experimental Investigation and Network Modeling Simulation of Free Fall Gravity Drainage in Single-Matrix and Fractured-Blocks Models** ........................................... 9  

**Estimating Percentage of Fracture Fairways Detectible by Seismic Data—Case Studies From Oman** .............................................................................. 26  
Sait Ismail Ozkaya, Baker Atlas GeoScience; Pascal Richard, Petroleum Development Oman; and Guy Mueller, Brunei Shell

**4D Seismic Monitors Fluid Changes Over Time in a Carbonate Reservoir** ................................................................................. 33  
Mahfoud Al-Jenabi, William L. Soroka, Abu Baker Al-jeelani, Hafez H. Hafez, Erik Kleiss, and Peter Melville, Adco

**Downhole Integrity Management in October Field, Gulf of Suez, Egypt** ........................................................................................................ 39  
Nasr Ramadan, Gulf of Suez Petroleum Co., and George Rocha, Charlie Michel, and Michael James Hey, BP Egypt

**Expandable Sand-face Completions—Design and Performance Review of Single-Zone Applications and Journey to Next Generation Multi-Zone Systems** ....................... 47  
Quentin Morgan, Colin Jones, and Ally Macarthur, Weatherford

**Efficient Management of Production Losses to Increase Production** ................................................................................................. 55  
Ihab Othman Tarmoom and Ayyaz Mahmood Khan, Adma-Opco Abu Dhabi

**High-Impact-Resistant Cement Allows Challenging Sidetrack in Abu Dhabi** ..................................................................................... 61  
Hassan El Hassan and Mahmoud Shagnoubi, Adco, and Abdel Belmahi, Haitham Jarouji, and Eric Voon, Schlumberger

**Application of a Maximum Reservoir Contact (MRC) Well in a Thin, Carbonate Reservoir in Kuwait** ................................................................. 67  
M. Kabir, KOC; S. Ingham, Schlumberger; D. Sibley, K. Osman, A.K. Ambastha, and M. Anderson, Chevron; and B. Rahman, KOC

**Analysis of Rate Dependence in Transient Linear Flow in Tight Gas Wells** ......................................................................................... 75  
M. Ibrahim, Suez Canal U., and R.A. Wattenbarger, Texas A&M U.

**Change in Liquid Splitter Operation—Averted Environmental Flaring** ....................................................................................... 88  
Mohamed A. Egab, Manicka Vasagam, and Prafull Pandav, Abu Dhabi Gas Liquefaction Co. Ltd., UAE

**The First Horizontal Underbalanced Well Drilled in Libya: A Case Study** ................................................................. 97  
An Innovative Inert Material To Cure the Losses in the Brent Depleted Reservoirs—North Sea Case Histories ................................................................. 103
Nigel Shuttleworth, Kees Frederiks, Klaas Van DerPlas, and Steve McCraith, Shell E&P, and Salim Taoutaou, Schlumberger

Predicting Deepwater Well Behavior ................................................................ 109
Azhar Al Kindi, Shell

Quantification of Uncertainties for Drilling Induced Formation Damage ................. 113
Y. Ding, G. Renard, and B. Herzhaft, Inst. Français du Pétrole

A Novel Solution To Flow Profiling With An Improved Production Logging Tool In Short String Section Of Dual String Completions ......................................... 128
Koksal Cig, Schlumberger, Ihsan Gok, Schlumberger

Crude Stabilizer Using Localized Underpressure Generation ............................... 138
Antonio Valente and Adriano Granadeiro, Partex Oil and Gas

Financing Strategies for the Procurement of Gas Projects in Developing Countries .............................................................................................................. 151
J. Ellafi, Altahadi U.; F. Al-Thani, Anadarko Energy Co.; and A. Merna, U. of Manchester

Reliability Improvement at ADGAS .................................................................... 162
Faisa Saez, ADGAS

The History and Future of U.S. Oil and Gas ........................................................... 168
Dacun Li, The Petroleum Inst.

