



ADVANCED MODELLING & SIMULATION – AMS

OIL & GAS (2) : FLOW ASSURANCE

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OFFER OF SERVICES

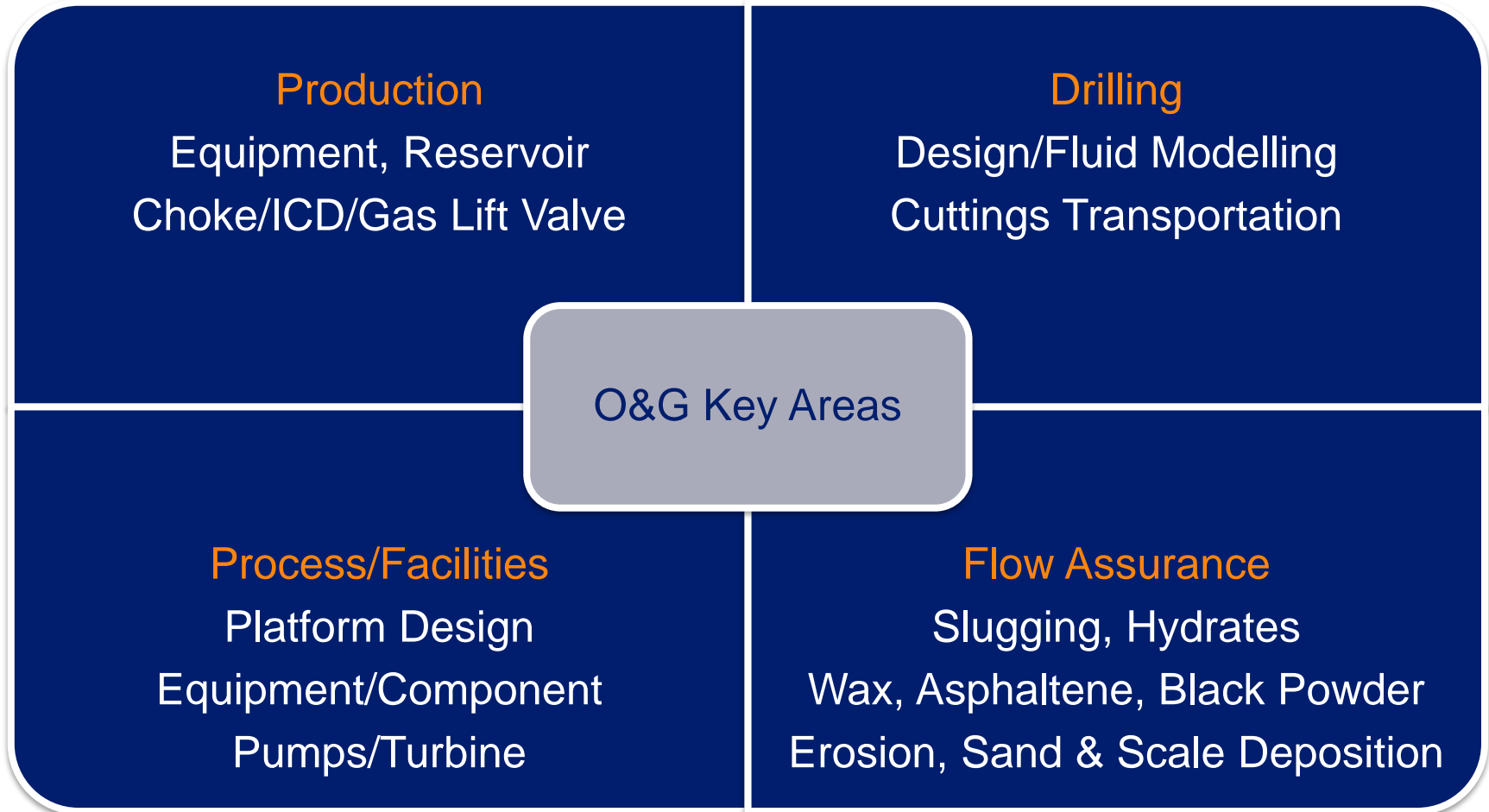
Pöyry AMS group:

- Pöyry's reputation in engineering services is worldwide acknowledged
- Pöyry's AMS has expertise in the 3D simulation (CFD & CMFD) of oil & gas flows using their own simulation platform TransAT
- The AMS group adapts and implements models required by the clients to meet their interests and solve their pressing problems
- New projects are ongoing with potential customers.

Our Offering:

- If there is an interest in consulting then Pöyry AMS can prepare a project work and financial plan
- Alternatively, Pöyry can license its TransAT CFD/CMFD tool under competitive conditions to the clients.

