CEPSA corporate PDMS - From data capturing to production optimization

Gustavo Moreira Marcano
Production Engineer
CEPSA E&P

What's Next?
SIS Global Forum 2017
September 13–15
Le Palais des Congrès de Paris

Schlumberger


CEPSA

AGENDA

- ❑ BACKGROUND
  - CEPSA IN THE WORLD
  - IT INFRASTRUCTURE
- ❑ OBJECTIVES
- ❑ DEPLOYMENT
  - DATA CAPTURING-PROCESSING WORKFLOW
- ❑ TOWARDS PRODUCTION OPTIMIZATION
- ❑ CONCLUSIONS
- ❑ QUESTIONS

MUBADALA

The Company

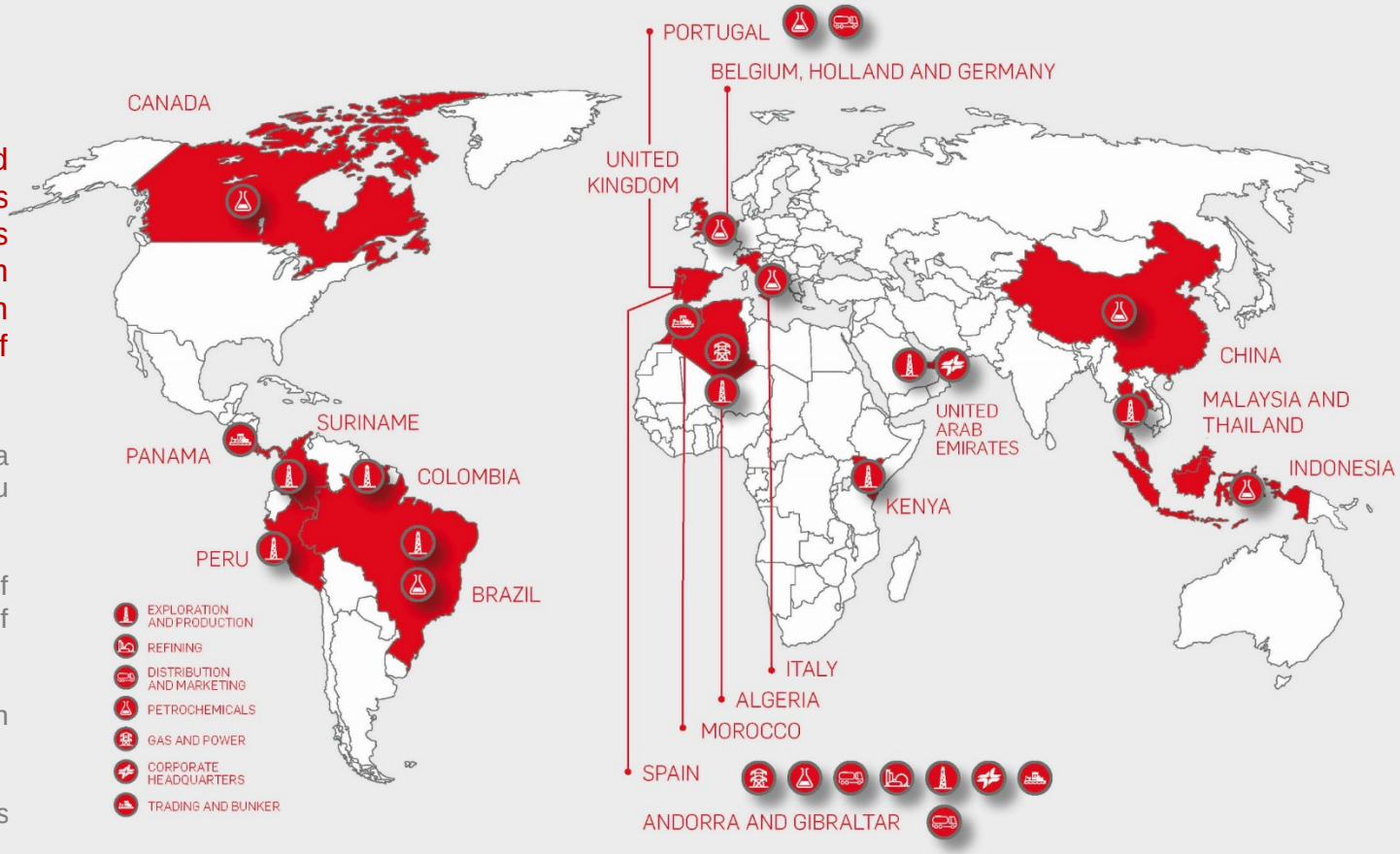
We are an integrated company operating across the entire oil and gas production chain from exploration and production to distribution and sale of final products.

