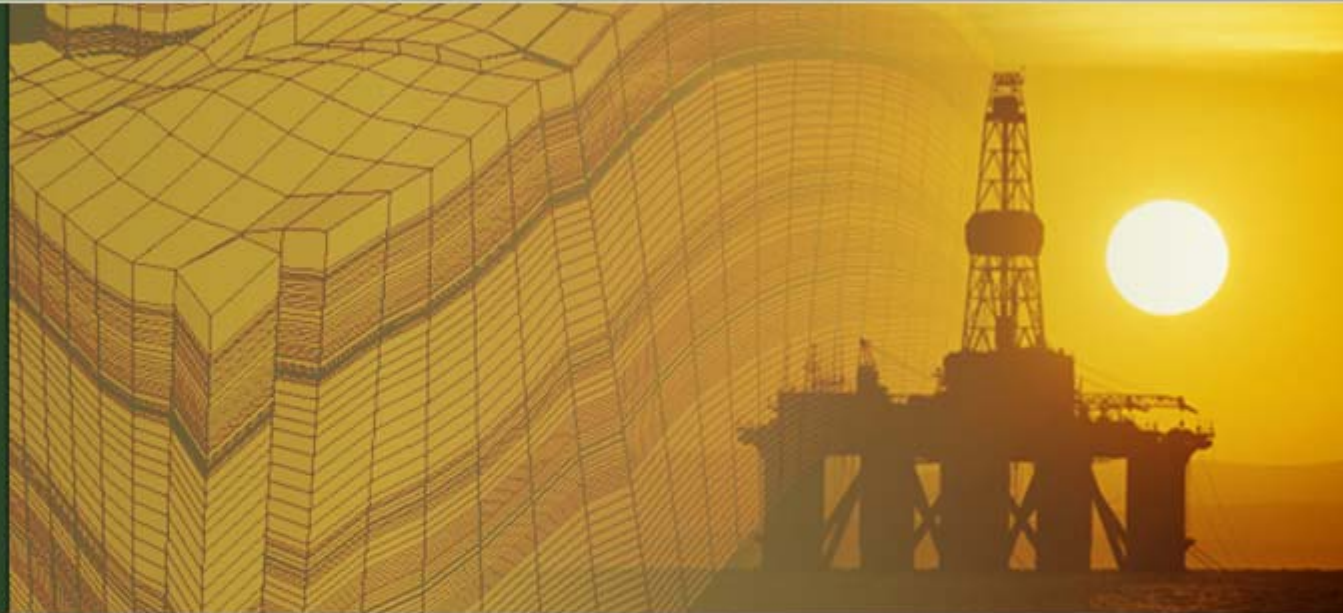




RYDER SCOTT COMPANY
PETROLEUM CONSULTANTS

Houston
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**2008 Ryder Scott Reserves Conference
Evaluation Challenges in a Changing World**

“BEYOND RESERVES VOLUMES”

Issues That Impact Your Reserves Bookings

Brad Gouge – Vice President, Ryder Scott Company



“Beyond Reserves Volumes”

...or in expanded form:

“Methods for Incorporating Costs; Pricing; Gas Shrinkage and Transport Tariffs; NGL and Inert Revenues; and Working Interest in Gas Plants and LNG Projects into Reserves Estimates”

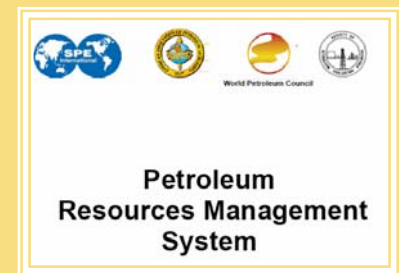
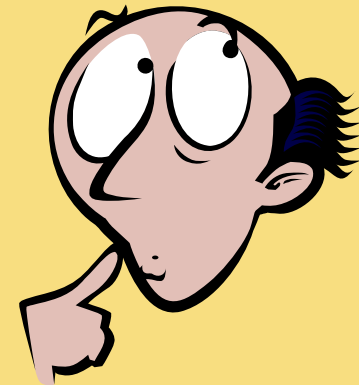
SPE Paper #110617