TYPICAL O&G APPLICATION AREAS REQUIRING CFD/CMFD



2- FLOW ASSURANCE

The Challenges:

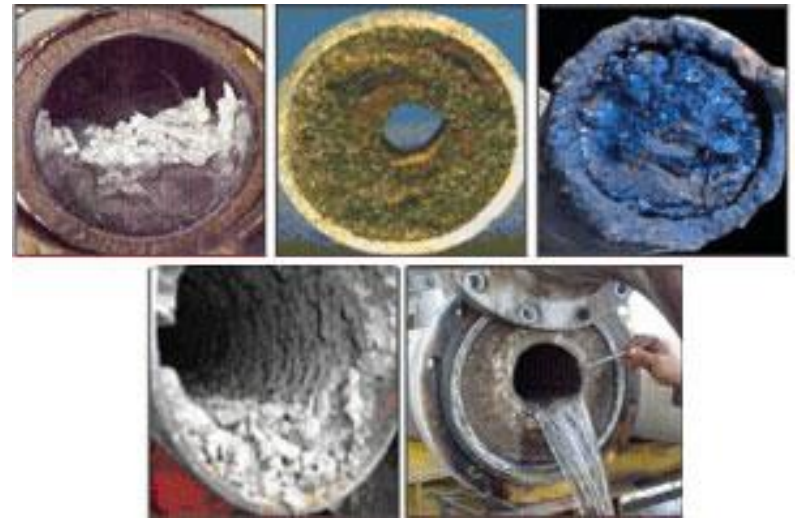
- Companies face several production challenges in designing and operating long multiphase flow pipeline systems.

Typical consequences:

- Interrupted production (due o solids deposition & subsequent blockage formations in pipelines)
- Risk of accidents & asset damages
- If unmanaged, high costs threaten company's profits and legal issues.

Benefits of using CFD/CMFD:

- Understand better production systems
- Ability to predict its behavior and prevent flow assurance issues.

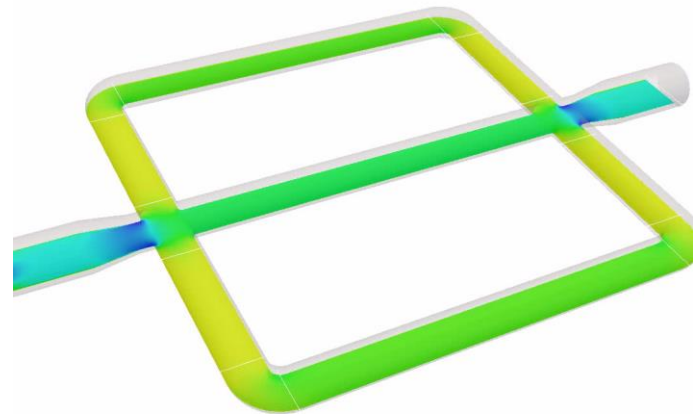


MAL-DISTRIBUTION OF PHASES IN MANIFOLDS

- Uneven Split “Mal-Distribution” In manifolds causing equipment’s performance unbalance.
- Phase distribution and solids transport control Carry-Over & Carry-Under.

Why CMFD?

- Can simulate flow patterns and phase distributions in manifolds and splits
- Help understand solid particle preferential concentration and distribution in the conduits.



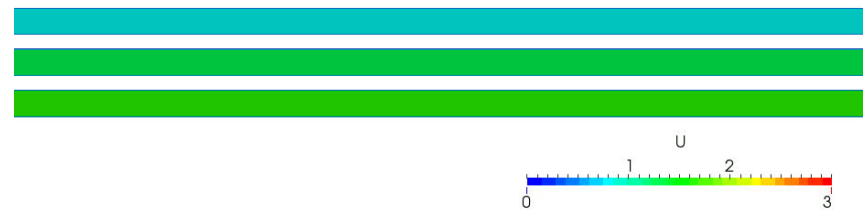
BLACK POWDER IN GAS PIPELINES

- Black powder causes blockage of gas pipelines, interrupting the flow assurance, and may lead to accidental releases of toxic materials in the atmosphere.



Why CMFD?

- Simulate flow details, including critical/threshold flow velocity for powder build up and removal,
- Intervene where simplified 1D models fail to predict,
- Help prevent costly production disruptions with black powder slugging & pipe blocking.

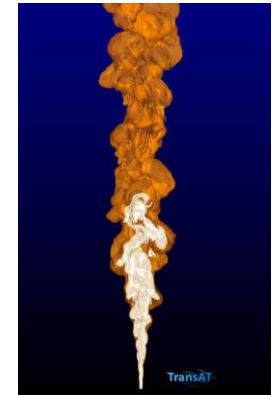
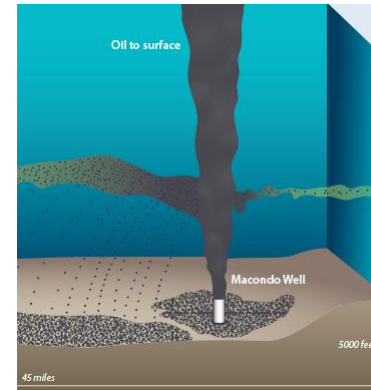


SUBSEA OIL BLOW OUT

- A subsea oil spill can cause irreversible environmental damages, with high costs (\$ billions) and litigation issues.

Why CMFD?

