

Contents

VOLUME 1

Conference Organizing Committee xii

Conference Technical Committee xii

Sponsoring Bodies xii

Foreword xiii

Jim Brooks

General Introduction xiv

A. J. Fleet and S. A. R. Boldy

Regional syntheses, tectono-stratigraphic analyses and structural studies

Introduction and review 3

J. R. Underhill

Palaeozoic to Tertiary rift and basin dynamics: mid-Norway to the Bay of Biscay – a new context for hydrocarbon prospectivity in the deep water frontier 7

D. G. Roberts, M. Thompson, B. Mitchener, J. Hossack, S. Carmichael and H-M Bjørnseth

Principal tectonic events in the evolution of the northwest European Atlantic margin 41

A. G. Doré, E. R. Lundin, L. N. Jensen, Ø. Birkeland, P. E. Eliassen and C. Fichler

The evolution of the Central North Sea Rift 63

D. Erratt, G. M. Thomas and G. R. T. Wall

Evolution of extensional styles at the southern termination of the Nordland Ridge, mid-Norway: a response to variations in coupling above Triassic salt 83

R. Pascoe, R. Hooper, K. Storhaug and H. Harper

Processes and products of footwall degradation, northern Brent Field, Northern North Sea 91

A. E. McLeod and J. R. Underhill

The Zeta Structure: a footwall degradation complex formed by gravity sliding on the western margin of the Tampen Spur, Northern North Sea 107

M. Berger and A. M. Roberts

The origin and genesis of major Jurassic unconformities within the triple junction area of the North Sea, UK 117

R. J. Davies, D. O'Donnell, P. N. Bentham, J. P. C. Gibson, M. R. Curry, R. E. Dunay and J. R. Maynard

Tectono-stratigraphic development of the southern part of UKCS Quadrant 15 (eastern Witch Ground Graben): implications for the Mesozoic–Tertiary evolution of the Central North Sea Basin 133

G. Jones, P. Rorison, R. Frost, R. Knipe and J. Collieran

Middle Oxfordian to Volgian sequence stratigraphy of the Greater Shearwater area 153

J. M. Jeremiah and P. H. Nicholson

Laramide events: Mid North Sea High (UK Quadrants 38 & 39) 171

H. Johnson, M. F. Quinn, J. Bulat and D. Long

Impact of salt on the structure of the Central North Sea hydrocarbon fairways 179

S. A. Stewart and J. A. Clark

Rift–raft tectonics: examples of gravitational tectonics from the Zechstein basins of northwest Europe 201

J. Penge, J. W. Munns, B. Taylor and T. M. F. Windle

4D evolution of segmented strike-slip fault systems: applications to NW Europe 215