1.- Being part of Mubadala Investment Company an Abu Dhabi sovereign wealth fund.

2. With more than 80 years of experience in the world of petroleum.

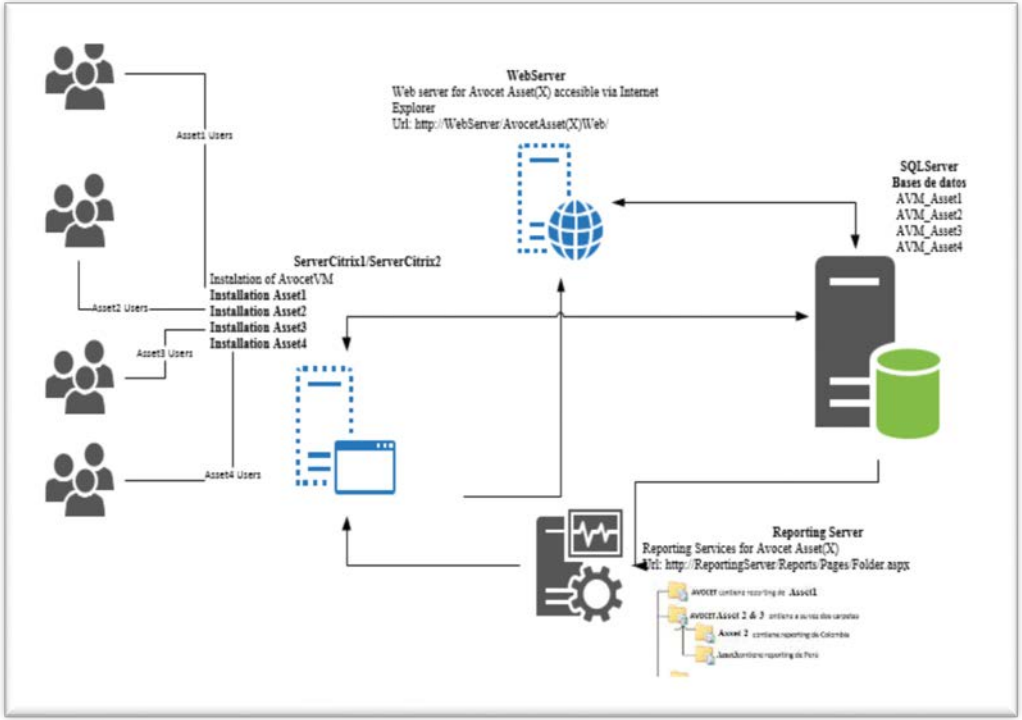
3. With a team of more than 10,000 professionals.

4. Developing its activity across six business areas



BACKGROUND - CEPSA New IT Infrastructure

- Standardization and centralization of all workflow data system
- Globalization of technical support
- Allowing full integration from different sources
- Citrix environment