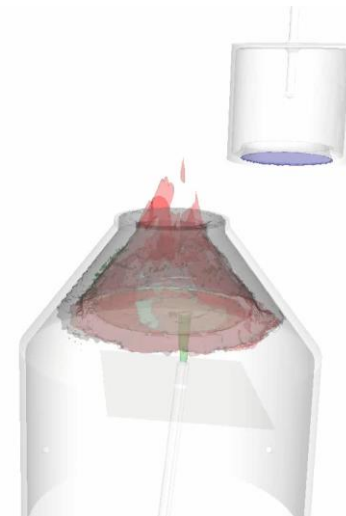
- Lesson learnt from BP spill → efforts to create a safety passive containment system
- Understand the complex subsea flow behaviour near spill
- Screen simple passive safety containment systems
- Optimize the design (incl. chem. Inhibitors injection) and robot deployment of containment.



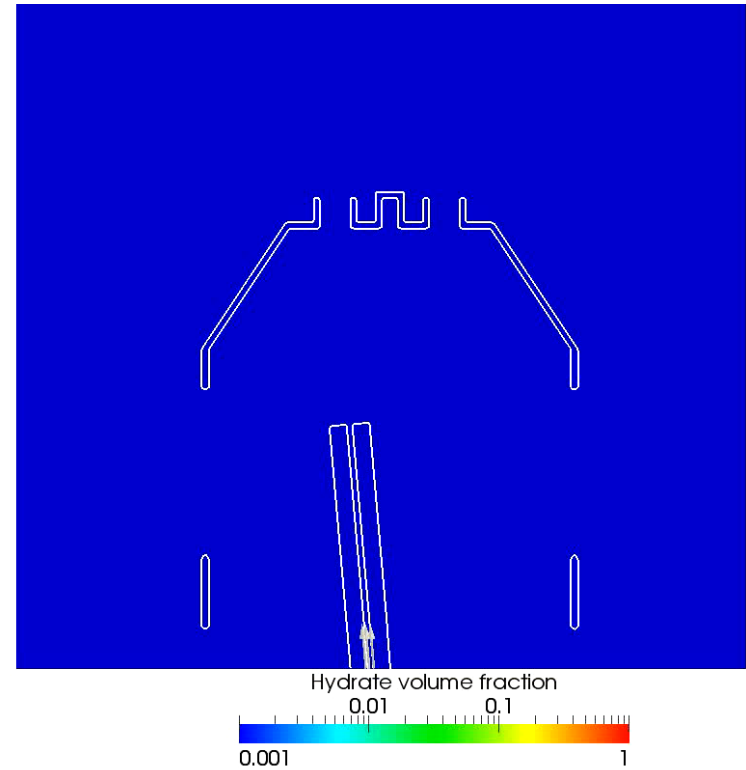
TransAT

Sticking hydrates 50%
Hydrates in bulk 5%
Gas 10%
Dead oil 50%

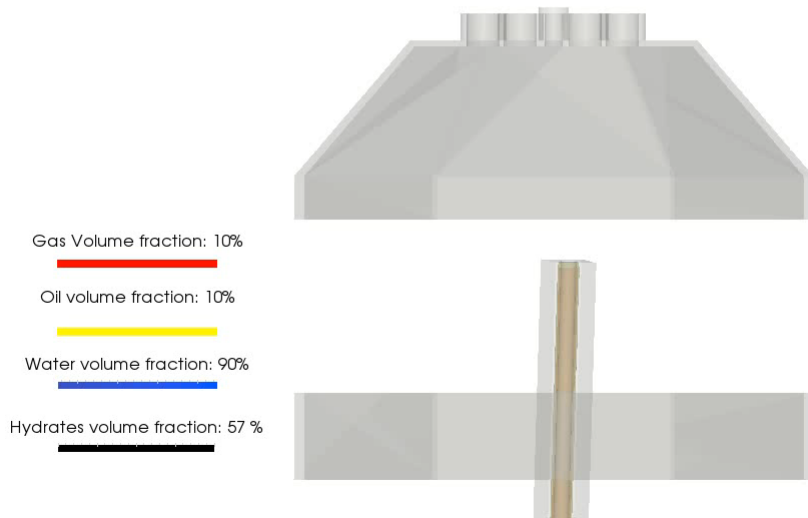
Time: 2.4 min



CAPPING THE MACONDO WELL



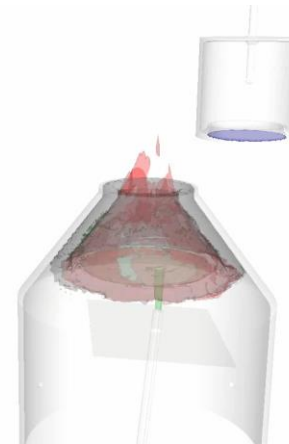
HYDRATE PLUGGING OF AN UNDER-DESIGN DOME



TransAT

Sticking hydrates 50%
Hydrates in bulk 5%
Gas 10%
Dead oil 50%

Time: 2.4 min



LOSS OF BUOYANCY UNDER FLOATING PLATFORMS

