

The Role of Reserves Tracking and Certification For National Oil Companies, Large Integrated Companies and Independents

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Outline

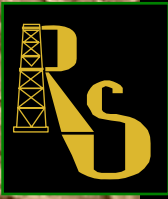
1. Introduction to hydrocarbon reserves tracking and certification
2. Reserves tracking and certification examples
3. Current reporting structures and corporate governance trends



Introduction To Hydrocarbon Reserves Tracking and Certification

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Introduction



DRIVERS

- ✓ Globalization
- ✓ NOC & IOC
- ✓ Technology
- ✓ Accounting Standards

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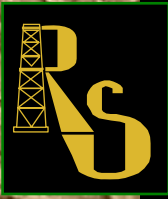
Reserves Guidelines / Definitions

- Reserves definitions provide the framework to qualify risk and uncertainty through reserves categorization
- Technology not specifically addressed
- Financial and strategic consequences



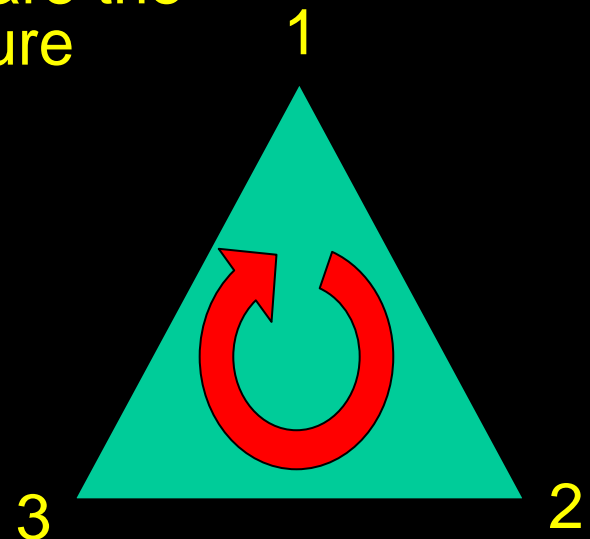
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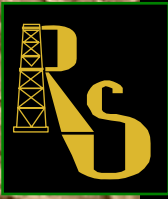
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Reserves Tracking Triangle (RTT)

1. Reserves are physical quantities - Technical
2. Reserves Reporting Guidelines are the rules for reporting those quantities
3. Reserves Reporting Systems are the procedures and tools that ensure compliance





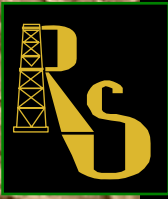
RTT 1: Reserves

- In place and recoverable hydrocarbon volumes
- Indications of risk & uncertainty
 - Upside
 - Downside
- Deliverability & Production potential
- Value and cost of future production



RTT2: Reserves Reporting Guidelines

- Provide a standardized measure of the physical assets.
- Establish uncertainty tolerance levels for reserves categorizations.
- Facilitate and prioritize business decisions.
- Establish links between internal and external reporting requirements.



RTT3: Reserves Reporting Systems

- Establish the procedures to comply with the guidelines.
 - Timing & frequency
 - Priorities & materiality
 - Technology and technology application
- Establish documentation procedures
 - Same aggregation level as the reserves evaluations

