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Rockwell Automation + Schlumberger

First fully integrated **Digital Oilfield Automation** solutions provider

Sensia is a new standalone company…

The leader in digitally-enabled oil and gas integrated solutions

Sensia at a glance

Rockwell Automation

PEOPLE
~500 employees
Extensive Process Automation Engineering expertise

BUSINESS & TECHNOLOGY
Control & IoT capabilities

Oil & Gas solutions & services

Software & analytics

Artificial lift

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FOCUSED ON SOLUTIONS

~1,000 employees

HQ Location: Houston, TX

>80 countries served

Schlumberger

PEOPLE
~500 employees
Deep Petro-Technical Domain knowledge

BUSINESS & TECHNOLOGY
Measurement

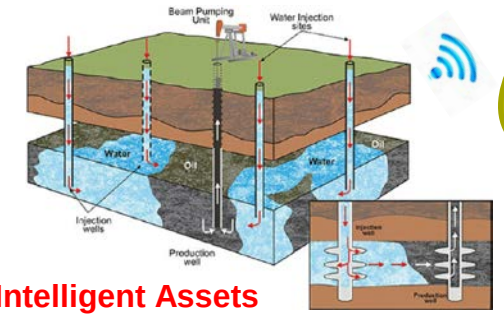
Instrumentation

Software & analytics

Artificial lift

What does it all mean?

Process Control & Safety



Intelligent Assets

Measurement, Metering & Blending

Fast Loop

Mid Loop

Slow Loop

ConnectedProduction

VFM
Aggregation
MQTT - Contextualization
Back filling
Self Diagnostics
Edge Applications
Auto Diagnostics
Predictive Analytics

LIFT IQ
AED
Instruct

Avocet

PDMS
Production Data
Well test
Production vs. Forecast
Back Allocation
Orchestration

OFM

Production & Reservoir Analytics
Forecasting
Historical Data
Interface to Petrel

Real-Time Optimisation

Intra-Day Optimisation

Daily Optimisation

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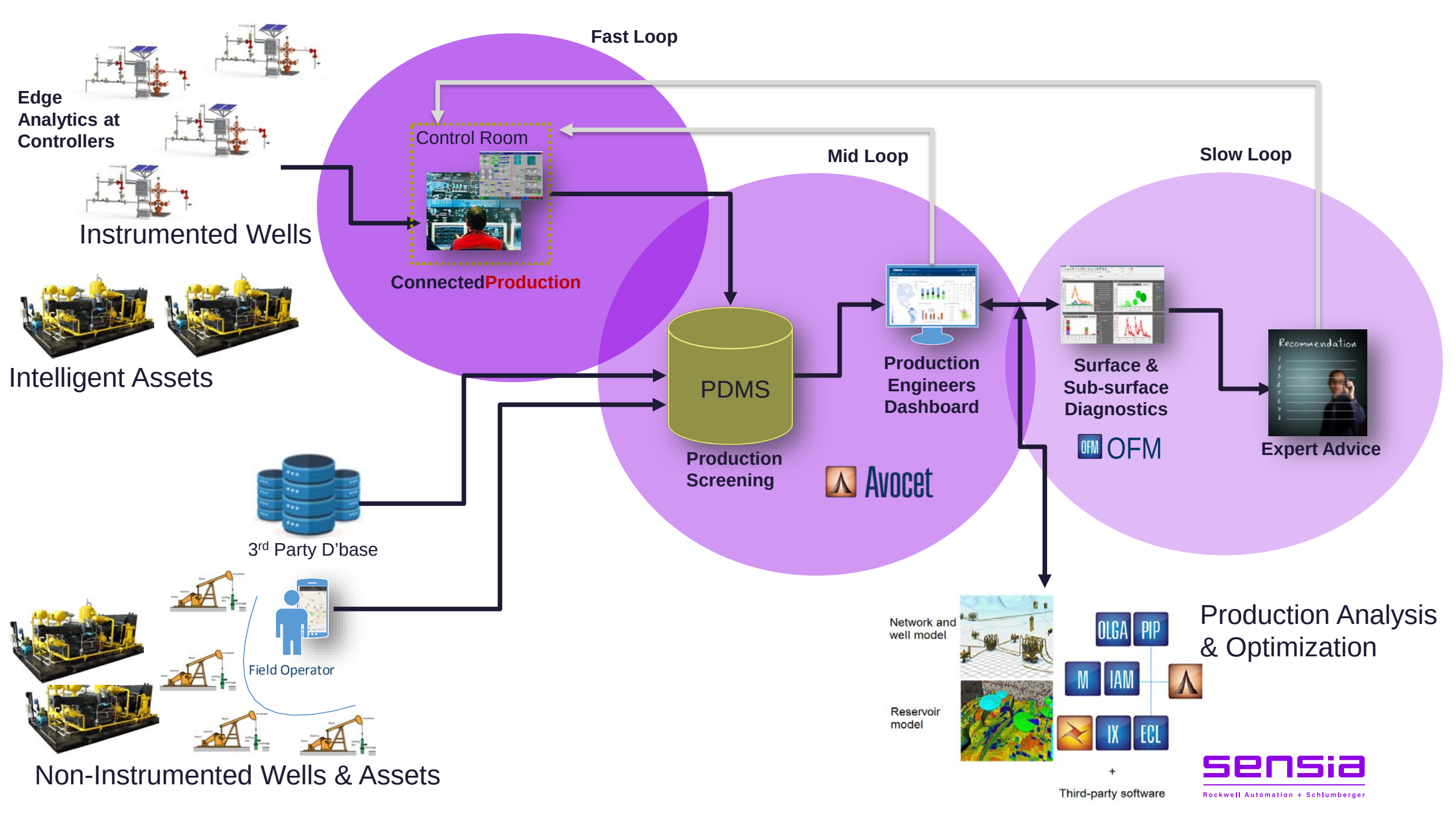
Fast Loop
Edge Analytics at Controllers
Instrumented Wells
Control Room
ConnectedProduction
Mid Loop
Slow Loop
Intelligent Assets
PDMS
Production Engineers Dashboard
Surface & Sub-surface Diagnostics
OFM
Recommendation
Expert Advice
Production Screening
Avocet
3rd Party D'base
Field Operator
Non-Instrumented Wells & Assets
Network and well model
Reservoir model
OLGA
PIP
M
IAM
IX
ECL
+
Third-party software
Production Analysis & Optimization
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Why do this? To solve customer challenges

