Reservoir Engineering II

Reserve Estimation

By

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Introduction

- To the oil and gas industry, reserves are the amount of crude oil, natural gas, and associated substances that can be produced profitably in the future from subsurface reservoirs.

- it has been recognized that there is always some degree of uncertainty in estimating reserves

Introduction

Estimates of oil and/or gas reserves are inherently uncertain. The degree of uncertainty in estimates of reserves depends mainly on:

- The degree of geologic complexity.
- How old are the acquired data.
- The quality and quantity of geologic and engineering data.
- The operating environment.
- The skill, experience and integrity of the estimators.

Reserves classifications

1. Proved reserves (with certainty of 90%).

2. unproved reserves: this type of reserves divided into two categories:

a) probable reserves (with certainty of 50%)
b) possible reserves (with certainty at least of 10%) based on the engineer's judgment and relevant

guidelines regarding the probability of actually producing such reserves.

Reserve Status Categories

Reserve status categories define the development and producing status of wells and reservoirs.

Developed Reserves: Developed reserves are expected to be recovered from existing wells including reserves behind pipe.

Undeveloped Reserves: Undeveloped reserves are expected to be recovered: (1) from new wells on undrilled acreage, (2) from deepening existing wells to a different reservoir, or (3) where a relatively large expenditure is required to install production or transportation facilities for

Reserve Status Categories

Developed reserves may be subcategorized as producing or non-producing.

Producing Reserves: are expected to be recovered from completion intervals which are open and producing at the time of the estimate.

Non-producing: Reserves subcategorized as non-producing include:

1. Shut-in reserves: are expected to be recovered from completion intervals which are open at the time of the estimate but which have not started producing

2. behind-pipe reserves: Behind-pipe reserves are expected to be recovered from zones in existing wells, which will require additional completion work

Reserve Estimation Methods

Reserve estimation methods may be classified as:

- **Analogical Methods.**
- **Volumetric Methods.**
- **Performance Methods.**
  - Material Balance.
  - Computer Simulation.
  - Performance/Decline Trend Analysis.