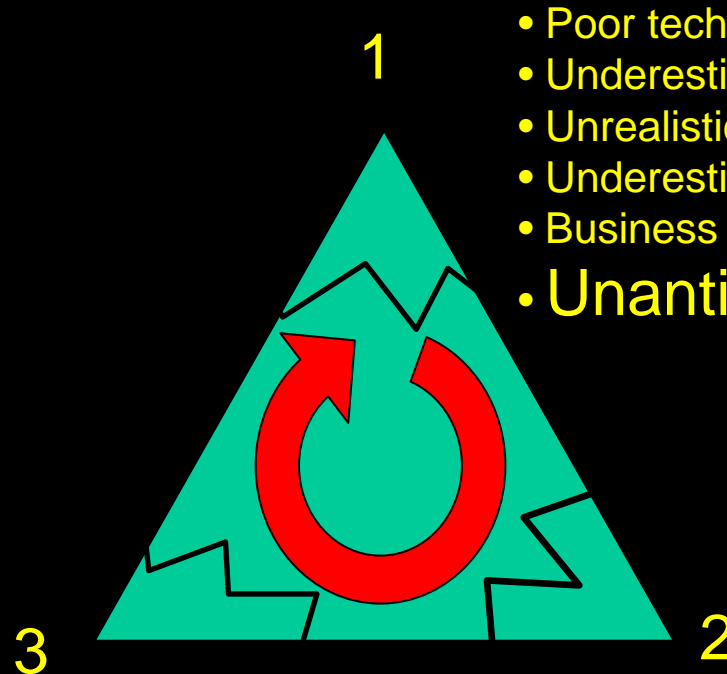


RTT3: Reserves Reporting Systems

- Provide the tools to evaluate and track reserves.
 - Software
 - Management systems
- Establish the lines for reserves reporting responsibility & accountability.
 - Personnel qualifications & training



Reserves Tracking Triangle (RTT)

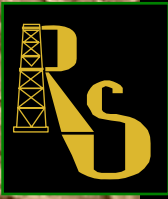


- Poor technical evaluations
- Underestimation of risk & uncertainty
- Unrealistic expectations
- Underestimation of development needs
- Business pressures
- Unanticipated results

- Business drivers & pressures
- Compromised independence
- Poor internal control mechanisms
- Failure to follow procedures

- Poorly defined / understood guidelines
- Inadequate reserves evaluation training
- Business drivers & pressures
- Internal vs. external reporting conflicts

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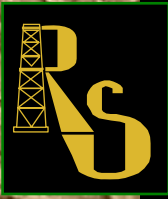
Reserve Reporting Audiences

- Commerciality means different things to different audiences
 - Societal reserves maximization / short term profitability
 - Volumes / return on investment
- Internal company reports
 - Understand and rank portfolio opportunities
 - Identify upside and downside
 - Allocate capital and manpower resources



Reserve Reporting Audiences

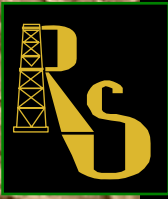
- Lending Institutions
 - No particular benefit from large upside
 - More exposure to downside
- Shareholders
 - Consistent year-to-year reports
 - Compare industry reports



Reserves Tracking and Certification Examples

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México

- Formalized Process
 - Independent reserves management group
 - Internal audits twice a year
 - External certification once a year
- Reserves guidelines
 - SEC for proved reserves
 - SPE/WPC/AAPG for probable & possible reserves
- Internal Audit
 - Reserves replacements & growth / planning
 - Link to Secretary of Energy (Central Government) & macro economic strategies
 - Meet presidential targets
 - Kyoto accord compliance – monitor gas reserves growth
- External Certification
 - Add transparency to the reserves figures
 - Gain access to international money markets





Trinidad & Tobago

- Formalized process for gas reserves
 - Yearly independent external certification
- Oil reserves process is not formalized
- Organization
 - Part of the MOE&EI Planning Group
 - MOE&EI reorganizing to form separate independent Reserves Management Unit
- SPE/WPC/AAPG reserves guidelines for proved, probable and possible reserves
- External gas certification
 - Gas master plan - allocation of gas production to domestic or LNG markets
 - Obtain standardized measure of reserves across operators for gas market share allocation, project approvals & timing

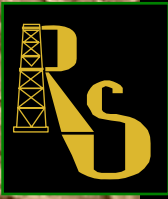




Major Middle East NOCs

- Formalized to semi formalized reserves process
 - Responsibility within E&P management line
 - Emphasis on “technical” or “expectation” reserves
 - Yearly reporting exercise
- SPE/WPC/AAPG reserves guidelines for proved, probable and possible reserves
- Internal reserves audit
 - Long term planning and OPEC quotas
 - Balance demand, production & capacity
 - Track movement of reserves categories





Medium Size Middle East NOC

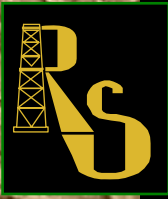
- Reserves process
 - Not considered critical for business purposes
 - Primary driver is the societal impact of the industry
 - Seeks long term production stability
- Reserves guidelines
 - Reserves reported as aggregated volumes without categorization
 - Reserves specificity tied to project approval
- External reserves audits
 - As needed to get access to international money markets.





