



«RESERVOIR SIMULATION: PRACTICAL ASPECTS», 5 days

COURSE OBJECTIVE:

improvement of professional competencies of petroleum engineers in sphere of reservoir modeling and its application for analysis and design of field development.

ACQUIRED ABILITIES:

- Prepare, analyze and adjust input files of reservoir model;
- Analyze and prepare input data required for reservoir modeling: structural grid, static and dynamic features of rock and fluids, initial and boundary conditions, location, parameters and operation of well;
- Gather reconversion parameters of geological model while rescaling;
- Apply geologically and physically reasonable approaches for history matching;
- Estimate quality, validity and adequacy.

COURSE CONTENT:

Module Name	Content
Introduction	Model concept. Types of models. Reservoir modeling. Structure of model. Application of models for analysis and design of field development. Development of reservoir modeling.
Structural grid and model static properties	Types of structural grids. Capabilities (local grid refinement, non-neighboring connections). Boundary conditions. Static properties of simulation grid block (reservoir volume ratio, porosity, absolute permeability). Darcy's law for one-phase flow. Flow calculation between grid blocks.
Dynamic properties of model and fluid rock properties	Dynamic properties of model blocks (pressure, saturation). Relative phase permeability. Capillary pressure. Wettability and its impact on fluid-rock properties. Darcy's law for two-phase flow. Pressure metering for calculation of flow between grid blocks. Numerical modeling error.
Physical properties	Phase envelopes. Physical properties of formation fluids and its adaptation to the pressure. Types of black oil models.
Initial conditions	Ways of pressure initial distribution and saturation setting. Saturation distribution on basis of capillary gravitational balance.
Well modeling	Well operation. Darcy's law for radial flow (Dupuis formula). Skin-factor. Pisman's radius. Flow calculation (vertical and horizontal wells).



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

History matching	Recommendation to adaptation. Model properties adjustment. Criteria and estimation of adaptation quality. Verification of field data. Methods of automatic adjustment.
Rescaling	Upscaling. Rescaling of storage capacity. Absolute permeability rescaling. Relevant phase permeability rescaling. Evaluation of rescaling quality.