Introduction to Hydrocarbon Management and allocation

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Hydrocarbon Management

• Hydrocarbon Management is about handling the hydrocarbon accounts and all the business related reporting in accordance with governmental requirements and contractual agreements to protect and assure the owners share of production from the field(s).

• The hydrocarbon Management shall ensure that all data and information used in all types of official reports is uniform and from a single verified source with a high level of quality and integrity in a way that prevents possible financial and reputational risks.
Mass balance

- Mass balance of the fluids at the facility.
Mass balance

• Define all in-, out streams.
• Sufficient measurement of the in- and out streams.
• Define all figurative derived/ calculated streams needed for allocation and reporting.
Computer based report system

- A system to monitor, record, verify, approve, calculate and report the flow of hydrocarbons in accordance with authority regulation and contractual agreements with Partners, pipeline operators and Tie-in fields.
Hydrocarbon Management processes

- Describe processes
Allocation

The word «allocation» is used in relation to divide, share, split or distribute.

- Well allocation
- Field allocation
- Pipeline allocation
Allocation

• Well allocation:
  – Proportional dividing of the production/sale back to each individual production well.

• Field allocation:
  – Proportional dividing of the comingled export/sales back to each individual field/license/equity share.

• Pipeline allocation:
  – Proportional dividing of the pipeline output between the shippers for lifting and sale.
Tie-in fields and field allocation

• With tie-in of a new field to an existing facility the field allocation can be done in different ways:
  • pro rata
  • by difference
  • well production
Pro rata allocation

- Measurement of all in and out streams, both for the tie-in and existing facility.
- Pro rata correlation of all in streams to match the out stream.
- Distribution of low uncertainty to all fields.

Allocated out$_x = \frac{\sum out}{\sum in} \ast measured in$_x
Allocation by difference

• No measurements of the production for one of the fields/licenses, usually the main facility.

• The unmeasured production is determined by:
  Field = Export – tie-in export

• To minimize the uncertainly on the unmeasured stream, the smallest producer should be measured and recommended not be more than 10% of the total production.
Field allocation by well production.

- Summarizing the production of the individual wells based on well allocation for a license.
- Used between licenses with equal or small difference in equity shares.
- No measurement to give the total in-stream.
- Is usually based on volume.
- High uncertainty.
Field allocation

• should be based on mass and not volume, since hydrocarbon flow from two different fields are not compatible homogeneous mixtures.
  
  $1\text{Kg} + 1\text{Kg} = 2\text{Kg}$
  
  $1\text{Sm}^3 + 1\text{Sm}^3 \neq 2\text{ Sm}^3$

• Mass should be divided into mass and moles per component N2, CO2, C1 .....C7+ (or higher) and summarized pr component based on the component analysis of the fluids.
Allocation story...
Once upon the time.....
Then decline production and tie-in...
Decline production, spare capacity and new tie-in. The facility is not the main producer anymore......
Lived for ever more....
Questions?

• What is the uncertainty for the “by difference” field over the years?
• Do we have a common standard for this work, that include the process and capacity issues and not only the equipment uncertainty?
• How to handle corrections in complex allocation systems?