

EOR – Subsea?! Background

- Recovery potential , Well maintenance
- Less wells – larger well spacing
- Deep water
- Capex / opex – economic view (not justify platform)
- handling facilities – vessels – limited
- New technology – water treatment (SWIT), subsea pumping (10 years ago not solved)

EOR – Subsea?! - Challenges

- Monitoring (manifolds), tracers incomplete understanding
- Make Subsea practical – how?
- What happens in the reservoir real time – injector –producer.? Cross well monitoring, -EM, -seismic. (access)
- Monitoring back produced chemicals, injected chemicals
- Regularity – maintenance (membrane unit, ion removal, different process)
- Risk exposure – chemical – what might happen in the reservoir?
- Environmental issues – reinjection of chemicals – FMC – Tordis – has a solution
- Degradation of chemicals – cost
- Down hole viscosity measurement gear – viscosity in the reservoir
- Discover and handle a bad badge of chemicals
- PDO stage – choose the right equipment (triplex pump, burry pipelines...etc.)
FLEXIBILITY!
- Polymer will come back – monitor and handle
- Expert knowhow, competence – BOTTLENECK! (also for platform wells)
- PEOPLE - skills

EOR – Subsea?! Vision

- PDO include EOR thinking – flexibility -(primary, secondary and tertiary methods [EOR])
- Synergy – use a cocktail of EOR methods in different reservoirs (fields) - COOPERATION
- Well slots, connections to installations, accesible connections, "weight", "space", technology - fit for purpose
- Vessels for chemicals – shuttling – plug and play 5 days and then go away!
- Hubs for chemicals, membrane units
- Tank, separation unit on the seabed
- **Pilot, train, people, skills – Do you want to follow me?!?!**
- Fond – Louisiane test field - see and experience
- Incentives for EOR (tax, lisenche periode)
- JIP (NPD-government focus) – pilots benefit the industry
- Downhole processing (water separation), Scale-, sand removal