Creating a fully integrated provider of measurement solutions, production domain expertise, and automation to the oil and gas industry.

INDUSTRY TRENDS

- Volatility
- Pressure on profit margins
- Market consolidation
- Optimize / expand capacity while minimizing capital investment

CUSTOMER NEEDS

- Faster time to market
- Operational productivity
- Asset management and reliability
- Enterprise risk management

OUTCOMES

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Complete lifecycle and process automation solutions from well to terminal

Measurement and data connectivity for insight & analytics

Artificial Lift – optimization and life extension of oil wells

Integrated process automation

Digital solutions for efficient management of Oil and Gas Assets

The value and where you'll find it

From reservoir to refinery, Sensia provides solutions for:

- Production
- Transportation and storage
- Processing

It helps reduce risk, drive efficiency, optimize performance:

- Optimize project execution
- Improve operational certainty
- Increase reliability and uptime
- Optimize asset utilization
- Improve safety
- Increase output
- Extend life

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Bring the Gas Lift Operations to the Digital Era !

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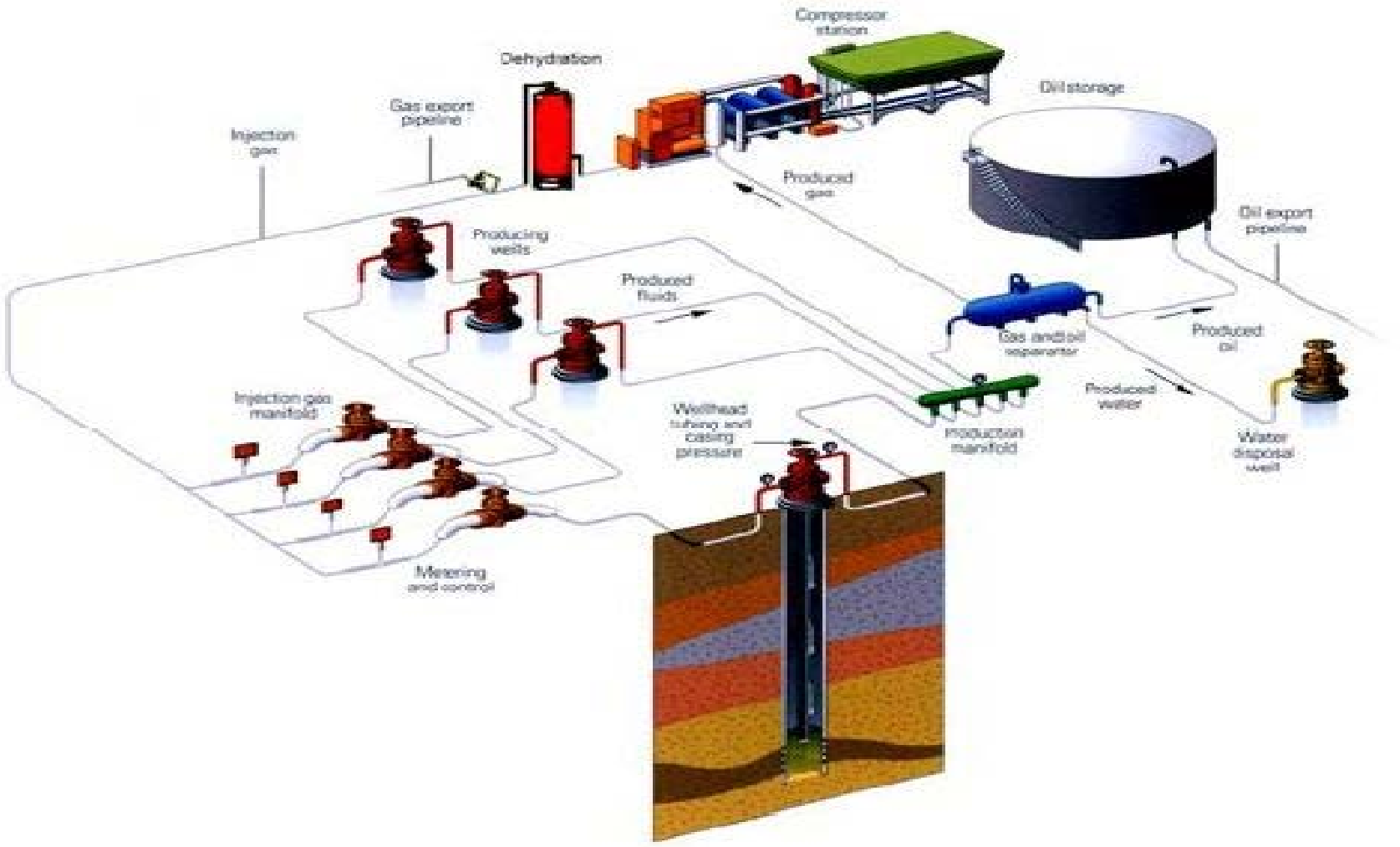
Simplified Gas Lift Network



