

**Petroleum Professional Development Center**

*Continuing Education for Oil & Gas Professionals*

# **Introduction to Oil & Gas Reserves**

This two-and-a-half-day course covers all aspects of reserve reporting - from concepts to validation. Specifically designed for oil & gas professionals, it provides participants with the tools and knowledge they need to understand, use, and validate a reserve report. Using clear and non-technical language, the course uses modules to introduce basic reservoir concepts, reserve definitions, the preparation of a reserve report, and the wide variety of metrics and methodologies used to validate a reserve report. The course uses real-world data, field examples, and reserve software to emphasize and demonstrate key concepts. Upon conclusion, participants will have gained a better understanding of how to proactively review, analyze, and validate a reserve report; and, perhaps more importantly, how to identify the underlying risks not readily apparent in a typical reserve report

## Those Who Attend this Course Will Learn:

- The basic concepts and definitions of oil & gas reserves
- The data required to prepare a reserve report
- How a reserve report is prepared
- How to read a reserve report
- What a reserve report can and cannot tell you
- The strengths and weaknesses of any given reserve report
- Basic Reserves analysis and metrics from F&D costs to the Recycle Ratio, along with their strengths and weaknesses
- How to use basic oil & gas performance analysis to validate a reserve report
- The importance of lookbacks to reserve validation
- Putting it all together - how to quantify the risks associated with any reserve report

## Intended Audience:

This course is designed for all professionals within the oil and gas industry, including new hires, non-technical personnel, and engineers seeking a quick refresher on reserves analysis and reporting. Although non-technical in nature, it does assume a basic familiarity with common terms and metrics used in the industry.



## Course & Fee Structure:

**Course Fee** – Course fee is \$700 per student and includes all course materials. Students can register online at Course Catalogs (midland.edu)

**Scheduled Dates:** Spring 2024 – 5/21-23  
Fall 2024 – TBD

**Onsite Training** – The Course fee is \$2,025 per student plus \$250 per diem per day for travel expenses in Texas, or \$250 per day plus airfare if outside of Texas. Fees include all course materials and a copy of the book Oil & Gas Performance Analysis (list price \$105).



## Instructor:

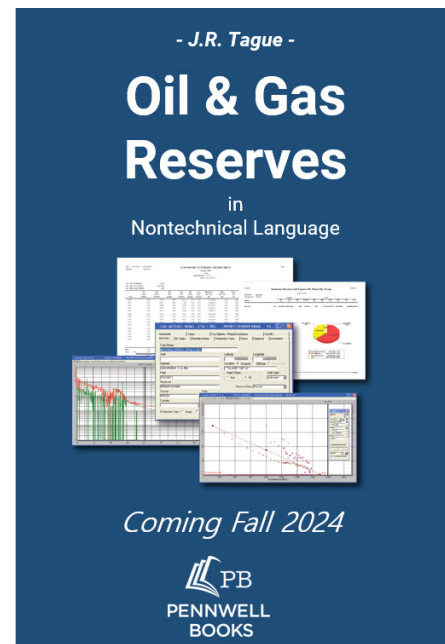
**Jim Tague** is an oil & gas consultant with extensive industry experience and the author of PennWell Publishing's "Oil & Gas Performance Analysis ." He is a Principal Consultant with the Performance Analytics Group and a former COO, CFO, and Senior Vice President of Corporate Planning and Development. With both an MBA and a Master's Degree in Petroleum Engineering, he can seamlessly present both the technical and financial aspects of many petroleum disciplines to a wide-ranging audience. As an author and experienced speaker, he is known for his ability to establish rapport with his students. In addition to his industry experience, Jim served as a carrier-based E-2C Hawkeye Naval Flight Officer in the U.S. Navy. Mr. Tague has a B.S. in Materials Science and Engineering (with Honors) from the University of Florida, a M.S. in Petroleum Engineering from the University of Texas, and an MBA from the University of Phoenix.

## Oil & Gas Reserves in Nontechnical Language

Unlock the secrets of oil and gas reserves with this essential guide! Whether you're an investor, engineer, executive management, or energy finance professional, understanding how reserves are estimated and reported is crucial for making informed decisions. Starting with the basic principles of geology and petroleum, this book demystifies the complex world of reserves, showing you how they are calculated and reported. Learn to interpret reserve reports, validate their contents, avoid costly mistakes, and gain the confidence to navigate the energy sector's challenges...

