PE Limited

Engineering & Geological Software Development

Integrated Structural Geology – MOVE Advanced 2D Kinematic Modelling Course

Target Audience:

This course is intended for those that: (i) attended the ***Standard MOVE*** course previously; (ii) have consolidated their familiarity of ***MOVE*** through consistent use over time or; (iii) are geologists with structural geology experience. This course will assume a base level of familiarity of the tools, and is intended to promote the analytical features available and best-practice workflows for quantifying and minimizing geological uncertainties.

Overall Objectives:

1/ Develop dexterity in using the 2D Kinematic modelling tools in **MOVE;**
2/ Understand how to model deformational processes and critically assess geological models in 2D;
3/ Develop an understanding of the principles behind the modelling tools and hence their limitations;
4/ Understand the benefits of using Visual Workflows in ***RESOLVE*** for structural modelling and analysis.

Course Agenda

Day 1 Preparing data for structural analysis – data loading, conditioning and QC

Importance of structural geology modelling for reducing uncertainty in the reservoir model.
Preparing data for 2D structural analysis – loading data, defining rock properties, depth conversion.
Assumptions when modelling in 2D – material balance and honouring plane strain.
Conditioning and QC of geological interpretations.
Importance of initial observations – using input data to guide structural modelling decisions.
***Exercises** –Importing data into **MOVE**; setting-up stratigraphy table; Depth conversion; creating cross-sections, tidying interpretations and projecting data; Section analysis; Area-Depth calculation.*

Day 2 Validation of interpretations and testing conceptual models

Principles of kinematic modelling - Simple Shear, Fault Parallel Flow, Elliptical Fault Flow, Fault Bend Folding, Fault Propagation Folding, Trishear, Detachment Folding.
Constrained model building - using material balance and geological principles – predicting fault shapes, forward modelling and geometric restoration.
*Introduction to **RESOLVE –** using Visual Workflows to extend native **MOVE** functionality.*
***Exercises** – Geometric fault construction; forward-modelling deformation in 2D; geometric restoration.*

Day 3 Performing sequential restorations

Regional scale tectonic processes - Isostasy, thermal subsidence, mechanical compaction.
Burial History Analysis – understanding basin evolution and constraining input parameters.
Sequential Restoration - best practice workflows for restoring the effects of deformation through time.
***Exercises** – Airy and Flexural isostasy models; McKenzie thermal subsidence model; 1D burial history analysis; Sclater-Christie compaction model; Sequential Restoration in **MOVE** accounting for the effects of salt-related deformation.*

Day 4 Additional techniques to reduce uncertainty

Fault Triangle Diagrams – 1D fault seal analysis.
*Going from 2D to 3D– model building techniques available in **MOVE**.*
*Understanding uncertainty – further analysis, integration with **RESOLVE.***
Structural modelling in complex settings – salt tectonics.
***Exercises** – Fault triangle diagrams, model building, introduction to **RESOLVE**, case study exercises from a variety of tectonic settings.*

Day 5 Reservoir structural geology modelling workshop

*Use learnings from first four days to carry out best-practice 2D structural analysis in **MOVE**.*

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