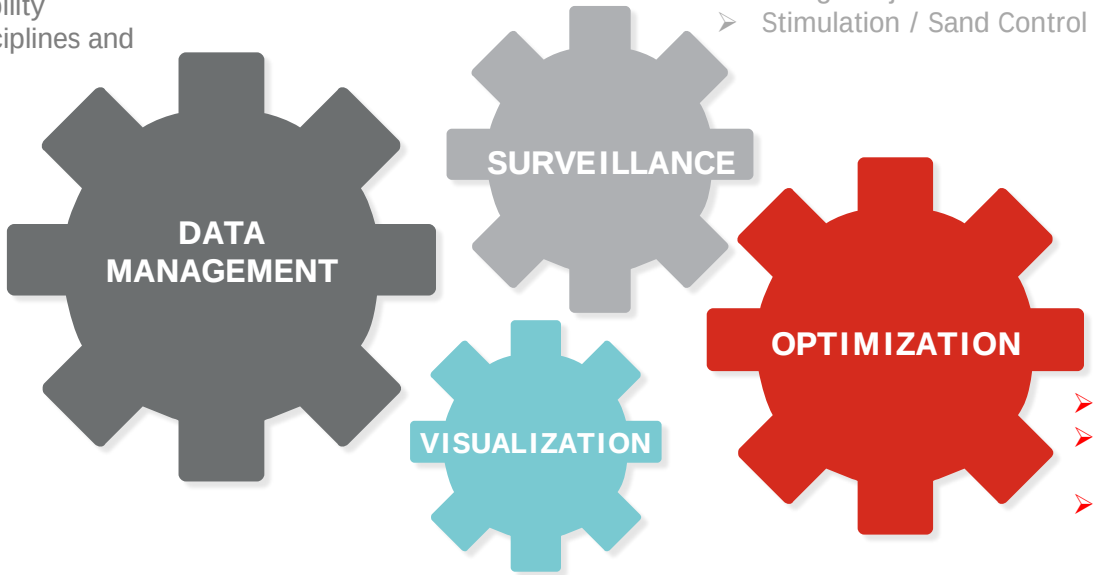
AGENDA

- BACKGROUND
  - CEPSA IN THE WORLD
  - IT INFRAESTRUCTURE
- OBJECTIVES
- DEPLOYMENT
  - DATA CAPTURING-PROCESSING WORKFLOW
- TOWARDS PRODUCTION OPTIMIZATION
- CONCLUSIONS
- QUESTIONS

OBJECTIVES – PDMS

- Monitoring data capture and QA/QC
- Data Storage and accessibility
- Integration with other disciplines and applications

- Permanent well /Artificial Lift monitoring modeling and efficiency
- Permanent monitoring such as water injection and gas injection
- Stimulation / Sand Control



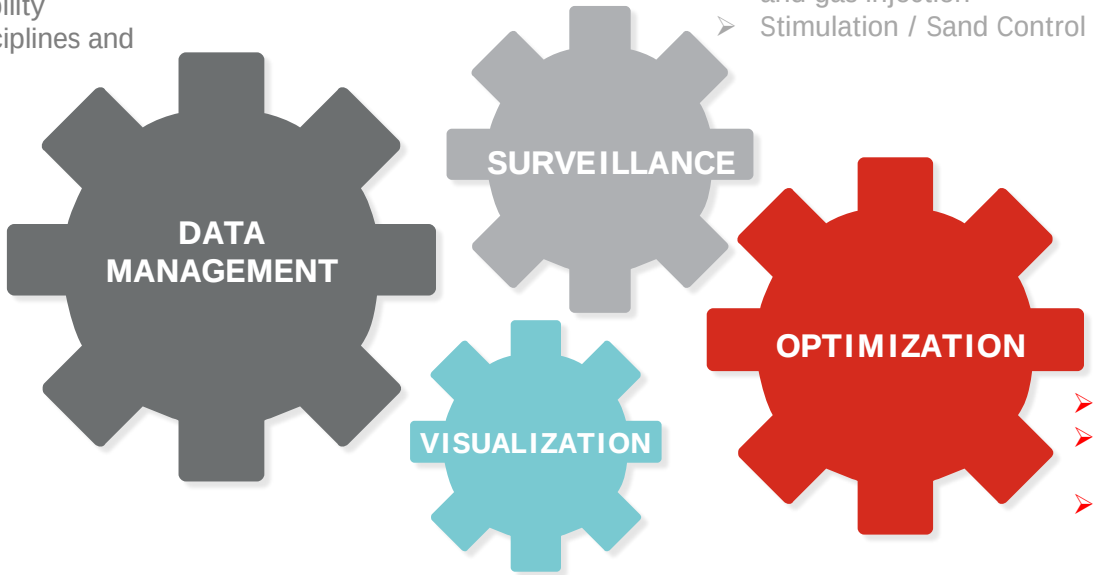
- Production
- Reporting (Trends analysis, KPI´s)
- Subsurface and facilities

