PVT Modelling and Flow Assurance with Multiflash®

1.   Introduction

Tutor(s)

Course objectives

Training materials

2.   Multiflash fundamentals

Model fundamentals

Features of Multiflash

Choice of thermodynamic models

Choice of transport property models

3.   Flash calculations

Flash calculations

Fixed phase flash and tolerance calculations

Solid freeze-out for pure solids

Mercury partitioning

4.   Fluid Characterisation

Using data from a PVT report

Oil and condensate characterisation

Simultaneous characterisation of multiple fluids

Importing a characterised fluid into Multiflash

Component lumping/delumping

Flash calculations, dew points, phase envelopes

5.   PVT lab and fluids regression

EOS tuning and matching of properties

PVT experiments modelling and data regression

Sample QC

Mud decontamination

Multi-stage flash and recombination

6.   Natural gas hydrates and hydrates inhibition

Overview of gas hydrates

Gas hydrate model in Multiflash

Hydrate formation and phase boundary calculations

Overview of hydrate inhibitors

Hydrate inhibitor models in Multiflash

How to calculate the amount of hydrate inhibitors

Inhibition effect of salts

7.   Wax precipitation

Overview of petroleum waxes

Thermodynamic wax model in Multiflash

Waxy crude/condensate characterization

Tuning the wax model to match experimental data

Impact of wax precipitation on wax deposition

8.   Asphaltenes

Overview of asphaltenes

The Multiflash asphaltene model

Asphaltene precipitation curve and phase envelope calculations

Modelling the effect of gas injection on asphaltene stability in crudes

Effect of blending on asphaltene flow assurance

9.   Multiflash Excel Interface

Multiflash Excel functions and function arguments

Setting up an Excel application

10.   Case Studies

Solve problems, involving various topics, using the Multiflash GUI and/or Excel.

Main topics

- Fluid characterisation – analysis of PVT reports, model set up and simulations
- Wax separation
- Hydrates formation
- Asphaltnes precipitation