John McLaughlin

Brad Gouge

Presentation Outline

- Introduction & Brief History
- SEC vs. SPE-PRMS (Fairly Similar)
 - Overhead Charges
 - Contract Expiration and Renewal
 - Project Approval
 - Reference Point
- SEC vs. SPE-PRMS (Notable Difference)
 - Non-Hydrocarbons
 - Commodity Pricing
 - Bitumen and Coal Bed Methane
 - Injection vs. Re-Injection
- Conclusions





Introduction

- The SEC and SPE-PRMS guidance is different for some topics related to “above ground” parameters
- Purpose of this paper is not to pass judgment on either set of definitions, but rather provide guidance for reserves estimating
- Presentation will focus on SEC and SPE-PRMS proved definitions
- Paper discusses SPE-PRMS probable and possible classes in some instances
- Paper and presentation represent authors’ interpretations of SEC and SPE-PRMS guidelines



How did we get here?

- **1936-1964** **API established standards for “proved reserves”**
- 1940-1945 API revised definitions & attempt to standardize
- 1946-1975 AGA joined API in annual publications of proved reserves
- 1965 SPE reserves definitions in close agreement with API
- **1978** **SEC published reserves definitions**
- **1979** **“Standards pertaining to the estimating and auditing of oil and gas reserves information” adopted by SPE**
- 1984 SPEE established reserves definitions committee
- 1985 SPE appointed task force to work with SPEE
- 1987 SPE definitions published
- 1988 SPEE published “Guidelines for application of the definitions of oil and gas reserves”
- 1989 SEC includes coalbed methane as reserves
- 1995 SPE and WPC issue draft “Petroleum reserves definitions”
- 1997 SPE-WPC definitions
- 2002 Sarbanes-Oxley Act
- **2007** **Updated SPE/SPEE/AAPG/WPC Definitions**



Incorporating Overhead Charges

What **is** overhead and what **is not** overhead?





Incorporating Overhead Charges

- SEC guidance for inclusion or exclusion of overhead charges is such that –
 - *“...general corporate expenses and interest expenses not to be added to or deducted from the results of operations to an enterprise’s oil and gas producing activities because the **allocation** of those expenses would be **subjective** and would tend to **decrease the comparability** of the disclosure.”*
- In other words, the entity should include only general and administrative costs that can be tied directly to a particular field’s operations



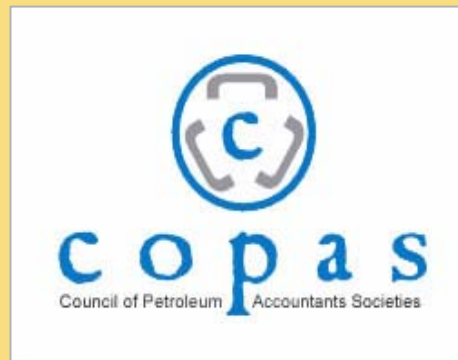
Incorporating Overhead Charges

- SPE-PRMS provides guidance of –
 - “Operating costs should **include** fixed **property-specific** overhead...and should **exclude**...any overhead **above that required to operate** the subject property itself”
- Again, as with SEC guidance, costs should include those that can be tied directly to a specific property
- If operations cease, then will the cost no longer exist? If the cost goes away, then this portion of overhead is to be included in the economic limit calculations for that property

Incorporating Overhead Charges

What about COPAS charges?

