Salt Tectonics of the North Sea

Discipline: **Salt Tectonics, Structural Geology, Petroleum Systems**

Length: **2 days**

Instructor

Mark G. Rowan, PhD

Mark received a B.S. in biology from the California Institute of Technology in 1976, an M.S. in geology from the University of California, Berkeley, in 1982, and a Ph.D. in structural geology from the University of Colorado at Boulder in 1991. He worked for Sohio Petroleum Co. (1982 to 1985), Geo-Logic Systems (1985-1989), and Alastair Beach Associates in Glasgow, Scotland (1989-1992). He then returned to the University of Colorado as a Research Assistant Professor before founding his own company in 1998, where he consults and teaches for the petroleum industry worldwide and conducts research sponsored by industry.
Although Mark's background includes many types of tectonic environments, his primary research and consulting interests are focused on the styles and kinematics of salt tectonics, the processes of salt-sediment interaction, the architecture and evolution of passive margins, and the applications to petroleum exploration. He is the author or coauthor of over 80 papers and 170 abstracts, is the regular instructor for AAPG's Salt Tectonics school, and has been an AAPG Distinguished Lecturer and an AAPG International Distinguished Instructor.
has authored a number of patents. She is fluent in English, German, and Spanish, and proficient in French and Italian.

COURSE DESCRIPTION

This is a condensed version of the 4-day salt course that focuses on those aspects of salt tectonics relevant to the thick-skinned deformation of the North Sea and associated salt basins such as in Germany and Poland. The content ranges from the mechanics of salt-dominated deformation to the influence of salt on the petroleum systems, with surface and subsurface examples from many salt basins, but with an emphasis on the North Sea. Lecture material is supplemented with seismic-based exercises.

LEARNING OUTCOMES

After this course participants will be able to:
- appreciate the influence of the original salt distribution on structural styles
- interpret intrasalt geometries on seismic data
- describe the mechanics of salt flow

- explain how thick-skinned extension, plus loading and contraction, drove salt flow
- understand diapir rise and minibasin subsidence
- predict geometries and salt-sediment interaction in diapir-flank traps
- evaluate the relationships between crustal faulting and diapirism
- interpret seismic data while avoiding associated pitfalls due to complex salt bodies
- appraise the influence of salt on trap, reservoir, hydrocarbons, and seal

COURSE CONTENT

Salt basins
- 1.1. Layered evaporite sequences and their role on salt tectonics
- 1.2. Influence of rifting on Zechstein salt distribution

2. Fundamentals of salt tectonics
   - 2.1. Mechanics
   - 2.2. Definitions

3. Extensional salt tectonics
   - 3.1. Thin-skinned extension
   - 3.2. Diapir initiation and reactivation
   - 3.3. Thick-skinned extension
   - 3.4. Pod-interpod salt tectonics

4. Contractional salt tectonics
   - 4.1. Thin-skinned contraction
   - 4.2. Diapir initiation and reactivation
   - 4.3. Thick-skinned contraction

5. Vertical salt tectonics
   - 5.1. Salt-evacuation structures and minibasins
   - 5.2. Passive diapirism
   - 5.3. Near-diapir deformation
   - 5.4. Dissolution

6. Allochthonous salt tectonics

7. Salt and petroleum systems
   - 7.1. Trap
   - 7.2. Reservoir distribution and facies
   - 7.3. Hydrocarbon maturation and migration
   - 7.4. Seal