- Integrated Asset Management
- Upstream and Downstream bottleneck issue
- Field development planning, production forecasting and simulations based on reliable data

OBJECTIVES – PDMS

- Monitoring data capture and QA/QC
- Data Storage and accessibility
- Integration with other disciplines and applications

- Permanent well /Artificial Lift monitoring modeling and efficiency
- Permanent monitoring such as water injection and gas injection
- Stimulation / Sand Control



- Production
- Reporting (Trends analysis, KPI´s)
- Subsurface and facilities

- Integrated Asset Management
- Upstream and Downstream bottleneck issue
- Field development planning, production forecasting and simulations based on reliable data

AGENDA

- ❑ BACKGROUND
  - CEPSA IN THE WORLD
  - IT INFRAESTRUCTURE
- ❑ OBJECTIVES
- ❑ DEPLOYMENT
  - DATA CAPTURING-PROCESSING WORKFLOW
- ❑ TOWARDS PRODUCTION OPTIMIZATION
- ❑ CONCLUSIONS
- ❑ QUESTIONS

SCHEDULE deployment

Kick-Off Meeting

Begins Deployment Avocet Solution

Historical Migration

Deployment Completed

Feb-Apr 2015

May 2015

Jul 2015

Aug 2015

Sep 2015

Dec 2015

Jan-Mar 2016

Jun 2016

Decision Space HALLIBURTON Landmark

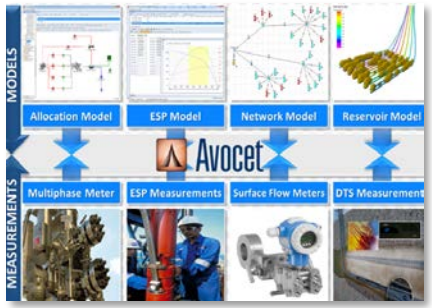
Avocet Schlumberger

Production Manager MERRICK

Energy Components tieto