- COPAS – Council of Petroleum Accountants Societies
- Provide operators with escalation factors to be applied to predetermined producing and drilling charge-out rates to partners





Incorporating Overhead Charges

- SEC and SPE-PRMS share similar views on this topic of COPAS overhead expenses
- No written guidance, but the SEC provided informal guidance at a 2002 SPEE forum
 - In essence, **non-operated** properties **should include** COPAS overhead charges
 - However, **operated** properties **should not include** charged-out COPAS overhead charges as profit or reduction in expenses





Contract Expiration and Renewal

- SEC guidance stipulates -
 - *“Automatic renewal of such agreements cannot be expected if the regulatory body has the authority to end the agreement unless there is a **long and clear track record** which supports the conclusion that such approvals and renewal are a matter of course.”*
- SEC Example
 - LUKOIL in Former Soviet Union
 - “The Russian Experience in Reserves Submissions to the SEC” [SPE Paper # 95849-MS]





Contract Expiration and Renewal

- SPE-PRMS outlines similar requirements as SEC for Proved reserves
 - *“**Reserves** should not be claimed for those volumes that will be produced beyond the ending date of the current agreement unless there is **reasonable expectation** that an extension, a renewal, or a new contract will be granted”*
- Additionally SPE-PRMS has framework for volumes that would be recovered outside the current contract life
 - If there is **not reasonable expectation** then - *“...forecast production beyond the contract term should be classified as **Contingent Resources** with an associated reduced chance of commercialization”*



Project Approval

- SEC states –
 - “A **commitment** by the company to develop the necessary production, treatment and transportation infrastructure is essential to attribution of proved undeveloped reserves.”
 - “The **history of issuance** and continued recognition of permits, concessions and commerciality agreements by regulatory bodies and governments should be considered...”
- Also, SEC requires reasonable certainty of procurement of project financing
- In most cases, funding and approvals need to be “in hand” prior to booking proved reserves using SEC guidelines