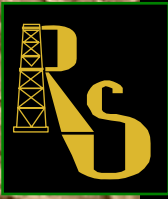
IOC Reporting Structures

- Corporate Governance
 - Recent changes due to Sarbanes-Oxley (SOX) or similar legislation
 - SOX requires the CEO and CFO to certify that financial reports:
 - Do not contain untrue statements or material omissions;
 - Fairly represent the financial conditions and results of operations



IOC Reporting Structures (Cont.)

- Reporting Organization
 - E&P line (Traditional)
 - Finance
- Direct Report
 - Board Audit Committee
 - CEO / CFO / COO



Current Reporting Structures and Corporate Governance Trends

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Changing Reserves Booking Landscape

- External
 - Increased scrutiny by regulatory agencies
 - Financial auditors are demanding increased transparency in the reserves statements
 - Increased accountability to board of directors for the content of all disclosures
- Internal
 - Increased complexity of fields
 - Acceleration of technology
 - Accountability

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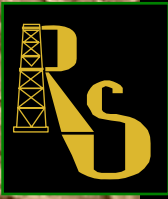
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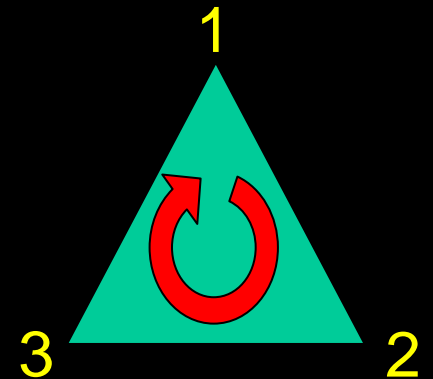
Current Reporting Trends

- Re-structuring the reporting of the lead reserve manager from an E&P line organization to the financial organization (CFO)
- The corporate reserve manager is not associated with reserve goals or targets
- Training and deployment of audit teams
 - Standardized measure across corporation
 - Final word on critical bookings and interpretative decisions



Closing Remarks

- Reserves definitions provide the framework to qualify risk and uncertainty through categorization
 - Provide a standardized measure of the physical asset
- Technology not specifically addressed
- Financial and strategic consequences
- Require robust reserves reporting systems
 - Procedures
 - Tools
 - Training





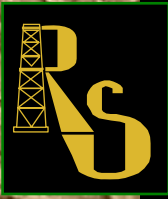
Questions?

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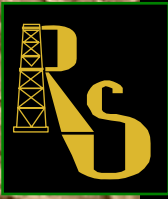
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Backup Slides

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Evolution of Hydrocarbon Reserves Definitions

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HISTORY OF RESERVES DEFINITIONS -1

1936



API created early oil reserves definitions and began use of the term “proved reserves”.

1946

AGA created definitions for natural gas and joined API in annual reserves reports for U.S.

1946 - 1979

API-AGA published annual reports of proved reserves of oil , gas and ngl for U.S.

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HISTORY OF RESERVES DEFINITIONS -2

1964



Society of Petroleum Engineers (SPE) adopted proved reserves definitions similar to API.

1978



U.S. SEC issues definitions for proved reserves.

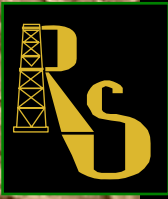
1981



SPE issues revised definitions for proved reserves.

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HISTORY OF RESERVES DEFINITIONS -3

1983



World Petroleum Congresses issued expanded definitions for reserves/resources.

1987



SPE published definitions for proved, probable and possible categories of reserves. WPC published (independent) definitions similar to SPE.