Objective:

- Optimise and Automate the quantity of gas that is injected.
- Take advantage of Technology:
  - Right Quantity of Gas
  - In the right Well
  - In the right Time
  - Depending on operating conditions

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Integrated Gas Lift Automation and Optimization Solution

Update Pipesim
Model & execute
Optimization workflow

PIP PIPESIM
STEADY-STATE MULTIPHASE FLOW SIMULATOR

MODEL & Work Flow O/P

Gas Injection
Control Valve

Manual Solution

- Typically this may have been completed Manually
  - Continuous Injection via manually operated valve
  - Intermittent injection via regulator
  - Collect the Model from Packages (PIPESIM/PETEX)
  - Delivery Manually to Engineer in Field
  - Engineer in Field will setup the injection point.

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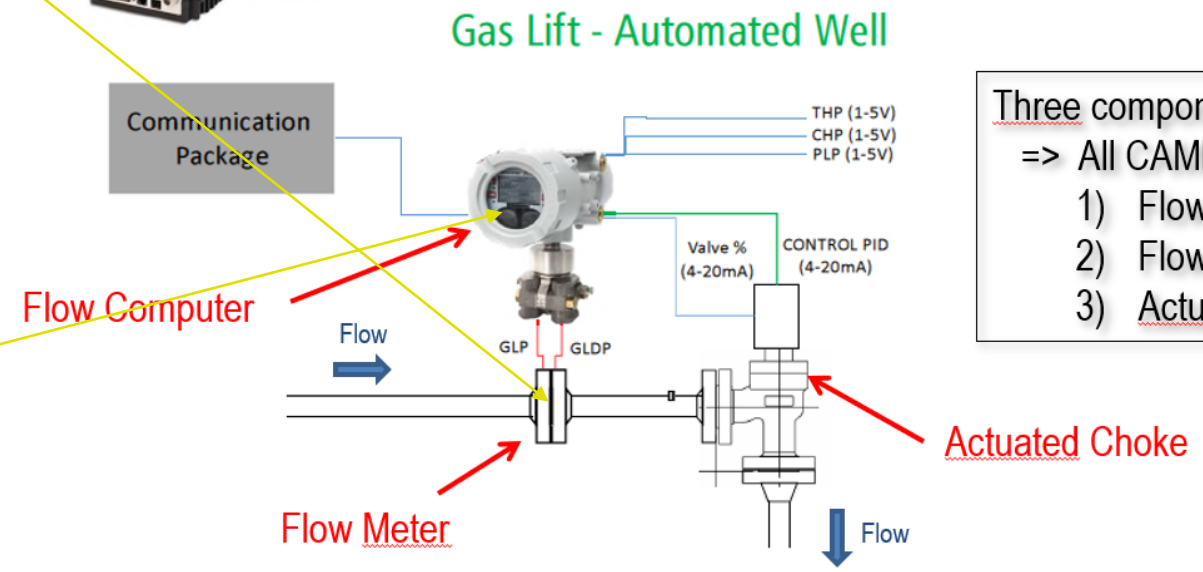
+ Sensia Measurement Solution

CAM20-MT / CAM30-MT
Multi-Trim Chokes



Three components
=> All CAMERON:
1) Flow Computer
2) Flow Meter
3) Actuated Choke

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Integrated Gas Lift Automation and Optimization Solution

