# TABLE OF CONTENTS

1. Screening and Evaluation of Some Environment-Friendly Mud Additives To Use in Water-Based Drilling Muds .............................1  
   M. Amanullah, CSIRO Petroleum

2. Moving Beyond Management System Descriptions To Achieve a Step Change in HSE Performance ..............................................10  
   K.W. Walters and J. Wallace, ExxonMobil

3. Oil and Gas Industry Guidance on Voluntary Sustainability Reporting .................................................................13  
   B. Boyle, BP, and S. Depraz, IPIECA

4. Environmental Challenges of Heavy Crude Oils: Management of Liquid Wastes .........................................................20  
   Jerry M. Neff, Neff & Assoc. LLC, and Randi Hagemann, Statoil Research Center

5. Operating in the Shadow of a Megalopolis .................................................................29  
   D.D. Dudics and L. Arsenault, Thums Long Beach Co.

6. A Need for Converting Produced Waters to Useable Waters .................................................................33  
   George H. Holliday, Holliday Environmental Services Inc.

7. Innovative and Interactive Produced-Water Information Resource ................................................................38  
   J.A. Veil, M.G. Puder, R.G. Sullivan, P.D. Richmond, and T.J. Kotek, Argonne Natl. Laboratory

8. Options and Costs for Off-site Disposal of Oil and Gas Exploration and Production Wastes .................................46  
   M.G. Puder and J.A. Veil, Argonne Natl. Laboratory

   Andrew L. Smith, Atkins

10. Mitigating Risks From Waste Subsurface Pressure Injection and Decline Analysis .................................................61  
    F.E. Fragachán, T.A. Shokanov, A.P. Ovalle, and K.G. Nolte, M-I Swaco

11. Application of Innovative Chemical and Mechanical Processing for Treatment of Difficult Production-Waste Sludge ..........................69  
    Jacquelyn F. Star, Unocal Indonesia Co.; Stephen Williams, M-I Swaco; Isham Sudardjat, Unocal Indonesia Co.; Roger Kidder, M-I Production Chemicals; and Darrell L. Gallup, Unocal Corp.
Integrity Assessment of Well Barrier Threatened by Increasing Casing Hanger Loads ................................................................. 74
Eivind H. Okstad, SINTEF, and Sigbjørn Sangesland, Norwegian U. of Science and Technology

Douglas F. Scott, Spokane Research Laboratory/NIOSH, and Paul E. Lecoq, Gonzaga U.

Practical Application of Safety Cultures .................................................. 84
Danny Spadaccini and Scott Robinson, Weatherford

Integrating Safety Leadership and Cultural Change .................................. 89
George Siokos, Enterprise Development Network, and John Karish, Ensco Intl. Inc.

How to Move From Excellent to Extraordinary Safety .................................. 94
Larry Russell, Behavioral Science Technology

Reducing Road Traffic Fatalities Through Driver Education: A Major Oil-Producing Company's Approach ........................................... 98
Seun Odunmbaku and Felix Obarewon, Elf Petroleum Nigeria Ltd.

Eliminating Disposal of Effluent Water to Pits and Utilizing the Water to Recharge an Ever-Falling Reservoir Pressure ...................................... 102
Riyad Quttainah and Waleed Al-Khamees, KOC, and Salman Ahmad Al-Qabandi

Using Water Maps for E&P Environmental Protection and Remediation........ 107
Val O. Kofoed and Paul Rollins, Willowstick Technologies LLC

The Possibility of Replacing Oil-Based Mud With the Environmentally Acceptable Water-Based Glycol Drilling Mud for the Iranian Fields .......... 110
Seyed Mohsen Samaei, and Koorosh Tahmasbi, Petroleum U. of Technology, Tehran, Iran

The Integration of HSE&C—Communities, Contractors, Operators, and Regulators ................................................................. 121
Rex Doyle, Epic Energy Resources, and Tad LeBlanc, Baker Energy