T. Dooley, K. McClay and M. Bonora

Atlantic margin: offshore Norway to offshore Ireland

- Introduction and review 229
P. M. Shannon and A. M. Spencer
- Petroleum systems of the Atlantic margin of northwest Europe 231
A. M. Spencer, Ø. Birkeland, G. Ø. Knag and R. Fredsted
- Structural elements and petroleum geology of the Norwegian sector of the northern Barents Sea 247
P. Grogan, A.-M. Østvedt-Ghazi, G. B. Larssen, B. Fotland, K. Nyberg, S. Dahlgren and T. Eidvin
- The prospectivity of the Voring and Møre basins on the Norwegian Sea continental margin 261
H. Brekke, S. Dahlgren, B. Nyland and C. Magnus
- The first deepwater well in Norway and its implications for the Upper Cretaceous Play, Vøring Basin 275
J. E. Kittilsen, R. R. Olsen, R. F. Marten, E. K. Hansen and R. R. Hollingsworth
- Techniques used in the exploration of turbidite reservoirs in a frontier setting – Helland Hansen licence, Vøring Basin, offshore mid Norway 281
F. Sanchez-Ferrer, S. D. James, B. Lak and A. M. Evans
- Cenozoic development of the Norwegian margin 60–64°N: sequences and sedimentary response to variable basin physiography and tectonic setting 293
O. J. Martinsen, F. Boen, M. A. Charnock, G. Mangerud and A. Nottvedt
- Oil seepage onshore West Greenland: evidence of multiple source rocks and oil mixing 305
J. A. Bojesen-Koefoed, F. G. Christiansen, H. P. Nytoft and A. K. Pedersen
- West Greenland versus Vøring Basin: comparison of two deepwater frontier exploration plays 315
R. B. Aram
- Cretaceous (post-Valanginian) sedimentation and rift events in NE Greenland (71–77°N) 325
A. G. Whitham, S. P. Price, A. M. Koraini and S. R. A. Kelly
- Sandstone wedges of the Cretaceous–Lower Tertiary Kangerlussuaq Basin, East Greenland – outcrop analogues to the offshore North Atlantic 337
M. Larsen, L. Hamberg, S. Olaussen, T. Preuss and L. Stemmerik
- Early Tertiary heat flow along the UK Atlantic margin and adjacent areas 349
P. F. Green, I. R. Duddy, K. A. Hegarty and R. J. Bray
- Evidence for pre-Cretaceous rifting in the Rockall Trough: a quantitative analysis using plate tectonic modelling 359
J. Cole and J. Peachey
- Evidence for pre-Cretaceous rifting in the Rockall Trough: an analysis using quantitative 2D structural/stratigraphic modelling 371
P. A. Nadin, M. A. Houchen and N. J. Kusznir
- The regional geology and exploration potential of the NE Rockall Basin 379
P. Waddams and T. Cordingley
- The Northeast Rockall Basin and its significance in the evolution of the Rockall–Faeroes/East Greenland rift system 391
M. P. Tate, C. D. Dodd and N. T. Grant
- The structural and stratigraphic framework of the Irish Rockall Trough 407
S. Corfield, N. Murphy and S. Parker
- Structural setting, geological development and basin modelling in the Rockall Trough 421
P. M. Shannon, A. W. B. Jacob, B. M. O'Reilly, F. Hauser, P. W. Readman and J. Makris
- Petroleum geology of the Irish Rockall Trough – a frontier challenge 433
A. Walsh, G. Knag, M. Morris, H. Quinquis, P. Tricker, C. Bird and S. Bower
- Structural evolution of the Slyne Trough 445
P. N. Dancer, S. T. Algar and I. R. Wilson
- The structural evolution of the Erris Trough, offshore northwest Ireland, and implications for hydrocarbon generation 455
T. J. Chapman, T. M. Broks, D. V. Corcoran, L. A. Duncan and P. N. Dancer

Jurassic non-marine source rocks and oils of the Porcupine Basin and other North Atlantic margin basins <i>P. Butterworth, A. Holba, S. Hertig, W. Hughes and C. Atkinson</i>	471
Comparative Jurassic and Cretaceous tectono-stratigraphy and reservoir development in the Jeanne d'Arc and Porcupine basins <i>B. P. J. Williams, P. M. Shannon and I. K. Sinclair</i>	487
Sedimentary basins and petroleum systems offshore Newfoundland and Labrador <i>N. R. DeSilva</i>	501
The Hibernia Oilfield – effects of episodic tectonism on structural character and reservoir compartmentalization <i>I. K. Sinclair, J. E. Evans, E. A. Albrechtsons and L. J. Sydora</i>	517
Atlantic margin: Faeroe–Shetland	
Introduction and review <i>B. Levell and M. Thompson</i>	531
Rifting and the development of the Faeroe–Shetland Basin <i>K. Dean, K. McLachlan and A. Chambers</i>	533
Palaeogene magmatism in the Faeroe–Shetland Basin: influences on uplift history and sedimentation <i>P. H. Naylor, B. R. Bell, D. W. Jolley, P. Durnall and R. Fredsted</i>	545
Stratigraphic relationships of the Lower Tertiary of the Faeroe Basalt Plateau and the Faeroe–Shetland Basin <i>L. Kiørboe</i>	559
Early Tertiary magmatism in the offshore NW UK margin and surrounds <i>J. D. Ritchie, R. W. Gatliff and P. C. Richards</i>	573
The thermal impact of Paleocene magmatic underplating in the Faeroe–Shetland–Rockall region <i>P. D. Clift</i>	585
Reconciling gravity and seismic data in the Faeroe–Shetland Basin, West of Shetland <i>W. Ashcroft, A. Hurst and C. J. Morgan</i>	595
The importance of fluid pressures and migration to the hydrocarbon prospectivity of the Faeroe–Shetland White Zone <i>J. E. Iliffe, A. G. Robertson, G. H. F. Ward, C. Wynn, S. D. M. Pead and N. Cameron</i>	601
Hydrocarbon migration history, West of Shetland: integrated fluid inclusion and fission track studies <i>J. Parnell, P. F. Carey, P. Green and W. Duncan</i>	613
Reservoir quality and petrophysical evaluation of Paleocene sandstones in the West of Shetland area <i>M. Sullivan, T. Coombes, P. Imbert and C. Ahadamach-Demars</i>	627
Anisotropy and amplitude versus offset: a case history from the West of Shetlands <i>R. W. Margesson and C. H. Sondergeld</i>	635
The Paleocene deepwater sandstone play West of Shetland <i>E. Lamers and S. M. M. Carmichael</i>	645
The Turonian play in the Faeroe–Shetland Basin <i>N. Grant, A. Bouma and A. McIntyre</i>	661
The Foinaven Field: managing reservoir development uncertainty prior to start-up <i>M. M. Cooper, A. C. Evans, D. J. Lynch, G. Neville and T. Newley</i>	675
The Schiehallion development <i>H. M. Leach, N. Herbert, A. Los and R. L. Smith</i>	683
Solan, Strathmore and the back basin play, West of Shetland <i>R. Herries, R. Poddubiuk and P. Wilcockson</i>	693

