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Stephen Martin Corfield¹, Tom Dreyer², Steen Petersen², Rob Gawthorpe¹ (1) University of Manchester, Manchester, United Kingdom (2) Norsk Hydro Research Centre, Bergen, Norway

Integrated use of 3D Visualisation, Sedimentology and Seismic Modelling of Subtle Syn-rift plays on the West Flank of the Oseberg Field, Norwegian North Sea

Present production of hydrocarbons on the west flank of the Oseberg Field, Norwegian North Sea is from the Middle Jurassic Brent Group. However, there is evidence that considerable additional reserves exist in Upper Jurassic syn-rift marine sandstones in an area characterised by complex structural and stratigraphic traps. Recent work has revealed that the distribution of syn-rift sands is intimately related to the contemporaneous growth and linkage of extensional faults bounding tilted fault blocks on the terraced west flank of the field. Lateral and vertical growth of faults has also resulted in the development of fault propagation folds and emergent fault block crests. Sands are considered unlikely to be laterally extensive in such a complex setting and the seismic data indicate a variety of depositional environments ranging from attached shoreline systems to turbidites infilling large channels. Extensive use of 3D visualisation techniques (formation sculpting, voxel rendering, virtual reality) coupled with seismic modelling has been used to map the geometry and distribution of the syn-rift sandbodies. The combination of these technologies coupled with the integration of structural and stratigraphic models has led to an increased understanding of the interaction between fault growth and linkage with the eventual aim of delineating subtle syn-rift plays.