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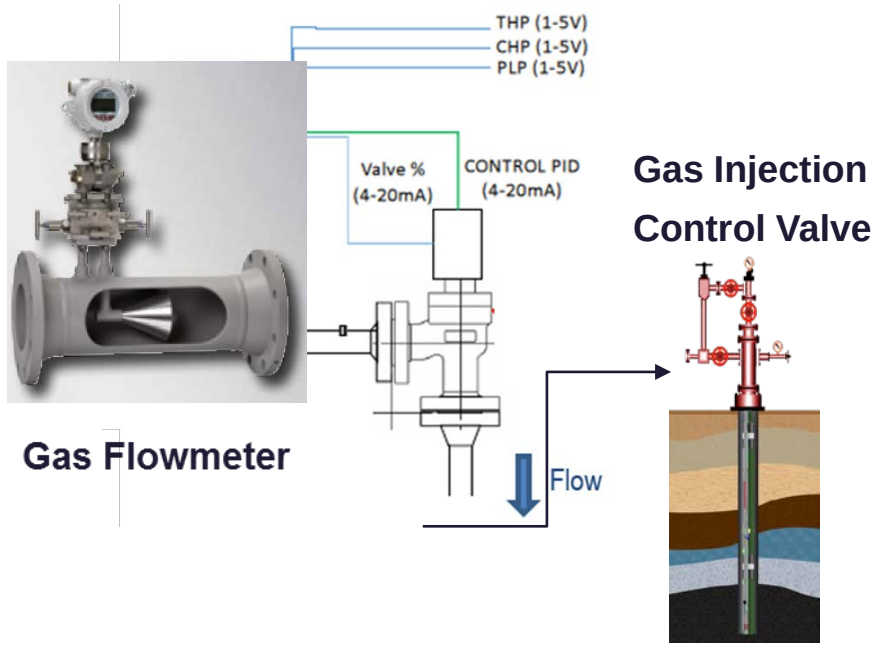
Optimization workflow

MODEL & Work Flow O/P

PIPESIM
STEADY-STATE MULTIPHASE FLOW SIMULATOR

Output to AVOCET



Gas Flowmeter

Gas Injection Control Valve

Instrumentation:

- Well Head or the Injecting Manifold
- Cone Meter
  - Measures Gas Flow into the Well (differential pressures)
- Multivariable / Flow Computer Transmitter
  - Compares & corrects current Injection Rates
  - Automatically corrects the Gas injection based on set points
  - Measure Temperature and Pressure

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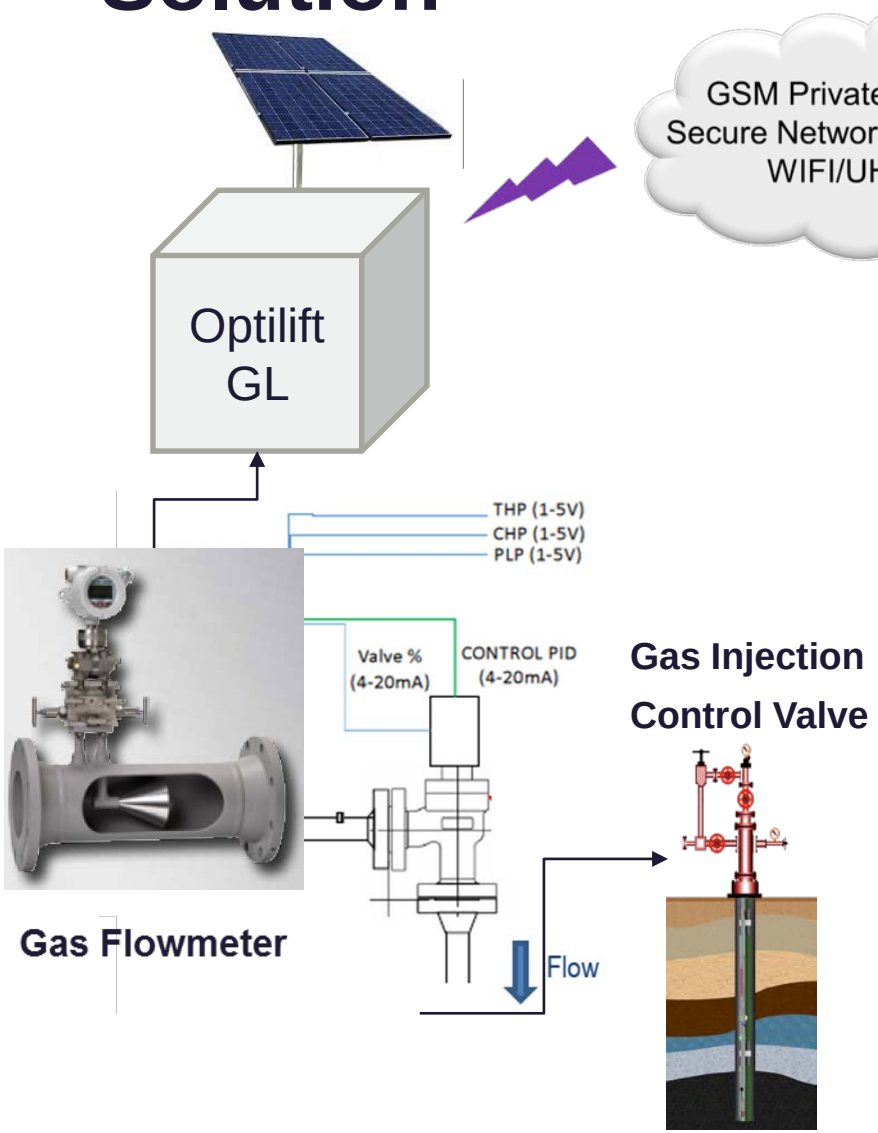
Integrated Gas Lift Automation and Optimization Solution