The Victory gas field, West of Shetland	713
<i>M. W. Goodchild, K. L. Henry, R. J. Hinkley and S. W. Imbus</i>	
Appendix: a list of common abbreviations	xv
Index	xvii

VOLUME 2

The Carboniferous of the Southern North Sea

Introduction and review	727
<i>R. E. Dunay and S. S. Flint</i>	
Reservoirs of the Dinantian (Lower Carboniferous) play of the Southern North Sea	729
<i>J. R. Maynard and R. E. Dunay</i>	
Regional correlation of Westphalian sandbodies onshore UK: implications for reservoirs in the Southern North Sea	747
<i>J. F. Aitken, D. G. Quirk and P. D. Guion</i>	
Continent-scale sequence stratigraphy of the Namurian, Upper Carboniferous and its applications to reservoir prediction	757
<i>S. Davies, G. Hampson, S. Flint and T. Elliott</i>	
Incised valley fill sandstone bodies in Upper Carboniferous fluvio-deltaic strata: recognition and reservoir characterization of Southern North Sea analogues	771
<i>G. J. Hampson, S. J. Davies, T. Elliott, S. S. Flint and H. Stollhofen</i>	
Structural analysis of 3D seismic data, using the correlation attribute: a case study – Carboniferous of the Southern North Sea (UK)	789
<i>S. Birrell and J. Courtier</i>	
‘NW European Gas Atlas’ – new implications for the Carboniferous gas plays in the western part of the Southern Permian Basin	799
<i>P. Gerling, M. C. Geluk, F. Kockel, A. Lokhorst, G. K. Lott and R. A. Nicholson</i>	
The Trent Gas Field: correlation and reservoir quality within a complex Carboniferous stratigraphy	809
<i>P. T. O’Mara, M. Merryweather, M. Stockwell and M. M. Bowler</i>	

Jurassic subtle traps

Introduction and review	825
<i>S. A. R. Boldy and S. I. Fraser</i>	
Controls on Late Jurassic, subtle sand distribution in the Tampen Spur area, Northern North Sea	827
<i>N. H. Dawers, A. M. Berge, K-O Häger, C. Puigdefabregas and J. R. Underhill</i>	
Sequence stratigraphy and sedimentary history of the Humber Group (Late Jurassic–Ryazanian) in the Outer Moray Firth (UKCS, North Sea)	839
<i>D. Kadolsky, S. J. Johansen and S. Duxbury</i>	
Downthrown closures of the Outer Moray Firth	861
<i>B. A. Moseley</i>	
Controls on Upper Jurassic sediment distribution in the Durward–Dauntless area, UK Blocks 21/11, 21/16	879
<i>S. A. Stewart, S. I. Fraser, J. A. Cartwright, J. A. Clark and H. D. Johnson</i>	
Upper Jurassic basin axial turbidites within the Gertrud Graben, Danish Central Graben	897
<i>E. S. Rasmussen, A-M. Jepsen and K. G. Møller</i>	

