

# TEASISTEMI

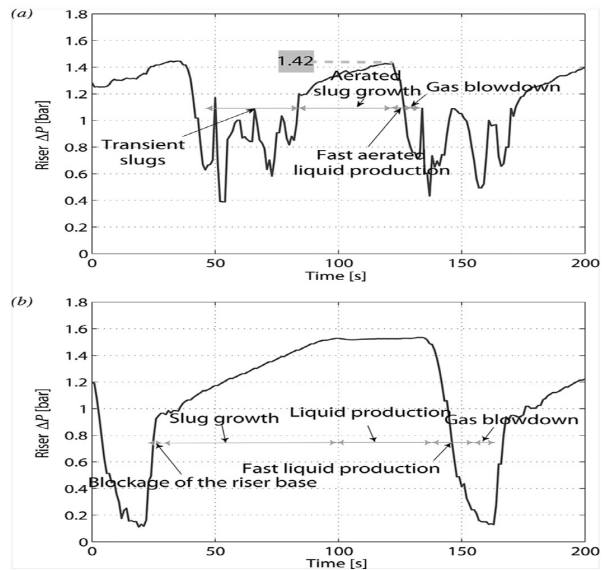
ENERGY AND ENVIRONMENT TECHNOLOGIES

## FLOW ASSURANCE

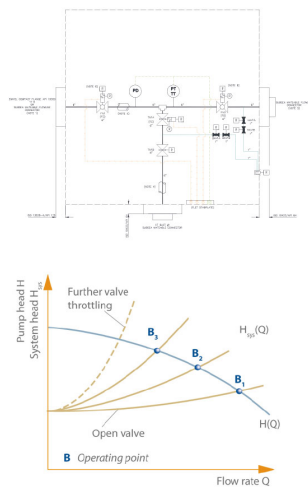


# Phenomenological understanding

- Flow Assurance analyses start from physics understanding of phenomena driving a given production scenario
- TEA Sistemi experience in multiphase flow modelling is crucial in this phase, giving the chance to properly evaluate computer code simulations and identify key parameters to be analysed in detail through sensitivity studies
- This phase ends with a correct phenomena definition, ready to be solved by engineering methods



# Engineering solutions



SEPARATOR Output	
PROCESS CALCULATION	
VAPOR/SLUG SEPARATOR DESIGN	
Process Name	SEPARATOR
Process Unit	SEPARATOR
Process Stream	SEPARATOR
Process Type	SEPARATOR
Process Location	SEPARATOR
Process Date	SEPARATOR
Process Author	SEPARATOR
Process Designer	SEPARATOR
Process Engineer	SEPARATOR
Process Operator	SEPARATOR
Process Manager	SEPARATOR
Process Owner	SEPARATOR
Process Status	SEPARATOR
Process Version	SEPARATOR
Process Revision	SEPARATOR
Process Release	SEPARATOR
Process Approval	SEPARATOR
Process Comments	SEPARATOR
Process Notes	SEPARATOR
Process Details	SEPARATOR
Process Parameters	SEPARATOR
Process Results	SEPARATOR
Process Summary	SEPARATOR
Process Footer	SEPARATOR

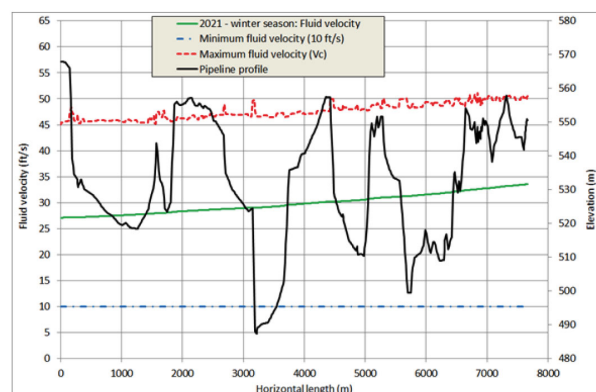
- Identified Flow Assurance issues are managed using a three step approach

  - 1) Design is performed to allow required production
  - 2) Operative Boundaries are identified for selected design
  - 3) Management procedure are defined to produce within given boundaries

- The final result of this three stage methodology is the overall definition of a production system design and management

