## Contents

The Technical and Editorial Committee viii  
Preface x  

The Petroleum Geology of NW Europe: 50 years of learning – a platform for present value and future success.  
An overview  
*B. Levell & M. Bowman*  1  

### Plays and Fairways

Tectonostratigraphic framework and depositional history of the Cretaceous–Danian succession of the Danish Central Graben (North Sea) – new light on a mature area  

Multiple episodes of regional exhumation and inversion identified in the UK Southern North Sea based on integration of palaeothermal and palaeoburial indicators  
*P. F. Green, I. R. Duddy & P. Japsen*  47  

3D basin and petroleum system modelling of the NW German North Sea (Entenschnabel)  
*J. Arfai & R. Lutz*  67  

New insights into the unexploited reservoir potential of the Mid North Sea High (UKCS quadrants 35–38 and 41–43): a newly described intra-Zechstein sulphate–carbonate platform complex  
*S. Patruno, W. Reid, C. A.-L. Jackson & C. Davies*  87  

Regional study of controls on reservoir quality in the Triassic Skagerrak Formation of the Central North Sea  

Regional distribution and controls on the development of post-rift turbidite systems: insights from the Paleocene of the eastern North Viking Graben, offshore Norway  
*E. Dmitrieva, C. A.-L. Jackson, M. Huuse & I. A. Kane*  147  

Old challenges, new developments and new plays in Irish offshore exploration  
*P. M. Shannon*  171  

Petroleum systems and results of exploration on the Atlantic margins of the UK, Faroes & Ireland: what have we learnt?  
*I. C. Scotchman, A. G. Doré & A. M. Spencer*  187  

Deep structure of the Porcupine Basin from wide-angle seismic data  

Challenges of future exploration within the UK Rockall Basin  

Exploration challenges along the North Atlantic volcanic margins: the intra-volcanic sandstone play in subsurface and outcrop  
*M. Larsen, B. Bell, P. Guarnieri, H. Vosgerau & R. Weibel*  231  

Controls on the reservoir quality of Late Cretaceous Springar Formation deep-water fan systems in the Voring Basin  
*A. Finlayson, A. Melvin, A. Guise & J. Churchill*  247
Play Assessment
The challenge of unbiased application of risk analysis towards future profitable exploration
G. P. Citron, P. Jeffrey Brown, J. MacKay, P. Carragher & D. Cook 259

Exploration well failures from the UK North Sea
C. J. H. Mathieu 267

The edges of the wedges: a systematic approach to trap definition and risking for stratigraphic, combination and sub-unconformity traps
E. J. Stirling, E. M. G. Fugelli & M. Thompson 273

Recent Successes and Learnings from Failures
New exploration discoveries in a mature basin: offshore Denmark

Petroleum geology of the Cygnus gas field, UK North Sea: from discovery to development
R. Catto, S. Taggart & G. Poole 307

The Bacchus development: dealing with geological uncertainty in a small high-pressure–high-temperature development
P. Rose, G. Byerley & O. Vaughan 319

The 35/9-7 Skarfjell discovery: a genuine stratigraphic trap, NE North Sea, Norway

Rhyl Field: developing a new structural model by integrating basic geological principles with advanced seismic imaging in the Irish Sea
G. Ward & D. Baker 355

The influence of volcanic rocks on the characterization of Rosebank Field – new insights from ocean-bottom seismic data and geological analogues integrated through interpretation and modelling
S. Poppitt, L. J. Duncan, B. Preu, F. Fazzari & J. Archer 373

The Lancaster Field: progress in opening the UK’s fractured basement play
A. Belaidi, D. A. Bonter, C. Slightam & R. C. Trice 385

Infrastructure-led Exploration and Development
A hydrodynamic model and associated spill-point map for the Huntington Field, UK Central North Sea
S. Green, S. O’Connor, R. Swarbrick & K. Waters 399

Lateral accretion in a straight slope channel system: an example from the Forties Sandstone of the Huntington Field, UK Central North Sea
C. Edwards, S. McQuaid, S. Easton, D. Scott, A. Couch, R. Evans & S. Hart 413

The Shearwater Field – understanding the overburden above a geologically complex and pressure-depleted high-pressure and high-temperature field

The Knarr Field: a new development at the northern edge of the North Sea
S. S. Skarpeid, J. M. Churchill, J. P. J. Hilton, C. N. Izatt & M. T. Poole 445

Beyond Laggan–Tormore: maximizing economic recovery from gas infrastructure West of Shetland
P. Noel & N. Taylor 455
Late-life Fields, Redevelopment and the Next Life
Unlocking 4D seismic technology to maximize recovery from the pre-salt Rotliegend gas fields of the Southern North Sea
J. Brain, T. Lassaigne, M. Darnet & P. Van Loeveijn 465

Re-saturation targets identified from 4D seismic softening responses in the Forties Field
L. Singer, G. Byerley & P. Rose 473

Aviat: a Lower Pleistocene shallow gas hazard developed as a fuel gas supply for the Forties Field

The Beryl Field area: increasing production in a mature asset
J. Pyle, G. Farquharson, J. Gibson, D. Helgeson & J. Towart 507

Spectral decomposition: an aid in characterizing field architectures of the Laggan and Tormore fields, Faroe–Shetland Basin
K. A. Wright, R. Nice, M. Tazzi, K. Purnell & V. Penasse 525

Future directions in reservoir modelling: new tools and ‘fit-for-purpose’ workflows
M. Bentley & P. Ringrose 537

Goldeneye: Tomorrow Never Dies (or a field Only Lives Twice)

North Sea – next life: extending the commercial life of producing North Sea fields
J. Gluyas, S. Mathias & S. Goudarzi 561

Onshore Exploration and Development
Shale prospectivity onshore Britain
A. L. Harvey, I. J. Andrews & A. A. Monaghan 571

The application of elemental geochemistry to UK onshore unconventional plays
D. A. Riley, T. J. Pearce, E. Mathia, K. Ratcliffe & J. Martin 585

An assessment of the Upper Succession and the related secondary reservoirs in the Welton Field, onshore UK
J. Steventon & M. Bowman 595

The unconventional Carboniferous reservoirs of the Greater Kirby Misperton gas field and their potential: North Yorkshire’s sleeping giant
F. Hughes, D. Harrison, M. Haarhoff, P. Howlett, A. Pearson, D. Ware, C. Taylor, G. Emms & A. Mortimer 611

Index 627