Chalk renaissance

Introduction and review	909
<i>S. A. R. Boldy</i>	

Chalk exploration, the search for a subtle trap	911
<i>N. P. Bramwell, G. Caillet, L. Meciani, N. C. Judge, M. Green and P. Adam</i>	
The capabilities and challenges of the seismic method in chalk exploration	939
<i>J. K. Anderson</i>	
Influence of syn-depositional faulting on thickness variations in chalk reservoirs – Valhall and Hod fields	949
<i>C. L. Farmer and O. I. Barkved</i>	
Exploration and appraisal of the South Arne Field, Danish North Sea	959
<i>D. S. Mackertich and D. R. G. Goulding</i>	
Banff Field, UK Central Graben – evaluation of a steeply dipping, fractured chalk reservoir	975
<i>N. Evans, P. Rorison and G. Sykes</i>	

High pressure/high temperature plays

Introduction and review	991
<i>B. Levell</i>	
A subsurface perspective on ETAP – an integrated development of seven Central North Sea fields	993
<i>J. Pooler and M. Amory</i>	
The Elgin and Franklin fields: UK Blocks 22/30c, 22/30b and 29/5b	1007
<i>J. Lasocki, J.-M. Guemene, A. Hedayati, C. Legorjus and W. M. Page</i>	
Shearwater prospect development: a high pressure/high temperature challenge	1021
<i>J. F. Blehaut, F. van Beek, C. Billeau, J. K. Gause, S. Kimminau, A. Paardekam, N. Radcliffe, R. Rademaker, L. Storms, B. J. Welsh and A. Wittemann</i>	
Structural development and trap formation in the Central North Sea HP/HT play	1029
<i>D. E. Helgeson</i>	

Integrated field development and reservoir management

Introduction and review	1037
<i>S. S. Flint and H. D. Johnson</i>	
The Brent Field: improving subsurface characterization for late field life management	1039
<i>S. James, D. Pronk, F. Abbots, V. Ward, A. van Dierendonck and D. Stevens</i>	
Application of 3D visualization and VSP for horizontal well positioning – 9/13a-N1 case history, Nevis Field, UKCS	1051
<i>A. J. Dickson, G. C. Bingham, G. C. Stylianides, H. W. A. Thompson and N. A. Way</i>	
Tern Field development: a marriage of new technologies for business benefit	1063
<i>R. C. Black, H. J. Poelen, M. J. Roberts and S. E. Roddy</i>	
Integrating sequence stratigraphy in field development and reservoir management – the Telford Field	1075
<i>R. M. Symms, D. F. Savory, C. J. Ward, C. C. Ebdon and A. Griffin</i>	
Fulmar: a mature field revisited	1089
<i>P. Spaak, J. Almond, S. Salahudin, Z. Mohd Salleh and O. Tosun</i>	
Reservoir characterization in the Captain Field: integration of horizontal and vertical well data	1101
<i>P. T. S. Rose</i>	
Britannia Field, UK Central North Sea: modelling heterogeneity in unusual deep-water deposits	1115
<i>L. S. Jones, S. W. Garrett, M. Macleod, M. Guy, P. J. Condon and L. Notman</i>	
Innovation and risk management in a small subsea-tieback: Arkwright Field, Central North Sea, UK	1125
<i>J. D. Kantorowicz, I. J. Andrews, S. Dhanani, M. Gillis, C. Jennings, P. J. Lumsden, G. Orr, R. W. Simm and J. Williams</i>	
The reservoir development of the Fife Field	1135
<i>S. Currie, S. Gowland, A. Taylor and M. Woodward</i>	

Ekofisk Field redevelopment: improved reservoir management through cross-discipline technology and integration of three dimensional models 1147
S. C. Key, B. Agarwal, G. V. Soiland and H. H. Nielsen

Reservoir management of the Wytch Farm Oil Field, Dorset, UK: providing options for growth into later field life 1157
A. J. C. Hogg, I. J. Evans, P. F. Harrison, T. Meling, G. S. Smith, S. D. Thompson and G. F. T. Watts