The Geological Use of Pressure Data: Examples From the Development of the Giant ACG Oil Field, Azerbaijan ............................................................... 173
A.D. Reynolds, BP

A New Porosity Partitioning-Based Methodology for Permeability and Texture Analysis in Abu Dhabi Carbonates ................................................................. 184
S. Al Arfi, Abu-Dhabi Co. for Onshore Oil Operations, and D. Heliot, J. Li, X. Zhan, and D. Allen, Schlumberger

The Challenges of Building Up a Geological and Reservoir Model of a Late Ordovician Glaciomarine Gas Reservoir Characterised by the Presence of Natural Fractures .............................................................................................................. 197
T. Le Maux, B. Murat, and A. Chauveau, Beicip-Franlab; M. Amamra, Groupement TFT; and K. Mesdour, Total

Bottom-Up Approach of Project Execution ......................................................... 207
Narra Venkata Ramana, Adma-Opco

Reservoir Fluid Analysis Using PVT Express ...................................................... 211

Maximizing Gas Recovery From Tight Gas Reservoirs in Trawick Field .................. 218
M.H. Meeks, K.D. Susewind, T.L. Templeman, ExxonMobil Production Co.

An Effective Horizontal Well Completion and Stimulation System ...................... 228
R. Seale, J. Athans, and D. Themig, Packers Plus Energy Services

New Methods for the Nonequilibrium Initialisation of Reservoir Models With Lateral and Vertical Variations in the Initial Fluid Composition ........................ 238
A. Gibson, Adco; H. Sørensen, Calsep A/S; and M. Abdou and I. Sener, Adco
Engineered Cement Set Control Additive—Solution for a Long Standing Cementing Challenge ................................................................. 390
Sara Moradi, Schlumberger; Peter Zonzee, Al Furat Petroleum Co.; and Depinder Sandhu, Hussein Elarda, Bipin Jain, and Jose Salazar, Schlumberger

New Parallel Algorithm for Multiple History-Matched Realizations .................................................. 399
D. Zubarev, Scandpower Petroleum Technology, and M. Kelkar, U. of Tulsa

Geomechanics Insight Into Discrepancies of Core to Image Log Discontinuities and Implications for a Lower Cretaceous Carbonate Field ................................................................. 411

A New Technique for Cementing Liners During Total Losses and Gas Influx Using a Foamed Cementing System.................................................................................. 419
C. Leuranguer and P. DeMestre, PDO, and A. AlFadhli and H. Xenakis, Halliburton

Evaluation of Activity Coefficient Models in Prediction of Wax Appearance Temperature ............................................................................................. 428
Ehsan Ghanaei, Feridun Esmaeilzadeh, and Jamshid Fathi Kajahi, Shiraz U.

Training—Maximising the Human Asset .............................................................................. 433
Ken Delve, Dascam Consulting

Effective Well and Reservoir Management Reverses Production Decline in a Major Brown Field in South Oman .................................................................................................. 439
Biswajit Choudhuri, Ibrahim Al-Qarshubi, Ehab Sadek, Sanjay Bharti and Salim Mahrooqi, Petroleum Development, Oman LLC

Eliminating Additional Drilling Expense Due to Well Stability Problem in Laminated/Fractured Nahr Umr Shale Formation ................................................................. 457
Tatsuhiko Waragai, Zadco; Koji Yamamoto, Jogmec; and Noriyuki Tokuda, Adma-Opco

Challenges, Lessons Learned, and Successful Implementations of Multilateral Completion Technology Offshore Abu Dhabi ........................................................................ 463
Shuichi Kikuchi and Abdul A. Fada’q, Zadco

Dynamic Production Optimization in Khafji Offshore Field ......................................................................... 476
E.O. Ghoniem, M.A. Al-Khaldi, N. Samizo, and A. Al-Thuwainy, Al-Khafji Joint Operations

Use of the NMR Diffusivity Log To Identify and Quantify Oil and Water in Carbonate Formations ........................................................................................................ 494

Volume 2

Restoring Well Integrity in a Critical Gas Pilot Injection Well ................................................................. 504
Jamal K. Al-Ashhab, Naeem Khan, and Douglas Boyd, Zakum Development Co.

Techniques Used to Monitor and Remove Strontium Sulfate Scale in UZ Producing Wells ........................................................................................................ 515
Jamal Al-Ashhab and Hasouneh Al-Matar, ZADCO, and Shahril Mokhtar, Schlumberger

Debottlenecking and Expansion of Upper Zakum GTP Plant at Zadco .................................................. 522
Sanjay Bhatia and Muhammed Fiaz, Zadco

Competency Management: Value, Approaches, and Challenges .................................................. 532
J.F. Brett, PetroSkills; M.G. Salah, PetroSkills Middle East; and Larry L. Lilly, J.M. Campbell and Co.