Update Pipesim
Model & execute
Optimization workflow

MODEL & Work Flow O/P

PIP PIPESIM
STEADY-STATE MULTIPHASE FLOW SIMULATOR

Output to AVOCET

Optlifit GL - RTU and Application Software Solution

- RTU & Telemetry Solution
- Real Time / In Context Data from field to modelling solution
- Automated modelling – systemic or exception based
- Download the Modelling set points to Controller
- Controller connect to Flow Computer
- Maintain Cyclic Control of Gas Injection

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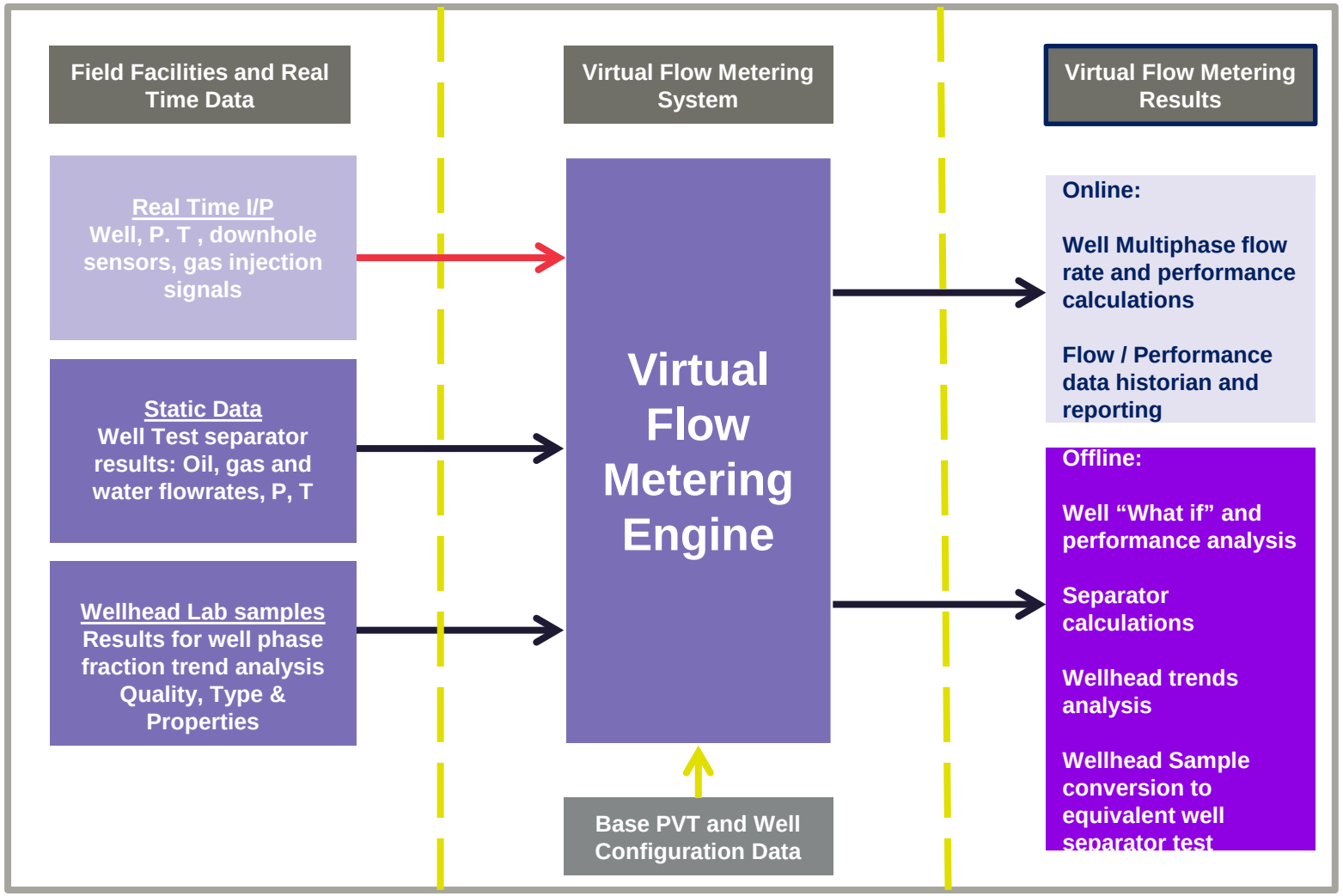
+ VFM



- Real Time Feedback
- Computes oil, gas and water flow rates
- Model Validation
- Model Deviation
- Water Breakthrough
- Gas Circulation
- Low Flow
- Reduced Well Test