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HISTORY OF RESERVES DEFINITIONS - 4

1997



SPE/WPC jointly adopted definitions for proved, probable and possible reserves and deterministic and probabilistic methodologies.

2000



SPE/WPC/AAPG (American Association of Petroleum Geologists) approved petroleum resource definitions.



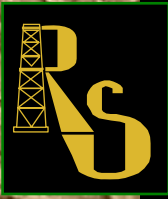
2002

Alberta Securities Commission

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RTT2: Reserves Reporting Guidelines



Sarbanes – Oxley Legislation

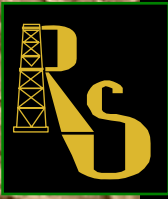
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Sarbanes – Oxley

- Law enacted July 2002 primarily in response to Enron bankruptcy
- Intended to provide investors with added assurance in the financial reporting of public companies
- Imposes direct responsibility to company executives for accurate reporting – criminal and civil penalties for non-compliance or false reporting



Sarbanes – Oxley (SOX)

- SOX requires the CEO and CFO to certify that financial reports:
 - Do not contain untrue statements or material omissions;
 - Fairly represent the financial conditions and results of operations



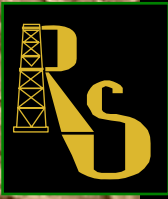
SOX continued

- SOX requires:
 - That officers of the company are responsible for internal controls that ensure that the company collects and uses proper information;
 - That those internal controls are reviewed for effectiveness 90 days before the financial reports; and
 - Any significant changes to the internal controls are reported in the financial reports.



SOX continued

- SOX creates a new agency – the Public Company Accounting Oversight Board (PCAOB)
- PCAOB, under the SEC, charged with:
 - Overseeing the audit of public companies
 - Establishing audit standards and rules
 - Inspect, investigate and enforce compliance



- SOX does not address oil and gas reserves, so why do we think this is an area of concern?

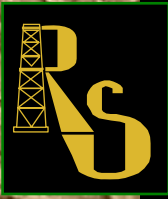
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From the PCAOB:

- “An internal control deficiency exists when the design or operation of a control does not allow the company’s management or employees, in the normal course of performing their assigned functions, to prevent or detect misstatements on a timely basis.” PCAOB Release No. 2003-017, page 15.



PCAOB

- The auditor should limit his reliance on the work of others in areas of non-routine transactions that are considered as high risk because they involve judgments and estimates.



Hydrocarbon Classification System

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Resources vs. Reserves

- In order to understand reserves, need to understand concept of resources.
- Three critical aspects
 - Maturity of project
 - Uncertainty of volume
 - Commerciality



McKelvey Box - 1972

	Discovered	Undiscovered
Commercial	Reserves	Prospective Resources
Sub-Commercial	Contingent Resources	

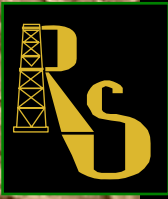
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Resources vs. Reserves

- Resources
 - Estimated recoverable portion of all petroleum quantities in-place, both discovered and undiscovered.
- Reserves
 - Those quantities of petroleum resources which are anticipated to be commercially recovered from known accumulations from a given date forward.



Classification and Status

Reserve Nomenclature

<u>Classification</u>	<u>Status</u>	<u>Abbreviation</u>
Proven	Producing	PV-PD
	Non-Producing	PV-NP
	Shut-in	PV-SI
	Behind Pipe	PV-BP
	Undeveloped	PV-UD
Probable	Producing	PB-PD
	Non-Producing	PB-NP
	Shut-in	PB-SI
	Behind Pipe	PB-BP
	Undeveloped	PB-UD
Possible	Producing	PS-PD
	Non-Producing	PS-NP
	Shut-in	PS-SI
	Behind Pipe	PS-BP
	Undeveloped	PS-UD