Available: November 2024

PennWell Books



## Course Schedule

### Day One

**Introduction.....8:00AM - 8:30AM**

**Module One - Oil & Gas Reserves - Concepts and Definitions.....8:30AM - Noon**

- Basic Reservoir Concepts ((non-technical)
- Definition of Reserves / Classes / Categories
- Key Definitions Used in Reserve Reporting

**Module Two - The Preparation of a Reserve Report.....1:00PM - 4:30PM**

- How Reserves are Calculated
- Data Requirements
- Software Demonstration / Inputs & Outputs
- Reconciliation

### Day Two

**Module Three - The Reserve Report.....8:00AM - Noon**

- The Various Types of Reports
- How to Read a Reserve Report
- What a Reserve Report can and can't tell you

**Module Four - Key Reserve Metrics.....1:00PM - 4:30PM**

- The Most Important Metrics
- How to Calculate and Use the Metrics
- The Strengths and Weaknesses of Various Metrics

### Day Three

**Module Five - Reserves Validation .....8:00AM - 11:00AM**

- Lookbacks - the Most Valuable Validation Method
- Using Performance Analysis to Validate a Reserve Report
- The Real World - How to Identify Risks in a Reserve Report

**Wrap Up & Conclusion.....11:00AM - Noon**

## Module One - Oil & Gas Reserves: Concepts & Definitions

**Fundamentals** - In the oil and gas industry, reservoirs are petroleum accumulations within porous and permeable rocks. This section introduces the basic terms and concepts of reservoir formation and occurrence, how hydrocarbon reservoirs are found and characterized, and how oil and gas can be commercially recovered from these reservoirs.

**Definitions Used in Reserve Reporting** - By definition, reserves are considered hydrocarbons that can be commercially recovered from known accumulations of hydrocarbons. However, there are multiple classes and categories of reserves. This section introduces the key concepts and definitions of petroleum reserves with a particular focus on those used in actual reserve reporting.

**How Reserve Reports are Used** - The Reserve Report is the most fundamental of all reports prepared and used by the oil & gas industry. Management uses the report to prepare budgets and forecasts. Finance Professionals use it to calculate valuations and loan amounts. Accountants use the report for taxes and depletion allowances. The SEC uses it for auditing purposes. Indeed the uses are wide and varied. This section introduces who uses the reserve report and for what purposes.

## Module Two - The Preparation of a Reserve Report

**Oil and Gas Data Sources** - How Reserves are Calculated - The preparation of a reserve report is a very intense undertaking. Larger companies have entire staffs of reservoir engineers dedicated to this task. Fortunately, the SEC provides a general set of guidelines for companies to use when preparing a reserve report. Additional guidelines are provided by the Society of Petroleum Engineers. This section looks at the basics of what is required to prepare a Reserve Report and how Reserve Engineers begin the process of creating one.

**Data Requirements** - Significant data is required to prepare a reserve report, such as historical production data, projected production from capital expenditures, operating expenses based on the previous month's LOS report, state, and local tax rates, and all future expenses necessary to drill new wells or implement enhanced oil recovery techniques. Other data requirements include price differentials, gas quality inputs, abandonment costs, and, of course, the working interest and net royalty interest. This section covers what data is required and how it is used to calculate actual reserves.

**Software Demonstration / Inputs & Outputs** - All of the necessary data is usually entered into a software program, with ARIES and PHDWin being the most commonly used. Once the data is entered, the reserve engineer typically goes through each well in the database and builds or adjusts the decline curve based on the latest reported production. In addition, new wells and projects can be entered into the database. This section demonstrates how this software is used to create a Reserve Report.

**Reconciliation** - Once a Reserve Report is prepared, the output must be reconciled with actual company performance. This practice ensures operating expenses and capital costs are within norms. Reconciliation is an important factor in reserve confirmation, and this section demonstrates how reconciliation is accomplished.

## Module Three - The Reserve Report

**Types of Reports** - Today's software makes it easy to generate reports by just about any reporting entity - from a single well to an entire corporate-wide roll-up. Generated reports can also be very simple or quite detailed; it is simply up to the report generator to select the report and output parameters desired.

**How to Read a Reserve Report** - Although a wide variety of reserve reports, each contains basic data and information that can be used to make investment and financial decisions. This section covers the various reserve reports such as one-liners, standard economics, well rankings, and others, and teaches participants how to read these reports and extract desired information.

