

An LDI Training Course

RISK MANAGEMENT FOR OIL & GAS UPSTREAM BUSINESS

by

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BACKGROUND

The upstream oil and gas industry is one of the business sectors with the highest levels of uncertainty and risk. Exploration and production activities face numerous technical, geological, financial, regulatory, and global commodity price challenges. The capital-intensive nature of the business, its long project cycles, and its dependence on factors beyond full control make risk management a critical element in strategic decision-making.

In the Indonesian context, risk management complexity has increased with the implementation of two main production sharing contract schemes: **PSC Cost Recovery** and **PSC Gross Split**. These two models differ fundamentally in how risk is allocated between the government and contractors. Under the Cost Recovery scheme, part of the cost risk can be recovered through reimbursement mechanisms, while under the Gross Split scheme, cost risk and operational efficiency risks are largely borne by the contractor. These differences in fiscal structure directly affect project risk profiles, investment feasibility, and cost and production management strategies.

Beyond contract design risks, upstream projects are also highly exposed to project and capital investment risks. Reserve uncertainty, drilling failure, cost overruns, schedule delays, and supply chain disruptions can significantly alter a project's economic projections. In many cases, small changes in technical or cost parameters can lead to major shifts in project net present value (NPV), internal rate of return (IRR), and break-even price levels.

Economic risk is also influenced by external factors such as oil and gas price volatility, changes in fiscal policy, Domestic Market Obligation (DMO), exchange rates, and global financing conditions. Instability in these factors can disrupt project cash flows and reduce investment attractiveness, especially for marginal fields or high-cost projects.

Given the magnitude of these risk exposures, professionals in the upstream oil and gas industry are required not only to understand the sources of risk but also to systematically identify, assess, and manage them. An integrated approach combining technical, commercial, and financial perspectives is necessary to ensure that investment and operational decisions are made in a more measured and prudent manner. Therefore, comprehensive risk management training is highly relevant to strengthen the capacity of stakeholders in facing the increasingly complex dynamics of the upstream oil and gas business.

TRAINING INTRODUCTION

The **Risk Management for Upstream Oil & Gas Business** training is designed to provide a comprehensive understanding of the various risks inherent in upstream oil and gas activities and their impacts on contract structures, investment projects, and economic feasibility.

The training begins with fundamental discussions on the characteristics of risk in the upstream industry and how risks are distributed across the project lifecycle, from exploration to production. Participants will understand how contract structures, particularly under the **PSC Cost Recovery** and **PSC Gross Split**, influence risk allocation between the government and contractors, and the implications for investment and operational strategies.

The training then explores project and capital investment risks, including technical uncertainties, cost escalation, and schedule delays. Participants will be introduced to practical risk analysis tools such as sensitivity analysis, scenario analysis, and decision trees to evaluate the impact of uncertainty on drilling and field development decisions.

In the final part, the training focuses on economic risk and financial exposure arising from oil and gas price volatility, fiscal policy changes, exchange rate risk, and project financing challenges. Participants will learn how these risks affect project economic indicators and how to conduct integrated risk assessments through the preparation of risk registers and risk heat maps.

By combining conceptual explanations, interactive discussions, and numerical case studies, this training is expected to enhance participants' ability to understand upstream project risk profiles and apply risk management principles more effectively in business decision-making.

TRAINING OBJECTIVES (LEARNING OBJECTIVES)

After completing this training, participants are expected to be able to:

1. Understand the characteristics of risks inherent in upstream oil and gas operations across all stages of the project lifecycle, from exploration to production.

2. Explain the differences in risk allocation structures between PSC Cost Recovery and PSC Gross Split schemes and their implications for contractor and government risk profiles.
3. Identify project and capital investment risks, including technical, cost, schedule, and reserve uncertainties.
4. Analyze the impact of cost and production uncertainties on project economic indicators such as NPV, IRR, and break-even price.
5. Understand external risks affecting project feasibility, including oil and gas price volatility, fiscal policy changes, exchange rate risk, and financing risk.
6. Apply practical risk analysis tools such as sensitivity analysis, scenario analysis, and decision tree analysis to support investment decision-making.
7. Develop a risk register, assess risk levels, and design structured mitigation measures.

EXPECTED COMPETENCIES

Upon completion of the training, participants are expected to gain the following competencies:

1 Conceptual Competency

Participants understand the fundamental concepts of risk management in the upstream oil and gas industry, including the relationship between technical, commercial, fiscal, and financial risks in determining project success.

2 Analytical Competency

Participants are able to evaluate the impact of changes in key project parameters (cost, production, price) on economic feasibility using structured analytical approaches.

3 Practical Competency

Participants are able to:

- Identify major upstream project risks
- Develop a risk register
- Assess risk probability and impact levels
- Propose realistic mitigation strategies

4 Decision-Making Competency

Participants are able to integrate various risk types into project evaluation processes and support more prudent, risk-based investment decision-making.