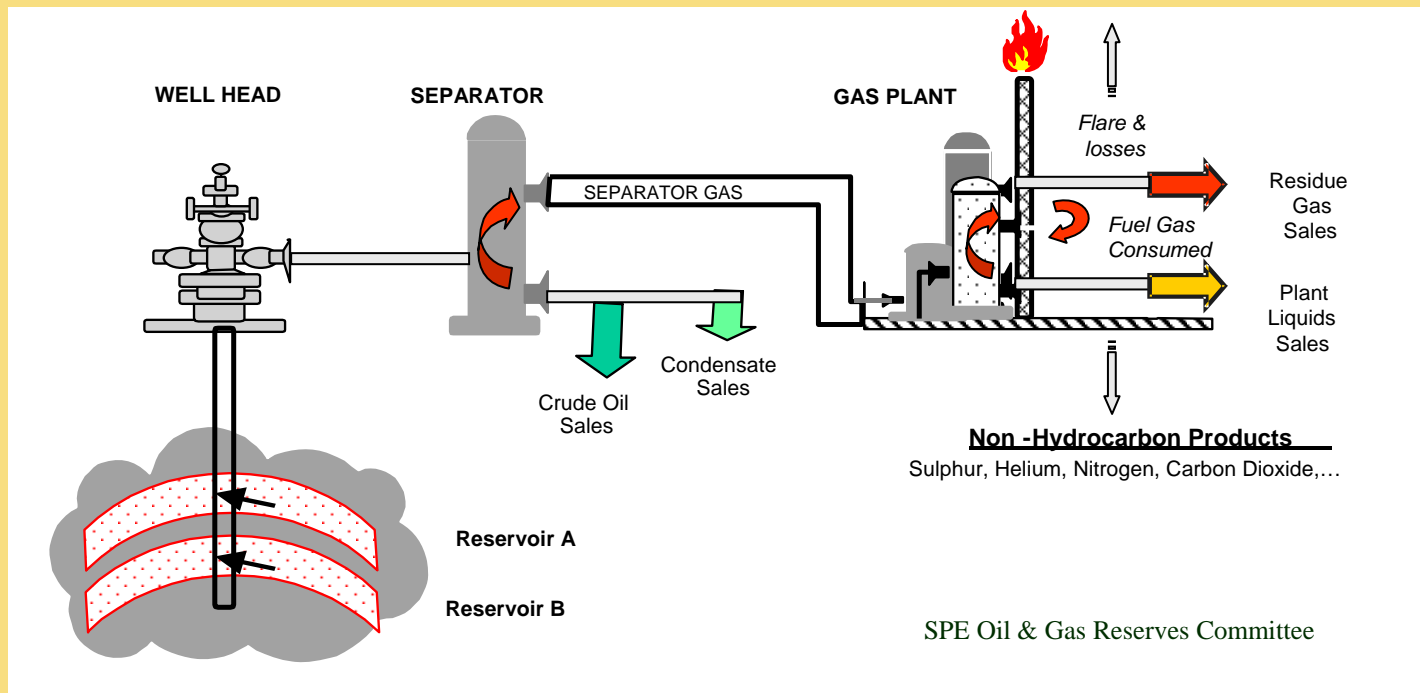


Project Approval

- SPE-PRMS states –
 - *“While SPE guidelines do not require that project financing be confirmed prior to classifying projects as Reserves, this may be another external requirement.”*
- If financing is **reasonably expected** but not yet confirmed, the project may be classified as **Reserves**
- Project should be classified as a **Contingent Resource** by SPE-PRMS guidelines if there is **not reasonable expectation** of financing

Reference Point

- SEC and SPE-PRMS proved guidelines are often interpreted to require reserves volumes to be calculated using the **point of sales** as the reference point



Reference Point

- SEC provides guidance that prices, costs, and volumes should normally tie to the defined reference point
- SPE-PRMS provides additional clarification stating that “...in integrated projects, the appropriate prices at the reference point may need to be determined by using a **netback calculation.**”
- How does this impact LNG projects?





Non-Hydrocarbons

- In general, the SEC prohibits the inclusion of non-hydrocarbons in reserves summaries
- In certain specific cases, the SEC may allow **immaterial** amounts of non-hydrocarbons to be included in the reserves base as long as the gas composition meets the agreed specifications at the reference point
- SPEE recommends not to include non-hydrocarbon components as reserves in SEC studies



Non-Hydrocarbons

- SPE-PRMS approach allows for inclusion of non-hydrocarbon components as reserves as long as composition meets agreed specifications at the reference point
- Associated non-hydrocarbons removed **prior to the reference point** are not considered reserves under the SPE-PRMS guidelines
 - Helium
 - Sulfur

Non-Hydrocarbons

- Reserves may be similar between SEC and SPE-PRMS in areas where network specifications allow only low amounts of non-hydrocarbons
- Reserves differences may be great in certain parts of the world
 - Miskar Field in Tunisia
 - Local market accepts 16.9% nitrogen



Commodity Prices

- SEC stipulates –
 - *“Future cash inflows...shall be computed by applying year-end prices oil and gas related to the enterprise’s proved reserves to the year-end quantities of those reserves.”*
- SEC release in 2000 provided additional clarification specifying use of **spot prices** adjusted for differentials
- In areas where there is an **established market** but no contract in place at year-end, then sales prices from analog properties should be used