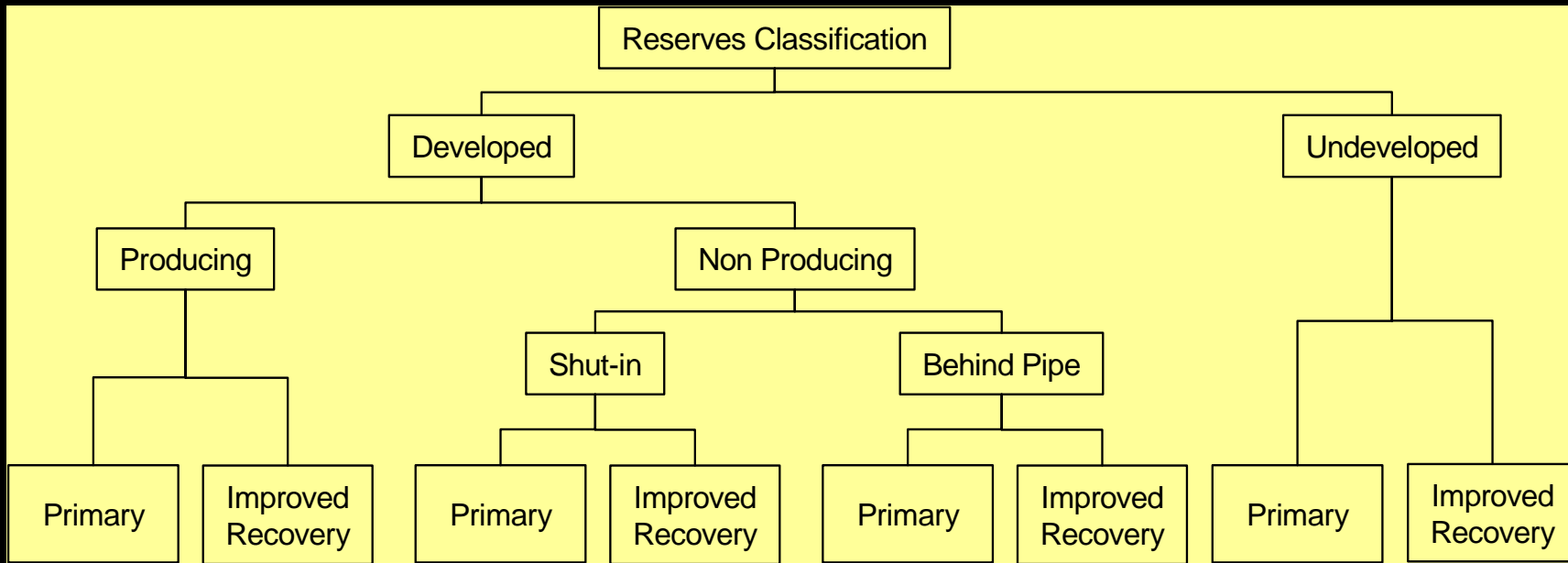
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Classification and Status