Evolution of Gas Bubbles From Offshore Wells .............................................................................. 544
C.O. Emenike, Ali Chareuf Afghoul, Nabil El Mzien, and Laid Latifi, Zadco
The Impact of Chloride Contamination From Leaking Heat Exchanger Tubes on Plant Materials of Construction
E.Y. El-Roubi, ADGAS; B. Kermani, KeyTech; and M. Selim Nasif, ADGAS

Tectonic History and Basement Fault Control on Structural Development of an Offshore Field, Abu Dhabi
Ewart Edwards, Hong Sit, Hamad Bu Al-Rougha, Akmal Sultan, and Naeema Khouri, Zakum Development Co.

Static and Dynamic Characterization of a Major Transtensional Fault Zone: Its Effect on Reservoir Quality and Deliverability From an Offshore Thamama Oil-Field in Abu Dhabi
Ewart Edwards, SPE, Zadco

Reliability of Cement Bond Log Interpretations Compared to Physical Communication Tests Between Formations
Douglas Boyd, Salah Al-Kubti, Osama Hamdy Khedr, Naeem Khan, and Kholoud Al-Nayadi, Zadco; Didier Degouy, Adma-Opco; and Antoine Elkadi and Zaid Al Kindi, Schlumberger

Strategic-Based Project Organization of Field-Development Activities
Ali Al Jarwan, Wallace W. (Bill) Martin, John Walters, Richard Smith, Qasem Al Kayoumi, and Hamad Bu Al Rougha, Zadco

Can the Existing F&G Detection System Provide Safe Guard Against All Possible Gas Releases? (Case Study)
Ashraf E. Shabaka, Zadco

The Role of Geomechanics at Early Stages of Field Development: A Case Study
Jorge S. Gomes, Maria Ribeiro, Shahin Neghaban, Yousef Dabbour, Jamal Bahmaish, and Georges Zaborowski, ADCO

Producing Dry Oil From a Transition Zone: Should This Be Called a Wedge Zone?
Mohamed Saleh Efnik, Hafez Hafez, Masoud Haajizadeh, Mohamed Hamawi, Maisoon Al-Mansori, and Maher Kenawy, Adco, and Faisal Abdulla, Adnoc

Miscible Gas Injection Piloting and Modeling in a Giant Carbonate Reservoir
Masoud Haajizadeh, Hafez H. Hafez, Rasheed Al Hassan, Abdulla Bakheet AlMatteeri, Mohamed N. Ghoozali, and Madher Kenawy, Adco

Uncertainty Analysis of a Giant Oil Field in the Middle East Using Surrogate Reservoir Model
Shahab D. Mohaghegh, West Virginia U. & Intelligent Solutions, Inc.; Hafez Hafez, ADCO; Razi Gaskari, WVU; and Masoud Haajizadeh and Maher Kenawy, ADCO

Production Well Testing Optimization Using Multiphase Flow Meters (MPFM)
M. Metwally Hassan and M. Bekkoucha, Adco, and M. Abukhader, Schlumberger

Maximizing Use of Well Log Acoustic Data To Define Seismic Attributes Leading to Better Development of a Mature Cretaceous Field in Abu Dhabi
Ashok Srivastava, SPE, Sandeep Chakravorty, and Kashif Malik, Schlumberger, and Fathy El Wazeer, SPE, and Martin Boekholt, Adco

Identification of Key Fracture Effects on Fluid Flow and Iterative Approach for Effective Permeability Modeling of a Matrix-Dominated Carbonate Reservoir, Offshore Abu Dhabi

Towards an Adco Real-Time Operations Centre (RTOC)
Adco ESP Pilot ................................................................. 686
   Hafsa A. Hashim, Adco

Clustering and Corridoring Project ........................................... 690
   Amjad Elabed, Luis Remisio, Khaliquzzaman Katchi, and Ihtisham Ur Rahim, Adco

Reservoir Fluid Sampling and Characterization—Key to Efficient Reservoir Management ........................................ 698

Unique Expandable Sand Screen and Expandable Liner Hanger Completion for Saudi Aramco ........................................ 708
   Zaki A. Al-Baggal and Ibrahim Refai, Saudi Aramco, and James W. Abbott, Halliburton Energy Services Inc.

