



# N908: Well Testing and Pressure Transient Analysis

Instructor(s): John Lee

4 Days

Competence Level:  
Skilled



Classroom Course

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

## Duration and Training Method

A four-day classroom course comprising lectures with worked examples, hands-on exercises, and discussion. Approximately 25% of class time is spent on computer-based exercises.

## Who Should Attend

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

## Prerequisites and Linking Courses

Acquaintance with basic well testing and pressure transient analysis principles and terminology is assumed.

Related courses include N484 (Reservoir Management for Unconventional Plays), N986 (Reservoir and Production Engineering of Resource Plays), and N989 (Rate and Pressure Transient Analysis for Unconventional Resources).



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## 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
- 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