Reservoir studies

Introduction and review 1175
A. Hurst

Characterization of fault zones in the Gullfaks Field for reservoir modelling 1177
G. Yielding, J. A. Øverland and G. Byberg

High resolution zonation within a tide-dominated deltaic reservoir: the Middle Jurassic Beryl Formation, Beryl Field, UKCS 1187
G. Maxwell, A. Hartley and J. Crane

Capturing reservoir heterogeneity in a sand-rich submarine fan, Miller Field 1199
C. R. Garland, P. Haughton, R. F. King and T. P. Moulds

Integrated reservoir characterization and uncertainty analysis, Heidrun Field, Norway 1209
T. Olsen, K. J. Rosvoll, J. M. Kjærefjord, D. M. Arnesen, C. Sandsdalen, S. H. Jørgenvåg, V. Langlais and K. E. Svela

An integrated approach to hydrocarbon emplacement in chalk, Norwegian North Sea Central Graben 1221
I. E. I. Øxnevad and M. S. G. Taylor

Applications of geophysical technology

Introduction and review 1233
J. W. Munns

Strathspey vertical-cable seismic survey: a North Sea first 1235
P. E. Leach

Faroes Large Aperture Research Experiment (FLARE): imaging through basalt 1243
R. S. White, J. Fruehn, K. R. Richardson, E. Cullen, W. Kirk, J. R. Smallwood and C. Latkiewicz

Exploring the Shetland–Faeroes Basin using wide-angle seismic technology 1253
P. J. Barton, S. Hughes, C. Zelt and R. Masotti

Three-component 3D borehole profile imaging program on Ekofisk Field 1255
H. H. Nielsen, J. Dangerfield, S. C. Key, G. V. Soiland and L. Berg

Rock physics and quantitative wavelet estimation for seismic interpretation: Tertiary North Sea 1265
R. W. Simm, S. Xu and R. E. White

Seismic inversion as a vehicle for integration of geophysical, geological and petrophysical information for reservoir characterization: some North Sea examples 1271
J. J. M. Buiting and M. Bacon

Predicting sandbody distribution and porosity for Callovian to late Oxfordian succession; Block 9/13 UKCS: an integrated approach 1281
M. Wood, G. Bingham and P. Mitchell

A, B AVO cross plotting and its application in Greenland and the Barents Sea 1289
E. S. Isaacson and D. B. Neff

Applications of the coherency cube in the UKCS 1299
M. J. Hughes, S. Dhanani, R. K. Frimpong, M. Gainski, N. L. Haskell, R. P. Heath, J. D. Kantorowicz, P. M. Maguire and S. E. Nissen

Basin modelling applications in reducing risk and maximizing reserves

- Introduction and review 1309
S. D. Burley and I. C. Scotchman
- Charge and overpressure modelling in the North Sea: multi-dimensional modelling and uncertainty analysis 1313
M. R. Giles, S. L. Indrelid, N. J. Kuszniir, A. Loopik, J. A. Meijerink, J. McNutt, P. Dijkstra, W. Heidug, J. Toth, M. Willis, K. Rutten, B. Elsinga, P. Huysse, P. Riviere, H. Bürgisser and E. Rowley
- Hydrocarbon systems modelling of the Norwegian Central Graben fairway trend 1325
M. S. G. Taylor, A. LeRoy and M. Førland
- Diagenetic porosity creation in an overpressured graben 1339
R. S. Haszeldine, M. Wilkinson, D. Darby, C. I. Macaulay, G. D. Couples, A. E. Fallick, C. G. Fleming, R. N. T. Stewart and G. McAulay
- The Jurassic petroleum system of the West of Britain Atlantic margin – an integration of tectonics, geochemistry and basin modelling 1351
A. J. Holmes, C. E. Griffith and I. C. Scotchman
- Petroleum systems analysis of the Paleocene play in the West of Shetland area 1367
R. Jowitt, A. Hindle, D. Jones and P. Rose
- Oil and gas migration in the Sherwood Sandstone of the East Irish Sea Basin 1383
G. Cowan, S. D. Burley, A. N. Hoey, P. Holloway, P. Bermingham, N. Beveridge, M. Hamborg and O. Sylta
- Appendix: a list of common abbreviations xiii
- Index xv