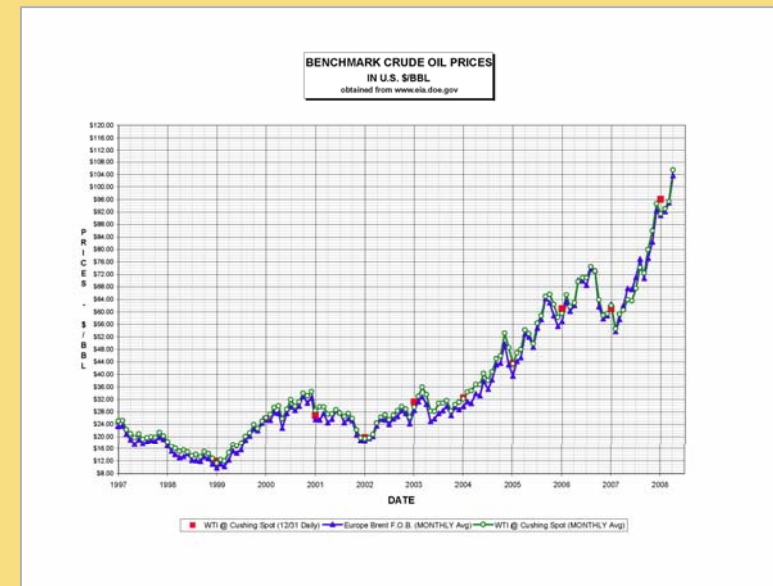
Commodity Prices

- SPE-PRMS guidance states –
 - *“The economic evaluation underlying the investment decision is based on the **entity’s reasonable forecast** of future conditions, including cost and prices which will exist during the life of the project (forecast case)”*
- May be based on internal future pricing estimates selected by the company
- Consistent and appropriate market prices should be used for all properties in a given evaluation
- SPE-PRMS provides latitude to use pricing scenarios that would comply to regulatory agency filings



Commodity Prices – Price Hedges

- **SEC** reserves disclosures require the use of year-end market prices unless the hedging is **property specific**
- **SPE-PRMS** does not provide explicit hedging guidance, but the statement of **reasonable forecast** would allow the inclusion of price hedge contracts for reserves determinations



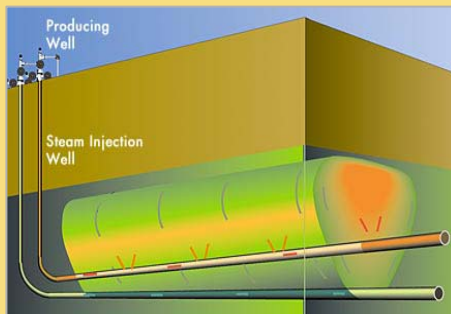


Bitumen and Coal Bed Methane

- SEC requires “natural state and original location” specifications for oil and gas to be deemed reserves
- Hydrocarbons **mined** from tar sands **are not** considered reserves by the SEC
- Liberated gas during **coal “processing”** is not deemed reserves by the SEC
- **Coal Bed Methane** recovered from **conventional** wells **is** allowable SEC reserves

Bitumen and Coal Bed Methane

- SPE-PRMS state –
 - “[SPE-PRMS] resource definitions...will be appropriate for **all types** of **petroleum** accumulation **regardless** of their **in-place characteristics, extraction method applied, or degree of processing required.**”
- SPE-PRMS does stipulate that increased sampling density may be needed of hydrocarbon mining operations to better define in-place volumes