Use of Diatomaceous Materials for Heavy-Metal Recovery from Oil and Gas Produced Water .......................................................... 134
E.O. Obanijesu, E.O. Dada, and O.O. Bello, Ladoke Akintola U. of Technology, Ogbomoso, Nigeria

Eliminating Hammer Injuries in the Oil Field .................................................. 138
Brad Bull and Greg Neal, Halliburton

Spill Prevention, Control, and Countermeasure Plan Rule ............................ 142
George H. Holliday, Holliday Environmental Services Inc.
<table>
<thead>
<tr>
<th>Title</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Detection of Impacts in a Changing and Highly Variable World: The Case of a Floating Storage and Offloading (FSO) Unit in the Gulf of Paria (Venezuela)</td>
<td>147</td>
</tr>
<tr>
<td>J.J. Cruz-Motta, U. Simón Bolívar; Irene Petkoff, ConocoPhillips Latin America; and Eduardo Klein and Haymara Alvarez, U. Simón Bolívar</td>
<td></td>
</tr>
<tr>
<td>Mercury Removal System for Upstream Application: Experience in Treating Mercury from Raw Condensate</td>
<td>154</td>
</tr>
<tr>
<td>Premobilization: Equipment Integrity Strategy For Safety Assurance in a Company in Nigeria</td>
<td>162</td>
</tr>
<tr>
<td>Tersoo C. Gwaza, Shell Petroleum Development Co. Nigeria</td>
<td></td>
</tr>
<tr>
<td>Louisiana Orphaned Reserve Pit Cost Assessment</td>
<td>168</td>
</tr>
<tr>
<td>Adam Lewis, Travis Webre, and Andrew Wojtanowicz, LSU</td>
<td></td>
</tr>
<tr>
<td>Meeting the Environmental Challenges in Cementing</td>
<td>177</td>
</tr>
<tr>
<td>Ståle Håheim and W. Chrys Scoggins, BJ Services Co.; Stuart Lebo Jr., Borregaard Lignotec U.S.A.; and Rikke Ø. Pedersen, Hydro</td>
<td></td>
</tr>
<tr>
<td>Prevention of Back Injuries: Using an Ergonomic Evaluation Team To Customize Training and Identify Improvement</td>
<td>182</td>
</tr>
<tr>
<td>Joel Disatell and Tom Knode, Halliburton</td>
<td></td>
</tr>
<tr>
<td>Security Is Everybody's Business: Transforming Security Into a Core Business Practice in the SHE Model</td>
<td>185</td>
</tr>
<tr>
<td>Stephen B. Simmons and Albert J. Robb III, Exxon Mobil Corp.</td>
<td></td>
</tr>
<tr>
<td>Using Risk-Based Analysis to Identify Inspection Priorities</td>
<td>191</td>
</tr>
<tr>
<td>Stan Belieu, Nebraska Oil and Gas Conservation Commission; Scott Kell, Ohio Dept. of Natural Resources; Paul Jehn, Ground Water Protection Council; David Lowther, Coordinate Solutions Inc.; and Deborah Gillespie, Virtual Engineering Solutions Inc.</td>
<td></td>
</tr>
<tr>
<td>Reducing Incidents in Marine Personnel Transfer</td>
<td>199</td>
</tr>
<tr>
<td>Philip A. Strong, Reflex Marine Ltd.</td>
<td></td>
</tr>
<tr>
<td>Enhanced Thermal Desorption Process Can Extend Life of Base Oil and Reduce Energy Costs</td>
<td>206</td>
</tr>
<tr>
<td>Cindy C. Fang, Chevron Oronite, and Simon Seaton and William Shumway, Halliburton</td>
<td></td>
</tr>
<tr>
<td>Comparison of Stabilised/Solidified Mixes of Model Drill Cuttings Based on the North Sea and Red Sea Areas</td>
<td>216</td>
</tr>
<tr>
<td>M.S. Al-Ansary and A. Al-Tabbaa, Cambridge U.</td>
<td></td>
</tr>
<tr>
<td>Focused Oilfield-Specific Training Reduces Accident Costs by Over 10 Times</td>
<td>238</td>
</tr>
<tr>
<td>George Chedsey, Center for Transportation Safety, and Donald Kaminski and Jeff Kaufmann, BJ Services Co. U.S.A.</td>
<td></td>
</tr>
</tbody>
</table>
Barium Sulfate: A Protocol for Determining Higher Site-Specific Barium Cleanup Levels .................................................................244
   Jim McGinty, Halliburton; Thomas E. McHugh, D.A.B.T.; and Elaine A. Higgins, Groundwater Services Inc.