RECOMMENDED PARTICIPANT PROFILE

This training is designed for professionals involved in management, evaluation, and decision-making in the upstream oil and gas sector, including:

- Project economics staff and managers
- Field planning and development teams
- PSC finance and commercial staff
- Risk management and corporate planning teams
- Personnel from regional government-owned enterprises (BUMD) holding PI
- Government officials or staff involved in upstream project oversight and evaluation

This training is suitable for participants with technical, economic, financial, or management backgrounds who wish to strengthen their understanding of risk and its impact on upstream oil and gas business decisions.

DAY 1 — FUNDAMENTAL RISK & PSC RISK STRUCTURE

Time	Session	Topic
08:00 – 08:30	Opening & Pre-Test	Training objectives, participant expectations, overview of risk management
08:30 – 09:30	Session 1	Characteristics of Upstream Business Risk • High risk – high uncertainty • Exploration vs Development vs Production risk
09:30 – 10:00	Session 2	Risk vs Uncertainty & Risk Categories • Technical vs Commercial vs Fiscal risk
10:00 – 10:15	Coffee Break	
10:15 – 11:30	Session 3	Risk Mapping Across the Upstream Lifecycle • Project risk exposure timeline
11:30 – 12:00	Discussion	Group discussion: Major risks in exploration projects
12:00 – 13:00	Lunch Break	
13:00 – 14:15	Session 4	Risk Allocation in PSC Models • PSC Cost Recovery • PSC Gross Split
14:15 – 15:00	Session 5	Government Take vs Contractor Risk Exposure
15:00 – 15:15	Coffee Break	
15:15 – 16:00	Workshop 1	Preparing a Risk Register for an exploration project

DAY 2 — PROJECT & CAPITAL INVESTMENT RISK

Time	Session	Topic
08:00 – 08:15	Day 1 Review	Summary and discussion
08:15 – 09:30	Session 1	Project Risk in Upstream Development • Reservoir uncertainty • Drilling & facilities risk
09:30 – 10:00	Session 2	Schedule Risk & Delay Impact
10:00 – 10:15	Coffee Break	
10:15 – 11:15	Session 3	Capital Investment Risk (CAPEX) • Cost escalation • Supply chain & technology risk
11:15 – 12:00	Session 4	Impact of Cost Overrun under PSC CR vs PSC GS
12:00 – 13:00	Lunch Break	

Time	Session	Topic
13:00 – 14:00	Session 5	Practical Risk Analysis Tools • Sensitivity analysis • Scenario analysis
14:00 – 15:00	Session 6	Decision Tree Analysis for Drilling Decisions • Dry hole vs discovery case
15:00 – 15:15	Coffee Break	
15:15 – 16:00	Workshop 2	Case study: Impact of +20% CAPEX on project NPV

DAY 3 — ECONOMIC RISK & FINANCIAL EXPOSURE

Time	Session	Topic
08:00 – 08:15	Day 2 Review	Key learning discussion
08:15 – 09:15	Session 1	Oil & Gas Price Risk • Price volatility • Impact on PSC GS vs PSC CR
09:15 – 10:00	Session 2	Fiscal & Regulatory Risk (taxes, PSC terms, DMO)
10:00 – 10:15	Coffee Break	
10:15 – 11:15	Session 3	Financial & Macro Risk • Exchange rate • Interest rate
11:15 – 12:00	Session 4	Financing Risk & Bankability Issues
12:00 – 13:00	Lunch Break	
13:00 – 14:00	Session 5	Economic Risk Metrics • NPV sensitivity • IRR volatility • Break-even price risk
14:00 – 15:00	Workshop 3	Integrated Risk Assessment & Risk Heat Map
15:00 – 15:15	Coffee Break	
15:15 – 16:00	Closing & Post-Test	Summary, evaluation, final discussion

LEARNING METHODS

- ✓ Interactive lectures
 - ✓ Group discussions
 - ✓ Numerical PSC case studies
 - ✓ Risk assessment workshops
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Your Course Leader



Dr. A. Rinto Pudyantoro is an expert in the upstream oil and gas sector with over 31 years of professional experience. His career includes key roles at Vico Indonesia (10 years), BP Indonesia (4 years), and strategic positions at BP Migas and SKK Migas, where he served as Senior Manager for Revenue Accounting, Taxation, and Head of Papua-Maluku operations. Before retiring, he led the Program and Communications Division of SKK Migas.

He is the author of several books on oil and gas economics and policy, including *A to Z Bisnis

Hulu Migas* (2012), *Proyek Hulu Migas: Analisis dan Evaluasi PetroEkonomi* (2014), *Dialog Tanya Jawab Migas* (2015), *Bisnis Hulu Migas* (2019), and *Kebijakan Perpajakan: Optimalisasi Insentif & Keseimbangan Fiskal* (2019, with the Fiscal Policy Agency), among others.

Dr. Rinto holds a bachelor's degree in Accounting from Gadjah Mada University (UGM), a master's in International Finance from IBII Jakarta, and a Ph.D. in Resource Economics from IPB University. He currently serves as a senior lecturer and Chairman of the Center for Business and Economics of Petroleum and Energy Studies (C-BEPES) at Pertamina University. Since 2005, he has actively led training programs in resource economics, petroleum economics, fiscal and regional economics, PSC accounting, project economics, budgeting, and international petroleum accounting.

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