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Towards An Understanding of the Development of Salt-Related Overburden Structures in the Southern North Sea Basin, U.K.

by Robert J. Hooper, Conoco, Houston; John Colleran and Carol Gunn, Conoco, U.K.

The present-day structural configuration of the Mesozoic and younger section in the Southern North Sea Basin results from the complex interaction between extension, salt tectonics, inversion, and subsidence that began in the late Triassic and continued well into the Tertiary. Interpretation of high-resolution 3-D seismic data, combined with 2-D cross-section restorations and new insights into salt tectonics derived from scaled analog- and numerical-model experiments, has prompted a reevaluation of the development of salt-related structures in the basin. Several key aspects of the developmental history can be well explained using the concepts of diapiric rise and fall and inversion-related diapiric rejuvenation as derived from experimental data.

A wide variety of salt-related structures occur in the Southern North Sea Basin, including graben-diapir systems, salt walls, and salt swells and troughs. These structures, though physically very different, have similar development histories. Salt-related overburden structures in the basin are considered to result from thin-skinned, gravity-driven deformation that was responsible for triggering and controlling graben and diapir growth and for the selective later inversion of some diapirs. Additional structures were created by bending and vertical movements associated with extensionally driven diapiric collapse. The development of structures developed as a simple reaction to the thin-skinned extension and subsequent contraction of the overburden.

Biographical Sketch

Robert J. Hooper has been with Conoco in the capacity of Research Associate since 1991. His primary function is to serve as a consultant to worldwide exploration groups

on matters of structural geology, the interpretation of structures in seismic data, and regional tectonics. He is also involved in research into structural development in a wide variety of tectonic settings and monitors several external research programs. From 1984 to 1991, he was an Assistant Professor at the University of South Florida. He received a Ph.D. in geology from the University of South Carolina in 1986. Robert is a member of GSA and The Geological Society of London. ■