
Oil and Gas Reserves Estimating -- We Have Met the Enemy, and He is Us

Peter R. Rose, Rose & Associates, LLP, 3405 Glenview Avenue, Austin, TX 78703, phone: 512 451 8778, prrose@roseassoc.com

Whether predictions are expressed *deterministically* or *probabilistically*, they are still estimates, subject to vagaries of nature, human error, and various biases. But probabilistic estimating has 5 important advantages:

1. Forecasting accuracy can be measured;
2. Use of statistics improves estimates;
3. Reality checks can pre-detect errors;
4. It is more efficient; results being directly input into portfolios; and
5. It promotes better communication of uncertainty.

Faithful to decades of engineering practice, reinforced by U.S. SEC-approved standards, "Proved Reserves" is a deterministic number that refers to a specified volume (or more) of hydrocarbons that the estimator is "reasonably certain" will be recovered. However, this is actually a probability statement, *except that no confidence-level (= probability) is specified*. Accordingly, proved-reserves estimators cannot be accountable. Reserves estimates are also susceptible to bias because larger estimates may benefit the value of estimators' own shares, annual bonuses, repeat business, or organizational status. On the other hand, various negative career and legal consequences may ensue if the "reasonably certain" estimate turns out to be too optimistic. This constitutes a self-made, illogical, and insupportable professional conundrum.

Today, Petroleum E&P is a divided industry: modern Exploration has adopted probabilistic methods for estimating recoverable volumes of oil and natural gas from prospects, given discovery. But the Production side of E&P generally remains stuck in the old rut of inferior deterministic methodology.

A simple remedy would facilitate the transition to probabilistic methods for the entire E&P Industry: for members of all professional geotechnical and engineering societies to specify that when they use the term "proved", they are explicitly affirming 90% confidence in their estimates, regardless of outmoded and illogical SEC definitions.