- Standard reserves flow-chart

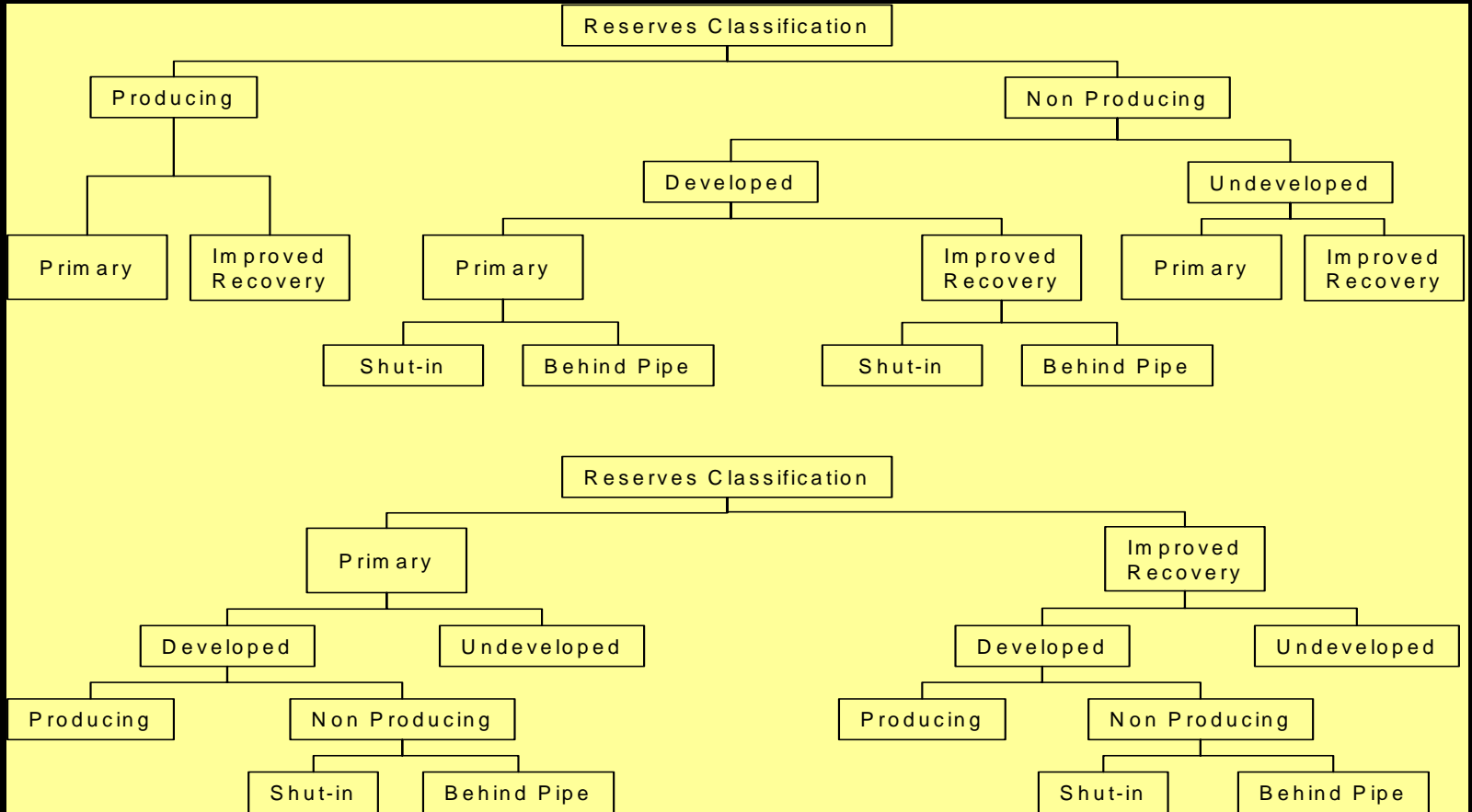


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Classification and Status



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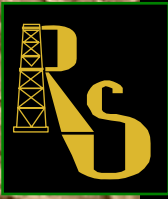