Definitions and Review Specifications Asset by Asset

Setup, Data Capture, Allocation – ALL ASSETS



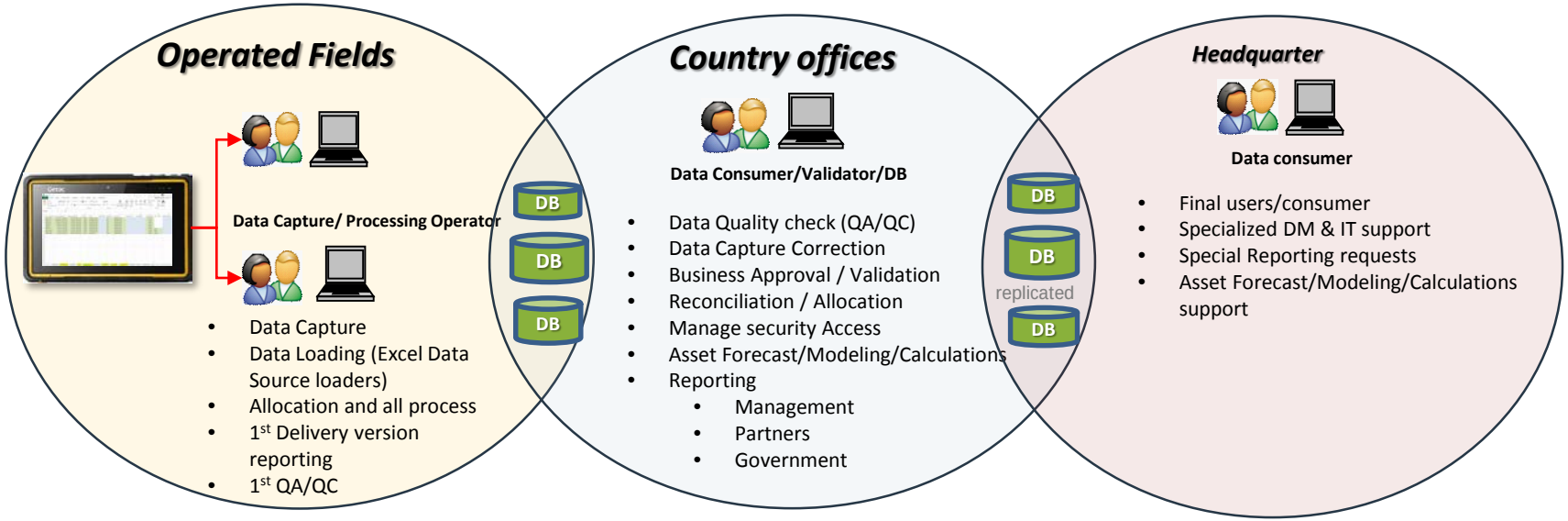
TRAINING & COACHING + PARALLEL RUN

AVOCET

Old System

GO LIVE

DATA CAPTURING – Processing Workflow



DATA CAPTURING – Processing

Old version

Headquarter

- Standard Tool manager across all assets
- Central Reporting tool manager
- Central administration/Maintenance support
- Easy/Secure Access to Production Data
- Leverage License usage

Administrator

PDMS

Data consumer

Data consumer

OFM / PETEX Integration

Data consumer

Operated Fields

Data Capture/ Processing Operator

- Data Capture
- Bulk Data Loading (Excel Data Source loaders)
- Allocation and all process
- 1st Delivery version reporting
- 1st QA/QC

If necessary

Country offices

Data Consumer/Validator

- Data Quality check (QA/QC)
- Data Capture Correction
- Business Approval / Validation
- Reconciliation / Allocation
- Manage security access
- Reporting
  - Management
  - Partners
  - Government

AGENDA

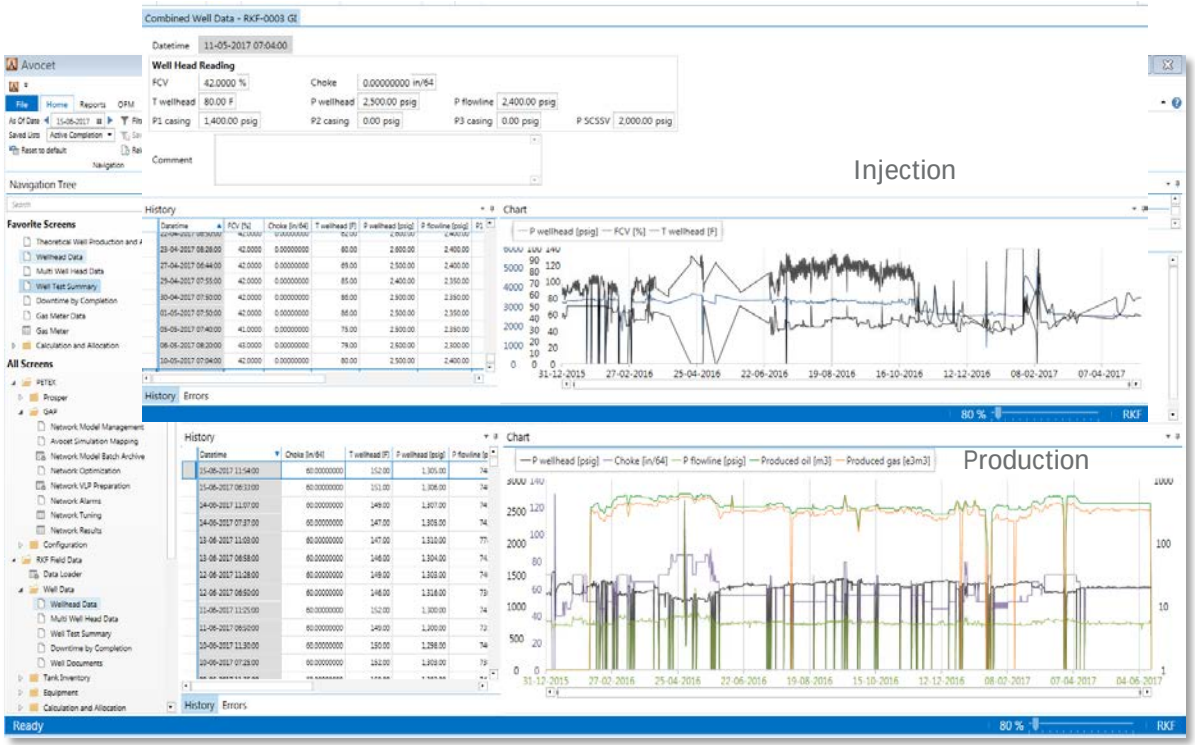
- BACKGROUND
  - CEPSA IN THE WORLD
  - IT INFRAESTRUCTURE
- OBJECTIVES
- DEPLOYMENT
  - DATA CAPTURING-PROCESSING WORKFLOW
- TOWARDS PRODUCTION OPTIMIZATION
- CONCLUSIONS
- QUESTIONS

