



Aspen HYSYS for Upstream Oil & Gas:
Well Test Data Integration & Fluid
Characterization



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Introduction:

Aspen HYSYS has become an industry-leading process simulation tool widely used in upstream oil and gas operations. This Aspen HYSYS for Upstream Oil and Gas: Well Test Data Integration and Fluid Characterization course focuses on integrating well test data into Aspen HYSYS to enhance reservoir understanding and improve the accuracy of fluid characterization.

Participants will learn how to interpret well test results and incorporate them into dynamic simulation models, facilitating better decision-making for field development. The Aspen HYSYS for Upstream Oil and Gas: Well Test Data Integration and Fluid Characterization training covers detailed methods for estimating fluid properties, analyzing phase behavior, and forecasting production using Aspen HYSYS.

This Aspen HYSYS for Upstream Oil and Gas: Well Test Data Integration and Fluid Characterization program emphasizes real-world applications to optimize production strategies and enhance reservoir performance evaluations. It bridges the gap between raw field data and actionable reservoir engineering insights. Learners will gain practical skills for fluid modeling, enabling enhanced integration of well test data with simulation workflows.

Targeted Groups:

This Aspen HYSYS for Upstream Oil and Gas: Well Test Data Integration and Fluid Characterization training targets professionals seeking specialized knowledge and skills:

- Reservoir engineers are involved in modeling fluid properties.
- Production engineers manage well test interpretations.
- Petroleum engineers work on upstream simulation projects.
- Field development planners require accurate characterization of fluids.
- Data analysts integrate oil and gas well test datasets into simulation software.
- Technical leads oversee reservoir and production performance.
- Graduate engineers aspiring to specialize in upstream simulation.
- Consultants supporting oil and gas production optimization.
- Project managers coordinate the analysis and modeling of reservoir data.

Targeted Competencies:

Participants will gain the following competencies during the Aspen HYSYS for Upstream Oil and Gas: Well Test Data Integration and Fluid Characterization program:

- Competency in analyzing and interpreting well test data relevant to fluid characterization.
- Skills in creating and calibrating fluid models within Aspen HYSYS.
- Ability to integrate complex datasets into simulation workflows confidently.
- Enhanced knowledge of phase envelope calculations and fluid phase behavior.
- Practical expertise in production forecasting using well test-informed models.
- Capacity to troubleshoot and optimize simulation models for upstream projects.
- Critical thinking to assess reservoir data for better decision-making.
- Effective communication of simulation findings to multidisciplinary teams.

Course Objectives:

Participants will achieve the following objectives by completing the Aspen HYSYS for Upstream Oil and Gas: Well Test Data Integration and Fluid Characterization course:

- Understand the fundamentals of well test data and its significance in upstream operations.
- Apply oil and gas well-test integration techniques accurately to the Aspen HYSYS models.
- Analyze and characterize fluid properties using phase behavior modeling.
- Interpret production and pressure transient test results effectively.
- Develop dynamic reservoir simulation models incorporating real test data.
- Forecast production performance based on integrated fluid and reservoir data.
- Optimize fluid modeling workflows for the upstream oil and gas project.
- Critically evaluate model results to support reservoir management decisions.
- Demonstrate proficiency in using Aspen HYSYS for fluid characterization tasks.

Course Content:

Unit 1: Introduction to Aspen HYSYS and Upstream Oil & Gas Fundamentals:

- Overview of Aspen HYSYS simulation software for upstream oil & gas.
- Importance of well test data in reservoir engineering.
- Basic concepts of fluid characterization and phase behavior.
- Introduction to well testing methods and types of tests.
- Data Requirements for Simulation and Model Setup.
- Software environment and user interface basics.
- Key terminologies and industry standards related to upstream simulation.

Unit 2: Well Test Data Acquisition and Interpretation:

- Understanding pressure transient analysis principles.
- Types of well tests: buildup, drawdown, interference, and rate tests.
- Data quality checks and preprocessing techniques.
- Extraction of reservoir parameters from test data.
- Interpretation of well test plots and diagnostic tools.
- Common pitfalls and challenges in well test data.
- Integration of well test data with reservoir simulation inputs.

Unit 3: Fluid Characterization Techniques in Aspen HYSYS:

- Fluid sampling and laboratory PVT analysis overview.
- Setting up fluid packages in Aspen HYSYS.
- Building fluid components and creating fluid libraries.
- Phase envelope generation and interpretation.
- Modeling of black oil and compositional fluids.
- Handling complex fluid behavior: condensates, retrograde gases.
- Calibration of fluid models using well test and PVT data.

Unit 4: Well Test Data Integration with Dynamic Reservoir Models:

- Linking well test results with reservoir simulation workflows.
- History Matching Techniques Using Well Test Data.
- Dynamic modeling of production scenarios in Aspen HYSYS.
- Sensitivity analysis of fluid properties on simulation outcomes.
- Simulation of Multiphase Flow and Its Impact on Reservoir Performance.
- Troubleshooting model discrepancies and data inconsistencies.
- Use of advanced simulation features for optimizing well performance.

Unit 5: Production Forecasting and Optimization:

- Utilizing fluid models for production forecast accuracy.
- Scenario analysis for well performance under variable conditions.
- Impact of fluid properties on recovery and enhanced oil recovery methods.
- Interpretation of simulation results for decision support.
- Integration with field development planning and economic evaluation.
- Reporting and presentation of fluid characterization results.
- Best practices for maintaining updated fluid models in reservoir management.

Final Insights & Key Takeaways:

This Aspen HYSYS for Upstream Oil and Gas: Well Test Data Integration and Fluid Characterization course equips participants with advanced skills to effectively use Aspen HYSYS in upstream oil and gas workflows. The integration of well test data enhances reservoir understanding and improves the precision of fluid characterization. Mastery of these techniques supports accurate production forecasting and optimized reservoir management. Learners will be prepared to apply these competencies confidently in real-world upstream projects.