Resources Classification System

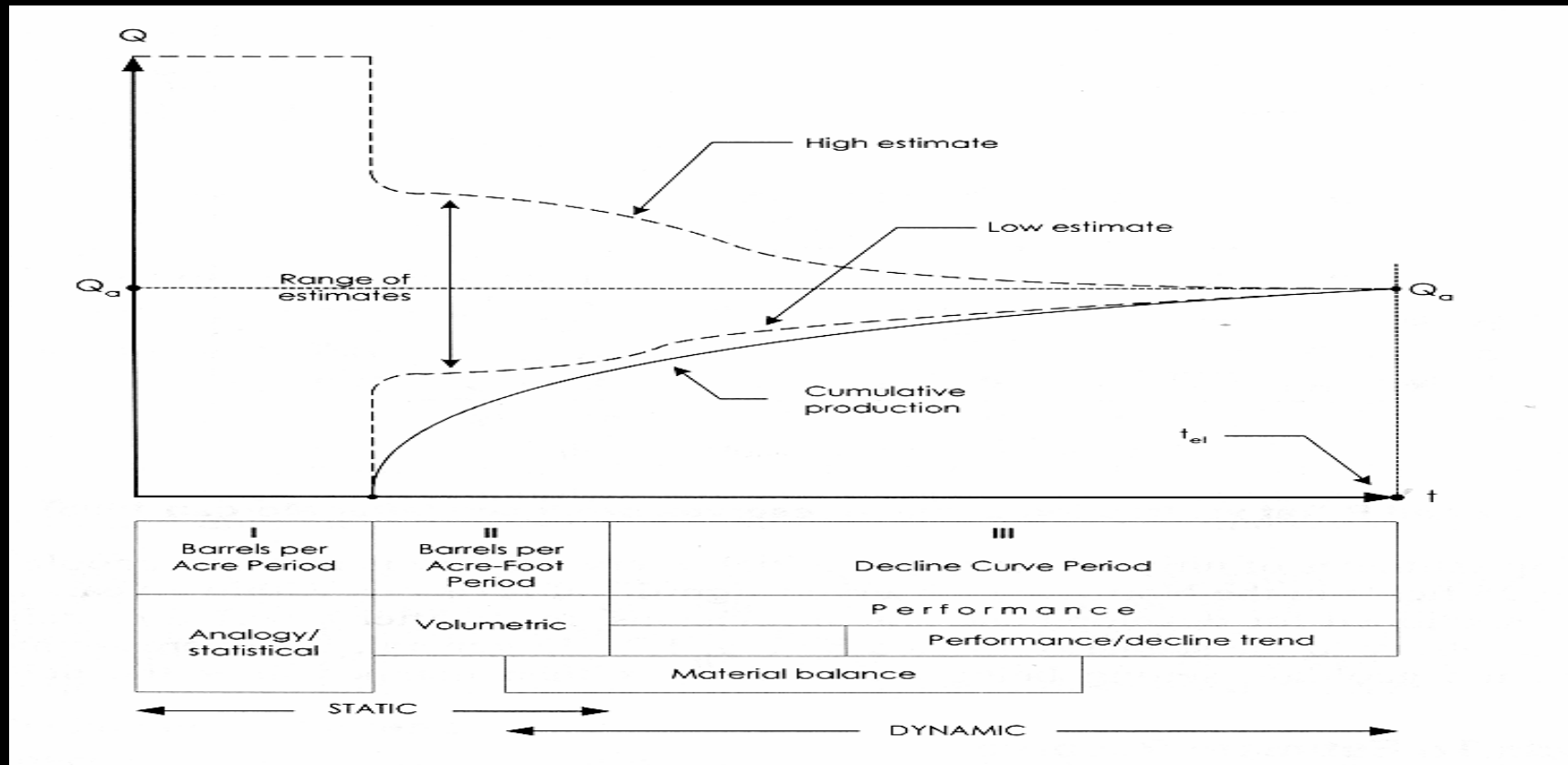
TOTAL PETROLEUM INITIALLY-IN-PLACE	DISCOVERED PETROLEUM INITIALLY-IN-PLACE	COMMERCIAL	PRODUCTION			PROJECT STATUS		LOWER RISK ↑ PROJECT MATURITY ↓ HIGHER RISK	
			RESERVES			On Production			
			PROVED	PROVED plus PROBABLE	PROVED plus PROBABLE plus POSSIBLE	Under Development			
					Planned for Development				
					Development Pending				
					Development on Hold				
	UNDISCOVERED PETROLEUM INITIALLY-IN-PLACE	SUB-COMMERCIAL	CONTINGENT RESOURCES			Development not Viable			
			LOW ESTIMATE	BEST ESTIMATE	HIGH ESTIMATE				
			UNRECOVERABLE						
		PROSPECTIVE RESOURCES			Prospect				
			Lead						
			Play						
UNRECOVERABLE									
← RANGE OF UNCERTAINTY →									

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Maturity of Asset



Original Source: Arps, J.J.: Estimation of primary oil reserves, Trans., AIME, 1956

Additional Annotation by: Cronquist, C.: Estimation and Classification of Reserves of Crude oil, Natural Gas, and Condensate", SPE 2001

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