

Advanced Course :: Reservoir Management

Production optimisation and increase in oil recovery factor.

The hands-on course provides the principles of how fluid moves in the reservoir and what can be done about it. Based on the data gathered during reservoir management, the continuous adjustment of the geological and fluid flow models is essential for production optimization, increasing oil recovery factor and CO₂ storage, and decreasing environmental damage risks.

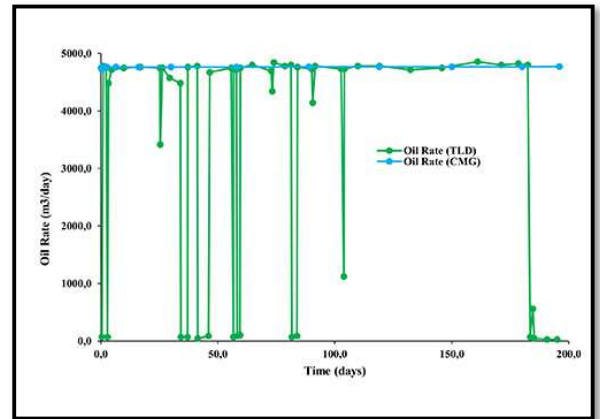
COURSE TYPE: LIVE STREAMING (05 DAYS, 20 HOURS)

GROUP 01: 12 - 16/MAY (PORTUGUESE)

GROUP 02: 25 - 29/AUG (PORTUGUESE)

TIME: 14 - 18H (BRAZILIAN TIME ZONE)

COST: € 1000 :: + IVA

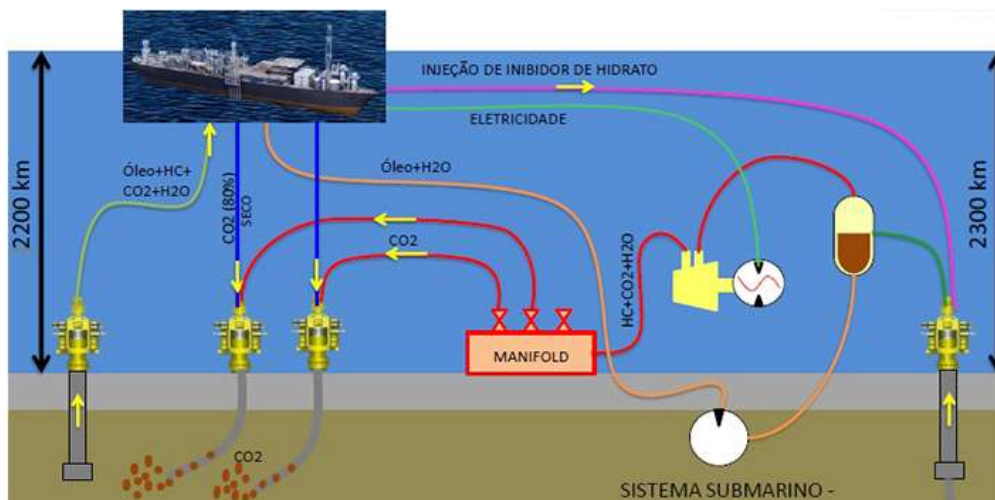


How to optimise production and increase the recovery factor by management practices?

Oil field production activities include the need to solve numerous problems, such as leaks in tubing and packer, poor cementation, leak zone, layer with water with and without crossflow, wrong perforation, water and gas cone, presence of fractures, anisotropy of the reservoir, transition zone, and so on.

The solution goes through the following steps: classification of the flow nature, if the problem is a simple flow or if the problem is multiple, which is the most serious if the problem can be solved independently or in an integrated way, what are the chances of success when control the flow problem, and if a cost-effective solution can be generated.

In any case, integration with reservoir geology always leads to a better solution



CO₂ production scheme with reinjection in another field without using an FPSO.

Objectives

Provide the basics of numerical simulation, based on the geological modelling of problems 3 and 4 proposed by Dean et al. (2006, SPE Journal 79709), to use the principles of geomechanics in oil production. Problem 3 refers to the paradox of increasing pressure under depletion in cells at the interface of blocks of different stiffness. Problem 4 is adapted to represent the variation in permeability induced by pressure changes.

Upon completion, professionals are expected to understand and optimise the fluid flow in porous media with numerical approaches and characterization with geomechanics and other relevant physics in heterogeneous geological models.

Content

Use of the compliance matrix to solve reservoir management problems with a geomechanical approach and environmental concern.

- **Day 1: Gas engineering.**
Thermodynamics applied to phase equilibrium; Development of gas fields; Recovery factor; Material balance; Production flow, condensed gas; CO₂ EOR; Technical and operational factors of CO₂ injection; CO₂ projects; Sources of CO₂; CO₂ potential; Mechanisms of the CO₂ process: Miscibility, relative permeability, injectivity and sweep; wettability; Immiscible injection; solubility in water; gravitational effect.
- **Day 2: Geomechanics applied to the development of a field.**
Effect of fractures on production and injection; Reservoir compaction; geomechanical effects in the reservoir, thermal effects, reservoir monitoring, problems in wells and reservoirs, in situ stresses, structural geology, rock properties, coupled stress-flow simulation; integrity of the capping rocks; data acquisition for geomechanics; Injection above fracture pressure.
- **Day 3: Management of reservoir production potential.**
Stratigraphic refinement; How to specify a reservoir; Darcy's Law, IP and II, production mechanisms, material balance; decline; decline: volumetric method; evaluation of training; cone or channelling; how to increase oil recovery; Innovative solutions; properties of fluids, properties of rocks, examples of complementary development.
- **Day 4: Solving production problems.**
How does fluid move, and what can you do about it? Compliance engineering; The four issues to be resolved to maximize oil recovery are conventional IOR, immiscible displacement, analysis and troubleshooting.
- **Day 5: Management of production and environmental projects.**
Special methods; chemical methods; examples of field projects; CO₂ projects; WAG fundamentals.

Who should attend

Geologists and engineers working in the exploration and production of petroleum and other natural resources, storage of C and H, and injection of contaminants.

Instructor

- Luis **Glauber** Rodrigues, PhD