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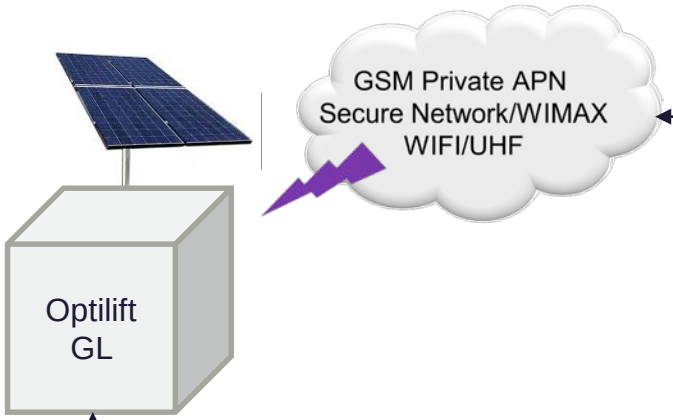
Integrated Gas Lift Automation and Optimization Solution



Unified DOF Platform

High Frequency

PDMS & Workflow

Update Pipesim

Model & execute

Optimization workflow

PIPESIM
STEADY-STATE MULTIPHASE FLOW SIMULATOR

Output to AVOCET

THP (1-5V)
CHP (1-5V)
PLP (1-5V)

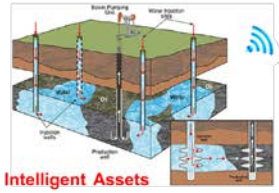
Valve %
(4-20mA)

CONTROL PID
(4-20mA)