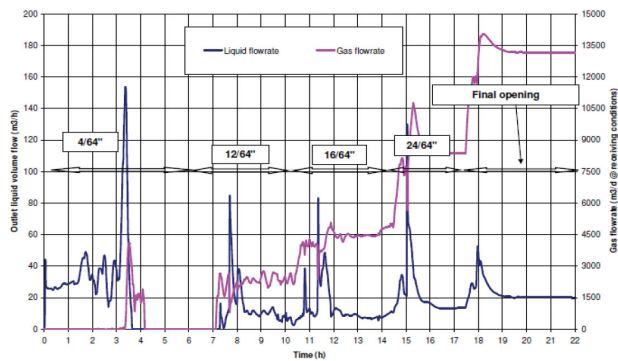
# Design

- Hydraulic and thermal design (operating envelope)
- Process component requirement (pump, separator, flare)
- Production chemistry (hydrate, wax, scale)
- Chemical Injection type, rates and volumes
- Corrosion and material selection
- Valves and controllers definition
- Umbilical network design and specifications





# Operability



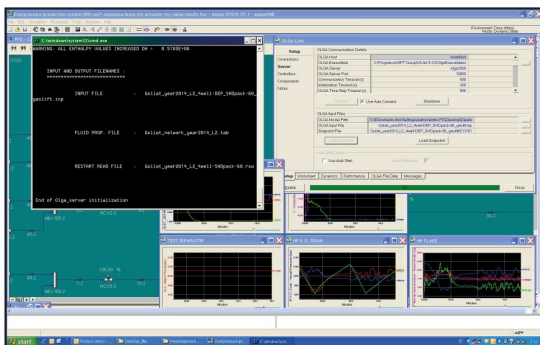
- Production shutdown and restart
- Ramp-down and ramp-up
- Pigging, flushing and hot oiling
- Blowdown and packing
- Dewatering, drying and first startup
- Procedure verification and optimization

# Management

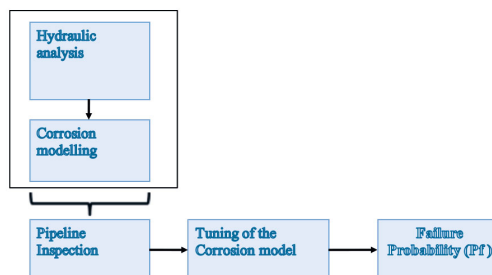
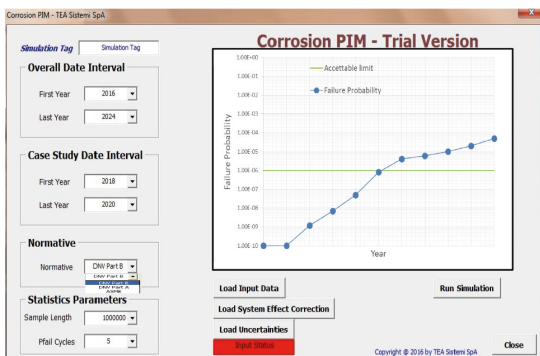
- Production Instability control philosophy
- Hydrate and Wax management strategy
- Emergency shutdown procedure
- Pipeline Integrity management

		Slugging	Hydrate	Wax
Steady State / Turndown	Prevention	Gas Lift	Insulation	Chemical Treatment
	Mitigation	Pressure	Chemical Treatment	Pigging
	Remediation	-	Depressurization	-
Unplanned Shutdown	Prevention	-	Insulation	Insulation
	Mitigation	-	Depressurization	Heating
	Remediation	-	Depressurization + Chemical Treatment	Heating
Restart	Prevention	Surge Volume	Depressurization + Pigging	Chemical Treatment
	Mitigation	Restart rate	Chemical Treatment	-
	Remediation	-	Depressurization + Chemical Treatment	-
Pigging	Prevention	Surge Volume	Depressurization + Pigging	Chemical Treatment
	Mitigation	Pig Velocity	Chemical Treatment	-
	Remediation	-	Depressurization + Chemical Treatment	-

# Special activities



- Integrated design (Flow Assurance, Process, HSE) through dynamic link (Matlab interface)
- Overpressure scenario analysis
- Blowdown network sizing/verification
- Release characterization for incidental scenarios
- Pipeline Failure Probability, Lifetime extension and requalification
- Multiphase flow modeling and software





# TEASISTEMI

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experience knowledge solutions

## CONTACTS

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