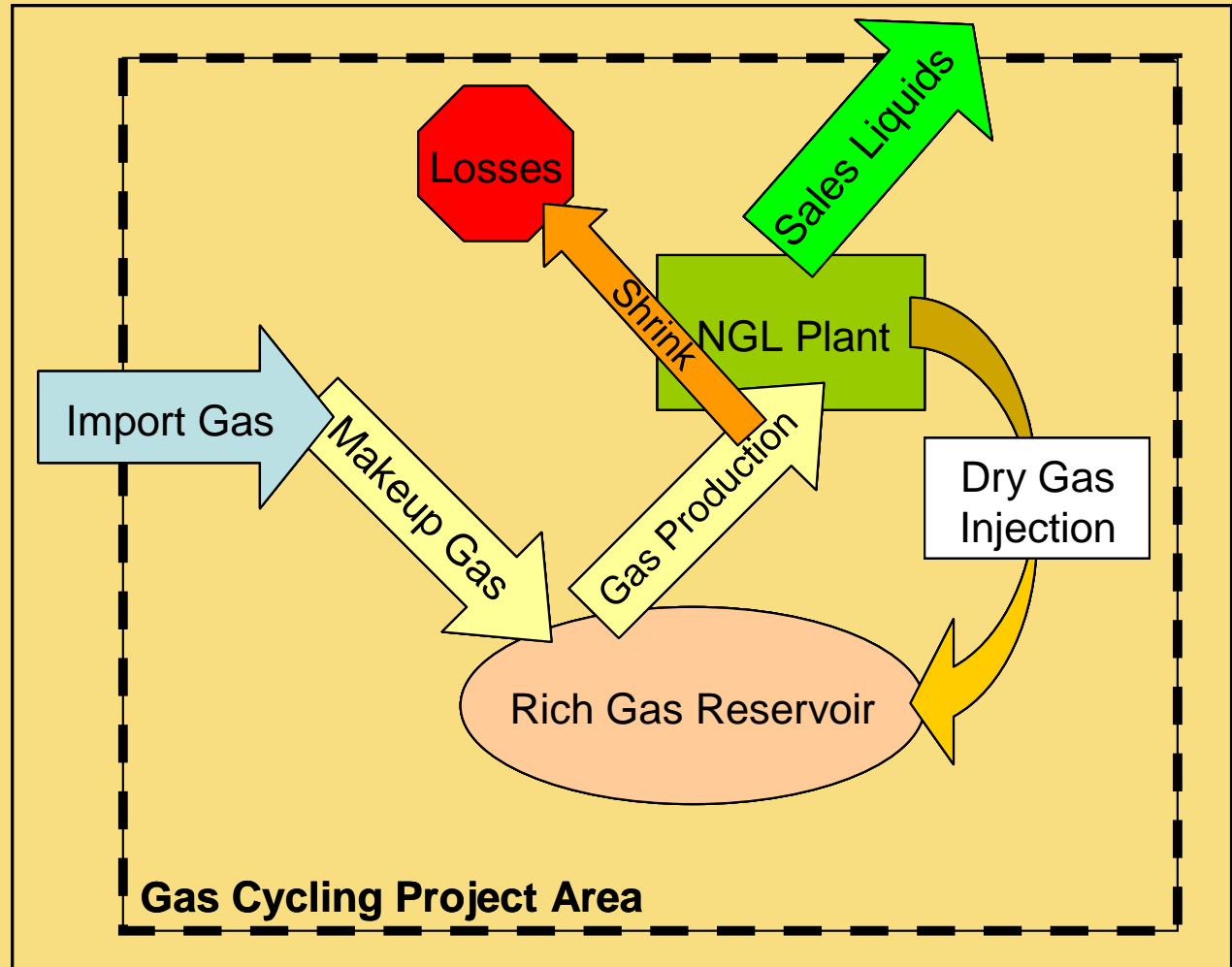


Injection versus Re-Injection

- Injection is defined as putting gas produced from one reservoir into a different non-native reservoir
- Re-injection is the process of returning produced gas back into its native reservoir
- SEC definitions interpreted to support only the strictest use of the term re-injection
- SPE-PRMS provides flexibility to include gas re-injection into the same reservoir or into other reservoirs located on the same property

Injection versus Re-Injection

- Evaluators often use the occurrence of ownership transfer to determine if gas can be considered “re-injected”
- Volume accounting can become quite complex in gas cycling projects





Conclusions

- SEC and SPE-PRMS provide guidance to include COPAS charges for non-operated properties while excluding as revenue or cost reduction for operated properties
- Both the SEC and SPE-PRMS require “reasonable certainty” of a contract extension for proved reserves
- In practice, both the SEC and SPE-PRMS require project approval and financing be “in hand” prior to booking proved reserves
- In general, the SEC prohibits the inclusion of significant non-hydrocarbons in reserves summaries, whereas the SPE-PRMS will accept those volumes as reserves that meet the agreed compositional specifications at the reference point



Conclusions

- The SEC requires the use of year-end spot pricing for reserves and value determinations, whereas the SPE-PRMS provides for the use of a reasonable price forecast to be used consistently throughout the evaluation
- The SEC does not allow the booking of any oil or gas reserves that are recovered through mining while the SPE-PRMS does allow mined hydrocarbon volumes to be classified as reserves
- The SPE-PRMS allows injected gas from nearby reservoirs that has never been sold to be classified as re-injected gas, whereas the SEC implies injected gas be returned to the exact reservoir it was produced from to be classified as re-injected



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- **Slide 19** - Statement of Financial Standards No. 69, “Disclosure about Oil and Gas Producing Activities”, Financial Accounting Standards Board, November 1982