**What a Reserve Report Can and Cannot Tell You** - The data and information in a reserve report are extremely valuable for various reasons. Yet, despite its usefulness, it does have limitations. First, one must never forget that reserves are still estimates and must be risked accordingly. In addition, reserves do not contain information on a wide variety of other factors that can influence how a company can monetize those reserves. Corporate G&A, debt levels, cash flow constraints, and other financial factors are not evaluated in a reserve report. Management's strengths, weaknesses, and ability to deliver are irrelevant to a reserve report. However, these factors can heavily influence whether the forecasts and values found within a reserve report can be realized. This section covers all of these factors and more in order to demonstrate what information a reserve report can provide and how many other non-reserve factors can influence the report for better or worse.

## Module Four - Key Reserve Metrics

**The Most Important Metrics** - There are literally dozens of metrics used to analyze reserves. Some are quite technical and exist within the realm of Reservoir Engineering. However, many are less technical and can be easily calculated using standard Reserve Reports and company financials. This section introduces a number of key metrics such as F&D Costs, the Recycle Ratio, Reserve Replacement Ratios, and others - which are quite valuable in determining the strength and ability of a company to grow and profitably monetize reported reserves.

**How to Calculate and Use Reserve Metrics** - This section demonstrates how to find the necessary data and then calculate key reserve-related metrics. This is followed by a brief introduction to analytical methods such as benchmarking, trend analysis, and stacking, allowing users to quantitatively and qualitatively analyze reserves for various strengths and weaknesses. Actual reserve reports and other examples will be used to calculate and demonstrate how these important reserve metrics are used in energy finance.

**The Strengths and Weaknesses of Various Metrics** - While extremely important, every metric has its own associated strengths and weaknesses when it comes to interpreting just what the metric tells you. This section briefly discusses these strengths and weaknesses in order to ensure appropriate decision making and to avoid any overreliance on any one particular metric.

## Module Five - Reserves Validation

**Lookback Analysis** - Lookbacks represent an exceptionally powerful tool for anyone seeking to validate a reserve report. Unfortunately, lookbacks are often considered to be time-consuming and arduous. Fortunately, there are simple techniques that can be used to screen and compare past results and projections to current performance. Reserve software facilitates this process, and comparing past reserve-based metrics to forecast metrics can easily determine the validity of a current reserve report. This section covers these lookback techniques and more in order to teach students how to quickly compare past reserve report projections to current projections in order to determine their overall validity and whether a reserve report is overly cautious or aggressive compared to historical performance.

**Performance Analysis** - This section will compare reserve forecasts with actual results using company financials, proformas, and budget forecasts to validate current projections and valuations. The impact of price movements, hedges, corporate overhead, debt, exploration efforts, free cash flow, and acquisitions will all be discussed in relation to how they can impact the forecasts and projections found within a reserve report.

**The Real World** - The class will conclude with several examples from actual oil and gas companies that have failed despite having strong reserve reports. The reasons for these failures will be examined, and students will be taught to look for the various early warning flags that preceded failure despite the posting of third party audited reserve reports.

## Wrap-Up and Conclusion / Q&A

The course will wrap up by answering questions and discussing current events related to reserves, oil and gas prices, and any other issues or topics impacting current reserve reports. If desired, time can be allocated to cover and discuss actual examples relevant to participants. The instructor is willing to sign a Confidentiality Agreement to facilitate this exercise.



## PETROLEUM PROFESSIONAL DEVELOPMENT CENTER PPDC

# Oil & Gas Training

The Petroleum Professional Development Center (PPDC) of Midland College provides quality continuing education for the Permian Basin energy industries. The center is one of seven mid-career training centers worldwide recognized by the American Association of Petroleum Geologists (AAPG).

The mission of the PPDC is to provide quality continuing education designed to keep oil and gas industry professionals current in their areas of expertise through dynamic interaction between the community, the college, and the industry. The PPDC will provide high quality, timely, and pertinent educational opportunities to meet the professional development needs of those working in the regional energy industry.

Many of our classes qualify for re-certification credits that Professional Engineers, Professional Geologists and Petroleum Landmen use to maintain their professional certification status.

The PPDC also holds various symposiums on timely issues important to the region's oil and gas industry.



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