

FLOW ASSURANCE & FLUID ENGINEERING

FIELD DEVELOPMENT CHALLENGES

Hydrates
Wax
Emulsion
Rheology
Sand
Slugging
Corrosion

Normal Operation
Shutdown
Startup
Turndown
Pigging

Increasing Water Depth
Joule Thompson Cooling
Riser Static Pressure

Low Reservoir Pressure/Temperature

Long Distance Tie-backs

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Steady State / Transient Analysis

Steady state and transient simulation of multiphase well, pipeline, riser systems, production networks, injection systems including deepwater and subsea development for design and operation purposes.

System Optimization / Debottlenecking Analysis

Optimization and debottlenecking analysis to identify constraints in oil and gas integrated production networks to optimize production, gain maximum revenue and reduce capital investment as well as operating expenditure for higher productivity and efficiency.

Flow Assurance Operability Study

Specific requirement to predict flow assurance challenges such as Slugging, Hydrate, Wax / Asphaltene, Erosion, Corrosion, Emulsion, Scaling phenomena in transportation and production systems.

Advanced Flow Assurance Laboratory

Laboratory services for hydrocarbon properties; Wax, Emulsion, Scale, Hydrate, Asphaltene, Corrosion including chemical screening and compatibility studies.

Fluid Engineering Services

Specialised services include Computer Aided Engineering (CAE), Computational Fluid Dynamics (CFD) and Finite Element Analysis (FEA) for subsea, pipeline, process facilities, structural and safety studies.

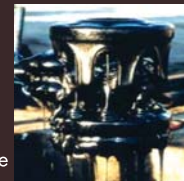
Hydrate

- Chemical Compatibility
- Hydrate Phase Boundary
- Low Dosage Inhibitor Performance
- Hydrate Formation/Dissociation



Wax

- Pour Point
- Rheology & Gel Strength
- Wax Content & Deposition
- Chemical Screening
- Wax Appearance/Melting Temperature



Scale

- Water Analysis
- Scaling Tendency
- Scale Formation
- Chemical Screening



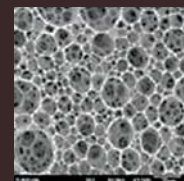
Corrosion

- Inhibitor Screening
- Failure Analysis
- Corrosion Evaluation & Testing
- Corrosion Inhibitor Performance



Emulsion

- Formation Tendency
- Emulsion Stability Test
- Chemical Screening
- Emulsion Rheology



Asphaltene

- Onset/Offset Pressure
- Particle Size Analysis
- Asphaltene Deposition
- Saturates-Resin-Asphaltene-Aromatics
- Blending Stability
- Chemical Screening