Field Development Plan by Optioneering Process Sensitive to Reservoir and Operational Constraints and Uncertainties ............... 721
   E. Kasap, Schlumberger; G.J. Sanza and M.I. Ali, Petronas Carigali; T. Friedel, A. Waheed, A.Y. Sukmana, and A. Cuauro, Schlumberger; C. Cabrera, Consultant; and M.N.B. Rasol, Petronas Carigali

Remote Well Surveillance at an Adco Field .................................. 731
   Ameen Al-Hosani, Adco

Quantification of Fracture Permeability From Micro Resistivity Logs in Offshore Abu Dhabi Reservoir ....................................... 734
   Omar Al-Farisi, Mohamed Elhami, Abdul Naser Barkawi, Mariam Al-Marzouqi, Ghassan Al-Jefri, and Talal Kadada, Adma-Opco

Fracture Analysis for Carbonate Reservoirs Using 3D Seismic P-Wave Data: Middle East Case Study ........................................ 738
   David Y. Wang, Chih-Ping Lu, Wenjie Dong, Mary K. Johns, James M. DeGraff, and James H. Anderson, ExxonMobil Upstream Research Co.

P-Wave Azimuthal AVO in a Carbonate Reservoir: An Integrated Seismic Anisotropy Study ....................................................... 743

Application of Model-Based Uncertainty Analysis .......................... 752
   Li-Bong W. Lee, Glenn L. Krum, Tingting Yao, Robert C. Wattenbarger, and Lester H. Landis, ExxonMobil Upstream Research Co.

Reactive Transport Modeling of Carbonate and Siliciclastic Diagenesis and Reservoir Quality Prediction ................................... 757
   Yitian Xiao, ExxonMobil Upstream Research Co., and G.D. Jones, ExxonMobil Production Co.

Assisted Interpretation of Fiber-Optic Data for Smart-Well Completions ................................................................. 767
   Jim H. Lee, ExxonMobil Upstream Research Co.

Downdip Oil Potential for an Onshore Abu Dhabi Petroleum System ................................................................. 772

Opportunities and Challenges for Enhanced Recovery in the Middle East ................................................................. 781

New Hybrid Steam-Solvent Processes for the Recovery of Heavy Oil and Bitumen ................................................................. 791
   T.N. Nasr and O.R. Ayodele, Alberta Research Council
<table>
<thead>
<tr>
<th>Title</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>5K Dual Splitter Wellhead System: 1st Middle East Deployment on an Offshore Oilfield, Combining Simultaneous Production and Drilling on Adjacent Wells Within the Same Conductor</td>
<td>808</td>
</tr>
<tr>
<td>A. Santos and A. Floch, Total ABK</td>
<td></td>
</tr>
<tr>
<td>Simulation of Microbial Enhanced Oil Recovery</td>
<td>817</td>
</tr>
<tr>
<td>M.R. Ghadimi Gheshlaghi, Natl. Iranian Oil Co., and M. Ardjmand, Islamic Azad U. of Tehran</td>
<td></td>
</tr>
<tr>
<td>Screening of Field Development Options by Simulation Study To Improve Recovery From Lower Southern Units of Complex Carbonate Reservoir</td>
<td>823</td>
</tr>
<tr>
<td>Zahid Bhatti, Shahin Negahban, and Mohamed Shuaib, Adco</td>
<td></td>
</tr>
<tr>
<td>Understanding a Reservoir: 3D Geological Modelling Using Scenario-Based Approach and Conventional Geostatistics, Onshore, UAE</td>
<td>830</td>
</tr>
<tr>
<td>Layla Saleh Al Muhair, Maria Teresa Ribeiro, Agung Dharmawan, and Mohamed Al Neaimi, Adco, and Jose Gregorio Rodriguez-Gonzalez, Schlumberger</td>
<td></td>
</tr>
<tr>
<td>Real-Time Image Data for Successful Horizontal Drilling in Carbonate Reservoirs Onshore Abu Dhabi, UAE</td>
<td>843</td>
</tr>
<tr>
<td>Maria Teresa Ribeiro, Mohamed Al Neaimi, Irfan Hendrawan, Sultan Karrani, Mohamed Ben Saad, Mohammed R. Ayoub, Kamal Zubair, Khalid Al Marzouqui, and Suaad Khoori, Adco</td>
<td></td>
</tr>
<tr>
<td>Adco Well Casing Cathodic Protection Project</td>
<td>851</td>
</tr>
<tr>
<td>Abdulla Al Marzouqi, Adco</td>
<td></td>
</tr>
<tr>
<td>Calculation of Phase Behavior of Asphaltene Precipitation by Using a New EOS</td>
<td>856</td>
</tr>
<tr>
<td>Integrated Management System—Implementing QHSE Into Projects From Beginning to End</td>
<td>864</td>
</tr>
<tr>
<td>Srijayan N. Iyer, AFOES Consultants</td>
<td></td>
</tr>
<tr>
<td>Avon 200 Paper <em>Sept 1 2006</em>.doc</td>
<td>870</td>
</tr>
<tr>
<td>Gordon Hillman, Bryan Kendig, and Dave Taylor, Rolls-Royce</td>
<td></td>
</tr>
<tr>
<td>Enhanced Gas-Saturation Determination in Abu Dhabi Offshore Reservoirs Through Integrated Pulsed and Thermal Neutron Log Approach</td>
<td>878</td>
</tr>
<tr>
<td>Mariam Al Marzouqi, Omar Al-Farisi, Mohammed Mostafa Amer, Ali Al-Habshi, and Espin Lund, Adma-Opco</td>
<td></td>
</tr>
<tr>
<td>Abu Dhabi Heterogeneous Carbonate: New Upscaling Approach of Detailed 3D Geological Model</td>
<td>882</td>
</tr>
<tr>
<td>Mohamed Elhami Elsaid, Adel Belgaied, Faisal Al-Ginibi, and Omar Al-Farisi, Adma-Opco</td>
<td></td>
</tr>
<tr>
<td>Integrating Seismic-Derived Porosity Into a Geocellular Model—A Case Study</td>
<td>887</td>
</tr>
<tr>
<td>Gary Mercado, Hidemasu Ikawa, Mohamed Elhami, and Adel Belgaied, ADMA-OPCO</td>
<td></td>
</tr>
<tr>
<td>Managing Sustainable Annulus Pressures (SAP) in Adco Field</td>
<td>890</td>
</tr>
<tr>
<td>Hasan Al Hosani, Adco</td>
<td></td>
</tr>
<tr>
<td>Commissioning of Northeast Bab (NEB) Development Project</td>
<td>898</td>
</tr>
<tr>
<td>Hisham Saadawi, Adco</td>
<td></td>
</tr>
<tr>
<td>Characterisation and Modelling of a Fractured Reservoir Using a Novel DFN Approach</td>
<td>905</td>
</tr>
<tr>
<td>F. Gouth and A. Toublanc, Total, and M. Mresah, CPTL</td>
<td></td>
</tr>
<tr>
<td>Chemical Automation: A Part of the Well-Centric Production Optimization Loop</td>
<td>915</td>
</tr>
<tr>
<td>Jaedong Lee, Guy Vachon, Patricia Vega, and Mitch Means, Baker Hughes</td>
<td></td>
</tr>
</tbody>
</table>
Improving Structural and Stratigraphic Analysis Using Subsurface Residual Anomaly Maps: Case Study from Arabian Platform

