OGE Academy
3. Televisionniy Lane, Russia, 634003
Tel. +7 3822 660130, fax +7 3822 660307

92/5, Kurortniy avenue, Sochi, 354054, Russia
Tel./fax +7 862 2255 447
e-mail: oilteam@oilteam.ru
www.oilteam.ru

«RESERVOIR FLUID SAMPLING AND PVT ANALYSIS», 5 days

COURSE OBJECTIVE:

Improvement of professional competencies of petroleum engineers in sphere of reservoir fluid researches and modeling.

ACQUIRED ABILITIES:

- apply methods and features of reservoir fluid sampling;
- apply quality sampling criteria in practice;
- apply classification and behavior features of different reservoir fluids types;
- use knowledges of PVT analysis methodology as a part of standard scheme of reservoir fluid study, as well as properties changes features of separate fluids as results of degassing of different types;
- confidently operate with key reservoir oil and gas parameters;
- use knowledges of PVT analysis methodology applied in water injection modelling aimed to EOR;
- understand PVT analysis methodology aimed at unconstrained production;
- operate with PVT parameters;
- get reservoir fluid properties from direct parameters measure (standard separation, differential test);
- get reservoir fluid content on basis of content of standard separation fluid (mathematical recombination);
- check test data by use of material balance;
- understand features of regulatory documents application in sphere of reservoir fluids study;
- understand gas chromatography fundamentals studying reservoir fluids;
- work with Russian and foreign version of technical report on reservoir fluid PVT analysis;
- mathematic modeling of reservoir fluids;
- see a target and apply different methods of reservoir fluid modeling;
- work in PVT simulator;
- determine a reason for reservoir fluid properties change and conclude for its mathematical description;
- analyze primary data on reservoir fluid analysis, sort out faulty data.

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COURSE CONTENT:

Module Name	Content
Reservoir fluid analysis: scope and objectives	Why do we study fluids? Reservoir fluids parameters for reserves estimate and field development design. Phase state and reservoir fluid types. Reservoir and separated fluids classification.
Reservoir fluid sampling: sample types and manner	Well preparation and subsurface sampling. Field methods of well test and sampling for recombination. Design features of downhole sampler. Samples quality control.
Reservoir fluid experiment. Experiment methodology and results	Study in case of stationary mass. Standard separation. Differential de-gassing. Depletion analysis with constant volume. Differential condensation and its features.
Advanced reservoir fluid study for EOR modeling	Swelling test. Multi-contact blending. Minimum miscibility pressure: study in thin tube.
Reservoir fluid content	Chromatographic analysis of liquid and gas phases. TBP with fraction properties evaluation. Mathematic recombination of reservoir fluid content.
Degassing types	Degassing types features.
Reservoir fluids regulatory documents for reserves estimate and project design documentation	Practice.
Physicochemical oil and gas properties under standard conditions	Fluids classification. Standard oil properties. Spec oil properties.
Mathematic reservoir fluids simulation on state equation basis	Equation of state (EOS). Components and fractions properties. Characteristics of oversize. Grouping and ungrouping. Experiment simulation. State equation adjustment to experimental data. Simulation of content differentiation of reservoir fluid at depth. Data export to hydrodynamic simulator. «Black Oil» and «EOS» modeling. Practical issues of EOS adjustment.
Content and properties differentiation of reservoir fluid at depth	Case studies.
Features of operation with heavy oil. Volatile and near-critical fluids	Case studies.
Results analysis and parameters verification for reserves estimate and project design documentation	Correlation of reservoir fluid properties. Characteristic graphs for data analysis. Analysis of double phase deposits fluid analysis. Examples of parameters verification. Sample screening criteria. Estimate of data validity.