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## N908: Well Testing and Pressure Transient Analysis

Instructor(s): John Lee

### Format and Duration

Classroom - 4 Days

Virtual - 8 Sessions

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### Summary

This course provides participants with the advanced skills and understanding required to interpret and analyze complex pressure transient tests in oil, gas, and water injection wells. Simple models are used to illustrate principles and to analyze real reservoirs. More complicated models are introduced as extensions of the simple models. Well testing and pressure transient testing provide valuable reservoir characterization information required for reservoir studies, well spacing considerations, and stimulation design and analysis. Test analysis provides estimates of in-situ permeability in the drainage area of wells, location of flow barriers, and stimulation effectiveness. This information and analysis will ultimately help reservoir management and field development teams to optimize the productive potential of their reservoirs and fields.

### Learning Outcomes

Participants will learn to:

1. Evaluate depth of investigation achieved during transient tests.
2. Identify wellbore storage-distorted well-test data.
3. Evaluate flow regimes during transient tests and establish the likely reservoir model to use in test interpretation.
4. Describe well and reservoir properties, including permeability, skin factor, average drainage area pressure, and distance to important heterogeneities.
5. Analyze reservoir properties in complex wells and reservoirs, including horizontal wells, hydraulically fractured wells, and naturally fractured reservoirs.
6. Recall appropriate well test objectives and design tests to achieve those objectives.

### Training Method

This is a virtual classroom course comprising a mixture of lectures, discussion, case studies, and practical exercises.

### Who Should Attend

The course is designed for mid to senior level engineers and engineering managers.

### Course Content

The course addresses identification of both simple and complex reservoir models, quantification of important reservoir properties in homogeneous-acting, bounded, and infinite-acting, naturally and hydraulically fractured reservoirs, and analysis of both vertical and horizontal wells.

Topics covered by this course:

- Basic concepts - Fluid flow through porous media

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- Type curve analysis
- Formation damage and stimulation
- Modification for gases and multiphase flow
- Diagnostic plots
- Buildup tests and the diagnostic plot
- Phase redistribution
- Bounded reservoirs
- Multiwell testing
- Estimating average reservoir pressure
- Hydraulically fractured wells
- Naturally fractured reservoirs
- Pressure transient analysis for horizontal wells
- Effects of errors in input data
- Well test design
- Integrated well test interpretation