Possible topics to cover for WOC 1 during 2012-2015 triennium

SG 1.1 & 1.2

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Status of reserves and exploration

- Main remaining reserves in E&P
  - Brownfields
  - Sour fields
  - Stranded fields
  - New exploration areas
  - Unconventional sources (Shale gas, tight gas, CBM)
  - New sources (Methane Hydrates, Low pressure)
  - Associated gas?

Brownfields

- Definition
  - An oil or gas accumulation that has matured to a production plateau or even progressed to a stage of declining production.
- Challenge
  - To extend the economic producing life of the field using cost-effective, low-risk technologies.
- Technologies used
  - Stimulation (acid)
  - Refracturing
  - Polymer injection
  - Artificial lift
  - Smart completion
- Chapters to cover :
  - Assessment of reserves in Brownfields ?
  - Chapters on each technology?
  - Economic and tax incentives?

Sour gas fields

- Definition
  - Gas fields that are acidic either alone or when associated with water. Main sour gases in E&P are H_2S (hydrogen sulfide), and CO_2 (carbon dioxide).
- Challenge
  - To produce and process these fluids, with the constraints on HSE and equipment
  - CO2 : transforms into carbonic acid with water. This acid causes corrosion of metal but also formation of calcium carbonate scale [$CaCO_3$] by reaction of bicarbonate [HCO_3^-] and carbonate [CO_3^{-2}] salts or ions with calcium.
  - H2S : An extraordinarily poisonous gas, that is lethal and even harmful at low concentration. At low concentrations, H_2S has the odor of rotten eggs, but at higher and lethal concentrations, it is odorless. Awareness, detection and monitoring of H_2S is essential. In addition to its poisonous effect,H_2S causes corrosion cracking of metal and requires costly special production equipment such as stainless steel tubing
- Technologies used
  - Detection systems
  - Corrosion control
  - Scavengers
  - Separation/processing techniques
- Chapters to cover
  - Assessment of reserves in Sour gas fields
  - State of art of Current Challenges/ technologies

Stranded fields

- Definition
  - A stranded gas field is a field that has been discovered, but remains unusable for either physical or economic reasons. Generally, conventional means of transportation via pipeline is not practical or economical
  - Some reports indicates that 80% of current 142 tcm discovered reserves are classified as stranded 20000 fields(tbc)
- Challenge
  - Remoteness from a market for natural gas, making construction of exports expensive.
  - Saturation of local market
  - Small gas fields, that are uneconomic to develop
- Technologies used
  - FLNG
  - Compact GTL plants
  - CNG transport
  - Process progress (Subsea dehydration processing, allowing long pipelines)
  - …
- Chapters to cover
  - Assessment of reserves in stranded gas fields ?
  - State of art of Current Challenges/ technologies
  - Economic incentives and state regulations (small fields incentives….)

Associated gas

- Definition
  - Associated gas is gas dissolved in oil, that is produced simultaneously with liquid.
- Challenge
  - Assessment of associated gas reserves
  - Monetization of gas (export infrastructure, re-injection…)
  - Recovery of gas after oil production
- Technologies used
  - …
- Chapters to cover
  - Assessment of gas reserves in oil fields ?
  - Incentives to favour associated gas production
  - Gas flaring reduction initiatives

Frontier exploration areas

- Definition
  - a basin or a play where the exploration activities have not been carried out sufficiently, and where it is considered that there is a significant part of hydrocarbon that could be categorized as undiscovered volume
- Challenge
  - Improve acquisition of data
  - Access to deep / challenging environments
- Technologies used
  - deep see drilling, and deep wells
  - Progresses in imaging (Subsalt, sub-basalt, multi azimuth, inversion progresses ….)
  - Arctic condition exploration
  - …
- Chapters to cover
  - re-evaluation of recent advances in frontier basins
  - State of art of Current Challenges/ technologies

Unconventional

- Definition
  - refers to gas resources which unlikely classical reservoirs are not confined by geological discrete boundaries, are regional in extent, not buoyant upon water, and subject to abnormal pressures.
  - Tight sands, Shale gas and CBM are main classifications
- Challenge
  - Prediction of reserves/flowrates
  - Sustainability
  - Heterogeneity of production
  - Environmental impact (site pads, water use, fraccing)
  - Acceptance
- Technologies used
  - Rock Physics studies
  - Well fraccing (efficiency, low water use…)
  - Well design
  - …
- Chapters to cover
  - Review of reserves and production areas
  - Acceptance
  - Evolution on techniques

New sources ?

- Definition
  - Refers to new gas resources which are not presently produced
  - Hydrates, Abiogenic
- Challenges
  - Identify methane concentrated zones
  - Define and improve production methods to reach economicity (nrj and cost)
- Technologies used
  - Hydrate : depressurization method-based approach ?
  - …
  - Concepts of charge
- Chapters to cover
  - Review of reserves and production areas
  - Evolution on techniques and expected future