Mapping and Monitoring the Petroscape in Venezuela’s Heavy-Oil Belt With Landsat and CBERS Satellite Images ..................................250
   Chris W. Baynard, U. of Florida

Environmental Management in Engineering and Projects .................................................................264
   Jesper Dahl Frederiksen, Maersk Contractors, Denmark

Maintaining Observer Skills Through an Effective Coaching Structure ...........................................267
   Paula Whitney and Harold Christian Schafer, Halliburton

Making Personal Responsibility for Safety Work to Create Change ...........................................273
   Kenneth A. Lang, Derek Allan, and Tracey Adam, Baker Hughes INTEQ, and Vanessa Chew, Live Wire Productions

Predicted Impacts From Offshore Produced-Water Discharges on Hypoxia in the Gulf of Mexico .................................................................279

The Development and Trial Use of Oil Exploration Drill-Cutting Waste as an Aggregate Replacement in Cold-Mix Asphalt .................................................................293
   Bob Allen, Aggregate Industries; Dennis Day and Stephen Armstrong, Nynas UK AB; Paul Page and Keith Murdoch, BP Exploration; and Ron Beardsley, Shetland Islands Council

Evaluation of the Potential for Gas and CO2 Leakage Along Wellbores ...........................................299

Contingency Planning Considerations for E&P Operations Near Mexican Territorial Waters .................................................................315
   David R. Pertuz, Det Norske Veritas U.S.A. Inc.

Continuous Ion Exchange for Wyoming CBM Produced-Water Purification: Proven Experience .................................................................321
   R.S. Dennis, Severn Trent Services Inc.

Working Hard To Work Hard Safely .................................................................325
   Nicolle Mode and George A. Conway, Natl. Inst. for Occupational Safety and Health

Implementation of a Management System Execution Framework to Establish a Culture of Accountability and Improved Safety Performance .................................................................329
   Michael F. Cadigan, Premium Drilling Inc., and Joe Stough, Syntex Management Systems Inc.
OGP Land Transport Safety Recommended Practice: An Industry Standard for Land Transport Safety .................................................................335  
Derek Tate, Schlumberger

Treatment of Hydrocarbon-Based Drilling Waste Using Supercritical Carbon Dioxide ..................................................................................341  
C.G. Street, C. Tesche, and S.E. Guigard, U. of Alberta

Adapting International SE Management Systems for Use in the Gulf of Mexico .........................................................................................348  
Rebecca Day and Nathaniel J. Teti, Sutherland Asbill & Brennan LLP, and Caroline J. Deetjen, DNV Energy

Using PDA Technology for Health, Environmental, and Safety Process Improvement ..................................................................................353  
D.D. Dudics, W.P. O’Toole, and M. Schmilen, Thums Long Beach Co.

An Innovative Utilization of Drilling Wastes as Building Materials ..................................................................................................................357  

Road Map to Establishing Effective Shared Environmental Governance ..................................................................................................366  
S.A. Haider, K.M. Al-Khamees, and A. Zaher, Kuwait Oil Co., and S. Al-Yakoob, The Knowledge Management Center

Environmental Management System Developments by the E&P Industry .................................................................................................373  
Susan T. Rost, Environmental Management Strategy, and Aston A. Hinds, Halliburton Co.