PEA
PETROLEUM ENGINEERS ASSOCIATION

5 Days Online Training Program on
Fundamentals of Petroleum Economics & Decision Making Under Uncertainty

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INTRODUCTION

This course is designed for learning the basics of petroleum economics and project evaluation. Several key concepts that will be discussed are the time value of money, cash flow basics, common economic indicators, fiscal systems and project evaluation fundamentals. An introduction to basic risk analysis will also be presented.

COURSE DESCRIPTION

This is an introductory training program on Petroleum Economics. No prior knowledge of the subject is assumed. By joining the course, participants will learn why project economics are vital in upstream oil and gas projects.

They will also learn about the project lifecycle. During the course, common types of oil and gas upstream projects will be presented. A number of numerical problems using Microsoft Excel will be used in the class to illustrate the various principles.

OBJECTIVE OF THE COURSE

The objective of the course is to introduce the participants to the basics of petroleum economics and project evaluation.

TRAINING METHODOLOGY

The training sessions will comprise traditional presentations, real life case study examples and solving simple numerical problems in Microsoft Excel to understand the fundamental concepts.

PERSONAL BENEFITS

Joining this basic course in Petroleum Economics will broaden your knowledge of economic concepts like NPV, IRR, and fiscal systems, making yourself more equipped to handle project evaluations and negotiations.

It will enhance your decision-making skills by teaching how to evaluate investments and manage risks in the oil and gas industry

ORGANIZATIONAL BENEFITS

Any upstream oil and gas company will benefit from training its personnel in Petroleum Economics by improving their ability to make informed investment decisions, leading to better project profitability and risk management.

WHO SHOULD ATTEND

This course is ideal for professionals involved in the oil and gas industry, including engineers, geologists, and project managers who need to understand the economic aspects of their projects. It is also beneficial for financial analysts, business development personnel, and decision-makers responsible for investment evaluations and cost management.

MODULE WISE DETAILED OUTLINE

MODULE 1:

Petroleum Industry Value Chain and Upstream Projects

VALUE CHAIN:

This section would cover the entire lifecycle of oil and gas, from exploration and production (upstream) to refining, transportation, and marketing (downstream). It would emphasize the interconnectedness of each stage and how value is added at each step.

UPSTREAM PROJECTS:

This would delve into the specifics of exploration and production activities, including:

EXPLORATION:

Geological and geophysical surveys, seismic data acquisition and interpretation, exploratory drilling.

DEVELOPMENT:

Appraisal drilling, reservoir engineering, feasibility studies, field development planning, facilities design and construction (e.g., wellheads, pipelines, processing facilities).

PRODUCTION:

Well operations, production optimization, enhanced oil recovery techniques.

PROJECT LIFE CYCLE:

Understanding the phases of an upstream project (from initial exploration to abandonment) and the associated risks and uncertainties.

MODULE 2:

Financial Analysis in Upstream Oil and Gas

CASH FLOW ANALYSIS:

Constructing cash flow models for oil and gas projects, including revenue projections, capital expenditures (CAPEX), and operating expenses (OPEX).

CAPEX AND OPEX:

Detailed examination of the different types of capital and operating costs involved in upstream projects.

CAPEX:

Exploration costs, drilling costs, facility construction costs.

OPEX:

Production costs, maintenance costs, transportation costs, labor costs.

DEPRECIATION:

Different depreciation methods (straight-line, declining balance, units of production) and their impact on project economics.

ROYALTY AND TAXES:

Understanding the fiscal terms associated with oil and gas production, including royalty payments, production taxes, income taxes, and their effects on project profitability.

MODULE 3:

Time Value of Money and Economic Evaluation

TIME VALUE OF MONEY:

The fundamental concept that money available today is worth more than the same amount in the future due to its potential earning capacity.

DISCOUNTED CASH FLOW (DCF) ANALYSIS:

Techniques to evaluate the profitability of projects by discounting future cash flows back to their present value.

ECONOMIC INDICATORS:

Calculating and interpreting key economic indicators used in oil and gas project evaluation:

NET PRESENT VALUE (NPV):

The present value of a project's cash inflows minus the present value of its cash outflows.

INTERNAL RATE OF RETURN (IRR):

The discount rate that makes the NPV of a project equal to zero.

VALUE INVESTMENT RATIO (VIR):

A profitability indicator that measures the ratio of the present value of future cash flows to the initial investment.

PAYBACK PERIOD:

The length of time required to recover the initial investment.

BREAK-EVEN PRICE:

The oil or gas price at which a project becomes economically viable.

PROFITABILITY INDEX:

A measure of the value created per unit of investment.

MODULE 4:

Fiscal Regimes in the Petroleum Industry

TYPES OF FISCAL REGIMES:

Overview of the different ways governments capture revenue from oil and gas production, including:

SERVICE CONTRACT

PRODUCTION SHARING CONTRACTS (PSCS):

The government retains ownership of the resources, and the company receives a share of the production after recovering its costs.

TAX AND ROYALTY SYSTEMS:

A combination of taxes and royalties are levied on production.

CASH FLOW MODELING:

Constructing cash flow models under different fiscal regimes to assess their impact on project economics.

GOVERNMENT TAKE:

Analyzing the government's share of revenue under different fiscal terms.

MODULE 5:

Decision Making and Risk Assessment

UNCERTAINTY IN OIL AND GAS PROJECTS:

Recognizing the inherent uncertainties in oil and gas projects, including reservoir size, production rates, oil and gas prices, costs, and fiscal terms.

EXPECTED MONETARY VALUE (EMV):

A statistical technique for making decisions under uncertainty by calculating the weighted average of possible outcomes.

DECISION TREE ANALYSIS:

A graphical tool used to evaluate investment decisions with multiple possible outcomes and uncertain events.

SENSITIVITY ANALYSIS:

Assessing how changes in key input variables (e.g., oil price, production rate) affect project economics.

SCENARIO ANALYSIS:

Evaluating project performance under different scenarios (e.g., low oil price, high oil price).

MONTE CARLO SIMULATION:

A probabilistic technique that uses random sampling to model uncertainty and estimate the probability distribution of project outcomes.

ABOUT THE TRAINER

Biswajit Choudhury is a Reservoir Engineer with about 40 years of experience in oil and gas industry. During his long career he has worked for Oil India Limited, BG Group, Shell International and Petroleum Development Oman. He was the technical authority in Reservoir Engineering function in Shell International and Petroleum Development Oman. Biswajit has presented several technical papers in international conferences and has 12 publications in international journals.

Currently as a Freelance Reservoir Engineering Consultant, he is associated with IMC Limited and Petroleum Engineers Association (PEA). He delivers several technical courses both online and in face-to-face mode and is a guest faculty at IIT (ISM) Dhanbad and IIT (Madras). Biswajit has BS and MS degree in Petroleum Engineering from IIT (ISM) Dhanbad.