AbdulMotealeb Al-Qahtani and Emad Al-Muzaeyen, Saudi Aramco

Innovative Well Testing System for High Rate Sour Gas Khuff Well in the North Field, Qatar

M. Al Hajri, Dolphin Energy Ltd.; B. Macdonald, Occidental Petroleum Co.; and P. Marcellin and E. Segui, TOTAL S.A.

Risk Management/Functional Safety: A Practical Approach for End Users and System Integrators

Valentino Vande Capelle, HIMA Middle East FZE, and Michel Houtermans, Risknowlogy

Jet Pump Performance With Secondary Fluids Differ in Density and Viscosity From Primary Fluid

Hesham A.M. Abdou, Agiba Petroleum Co., and S. Mikhail and Mohsen Abou-Ellail, Cairo U.

Evolutionary Well-Construction Method That Challenges Convention

P.D. Howlett, M.T. Wardley, and C. Black, Caledus Ltd.; D. Reed, Senergy Ltd.; and G. Begg, Talisman U.K. Ltd.

3D Managed-Pressure Drilling Around a Salt Dome Using Coiled Tubing: A Case Study—Challenges and Solutions

Shaikh Abdul Mujeeb Abdul Rehman, Maharashtra Inst. of Technology

Numerical Analysis of Radial Flow in a Natural Fracture: Applications in Drilling Performance and Reservoir Characterization

Alexandre Lavrov and Johan Tronvoll, Sintef Petroleum Research

Validation of a 16-in. Bulk Meter for Allocation Metering

Salim Al-Sibani, PDO, and Daniel Sequeira, Haimo Technologies

Nanologging: Use of Nanorobots for Logging

Pratyush Singh and Sumit Bhat, Halliburton India

Pipeline Corrosion: Its Remote Detection and Corrosion Management

Manish Kumar Sinha, Indian School of Mines

Author Index