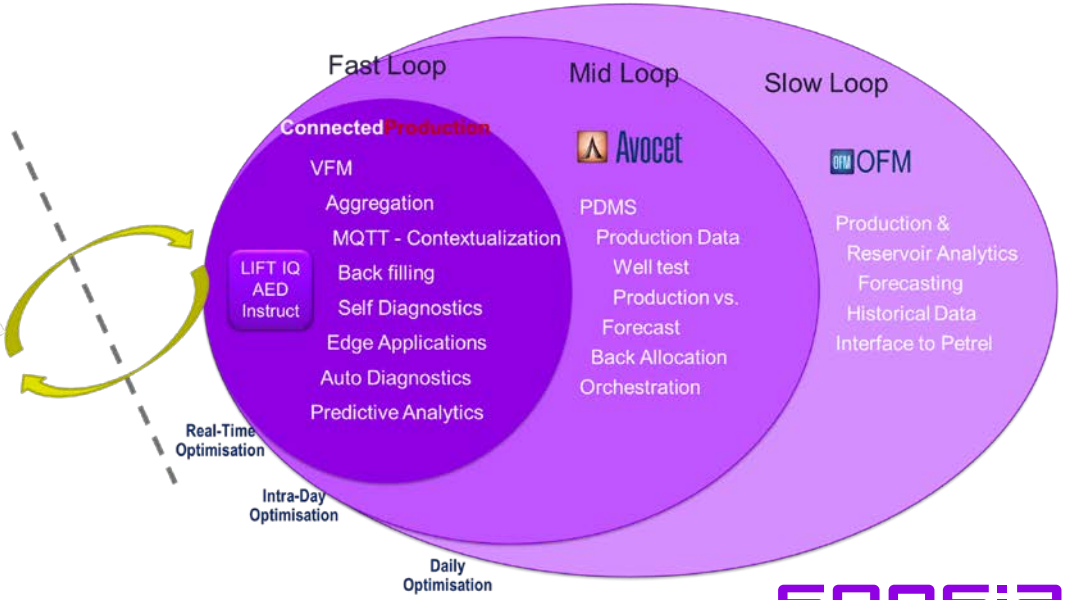
Flow

Gas Flowmeter

Gas Injection Control Valve



- 44 Existing Sensia
- 77 GOFSCO
- 80 New



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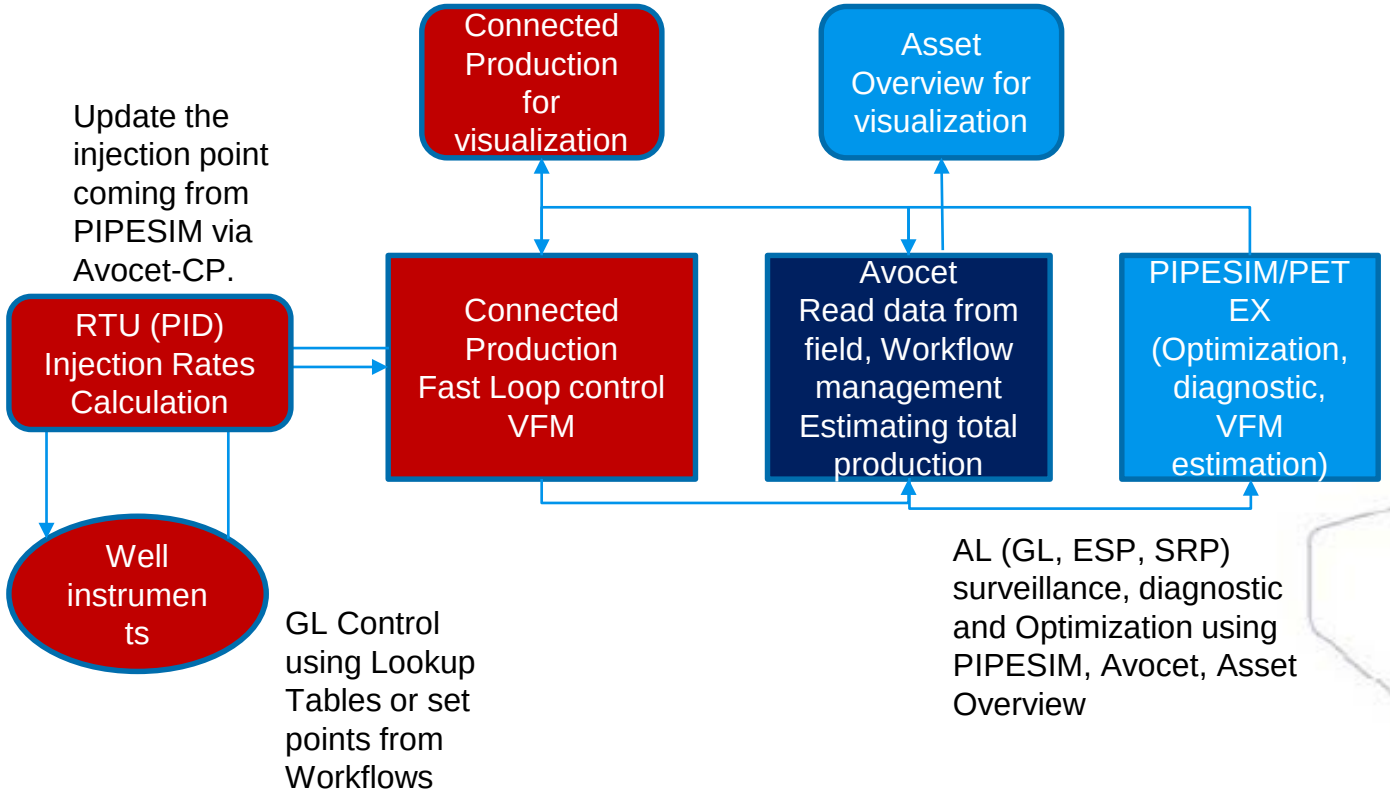
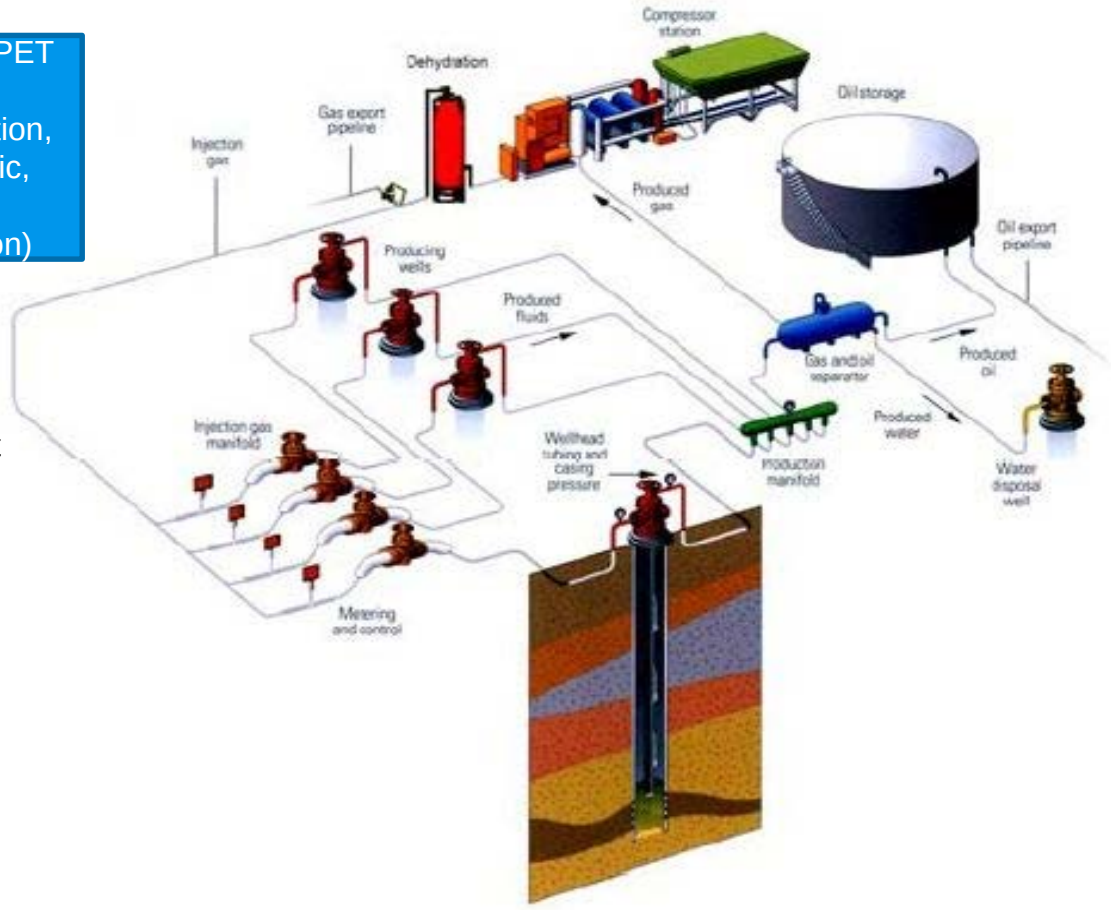
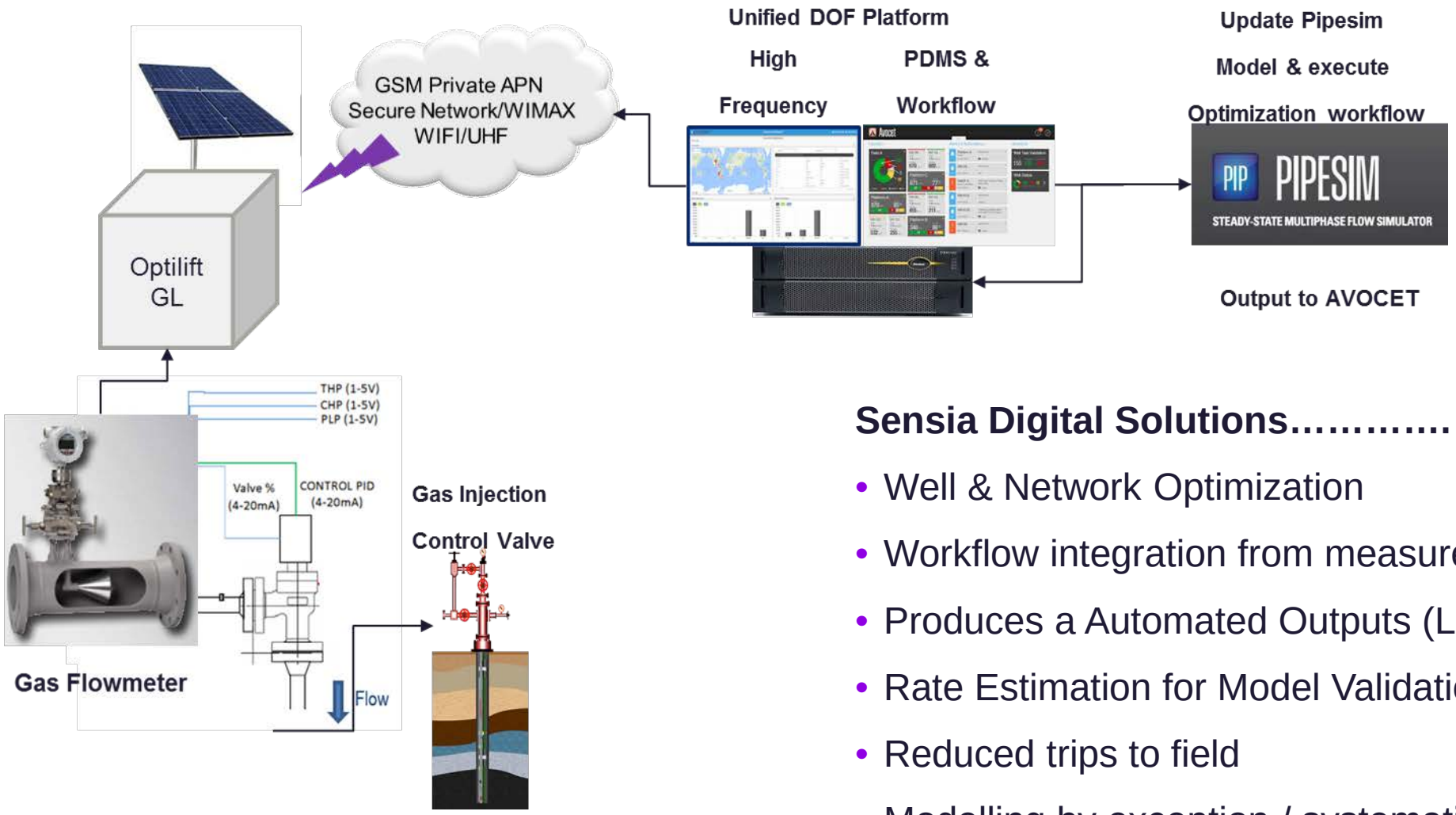
+ Optimisation the injection rate at Well Heads / Network





+ Summary



Sensia Digital Solutions……

- Well & Network Optimization
- Workflow integration from measurement & model
- Produces a Automated Outputs (Linking PIPESIM to Optilift)
- Rate Estimation for Model Validation
- Reduced trips to field
- Modelling by exception / systematic
- Increased productivity

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Thank You

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