TOWARDS THE PRODUCTION OPTIMIZATION - Improvements

- DATA MANAGEMENT - SURVEILLANCE
  - Data QA/QC
  - Permanent Production – Injection monitoring
  - Artificial Lift Systems
- VISUALIZATION
  - Management on production downtime and losses
  - Reporting
    - *Internal*
    - *Partners/Governments*
- ASSET OPTIMIZATION
  - PETEX Integration
  - Digital Oil Field vision

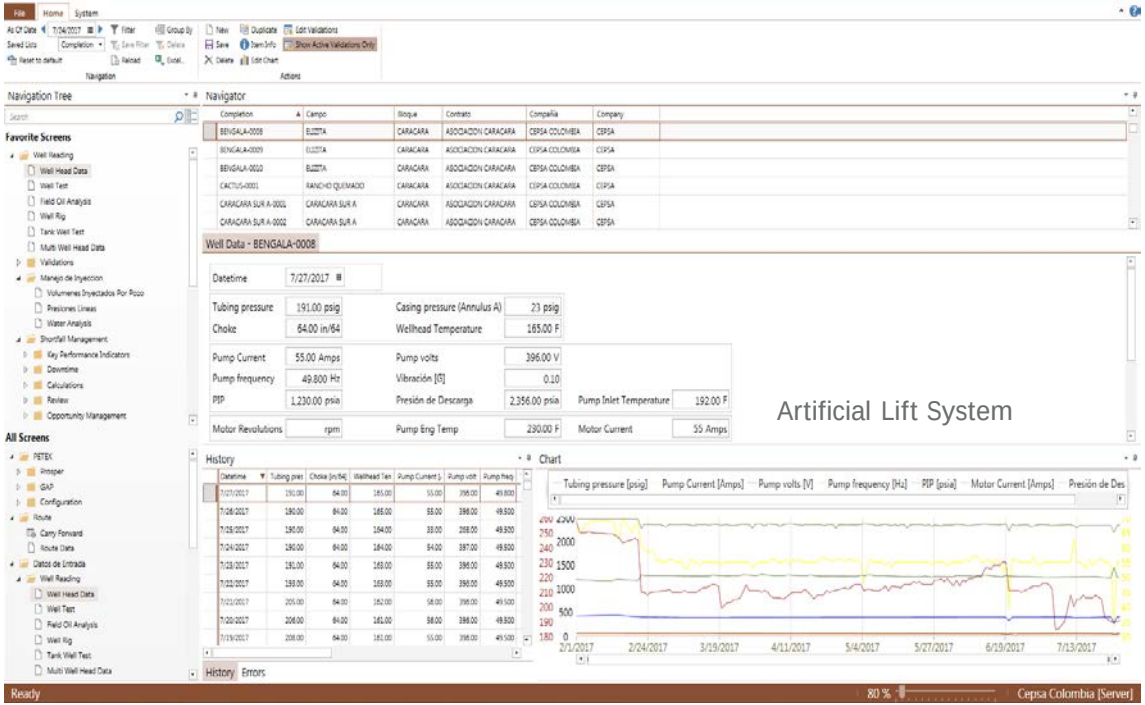
DATA MANAGEMENT - SURVEILLANCE

- Permanent graphical monitoring
  Production – Injection



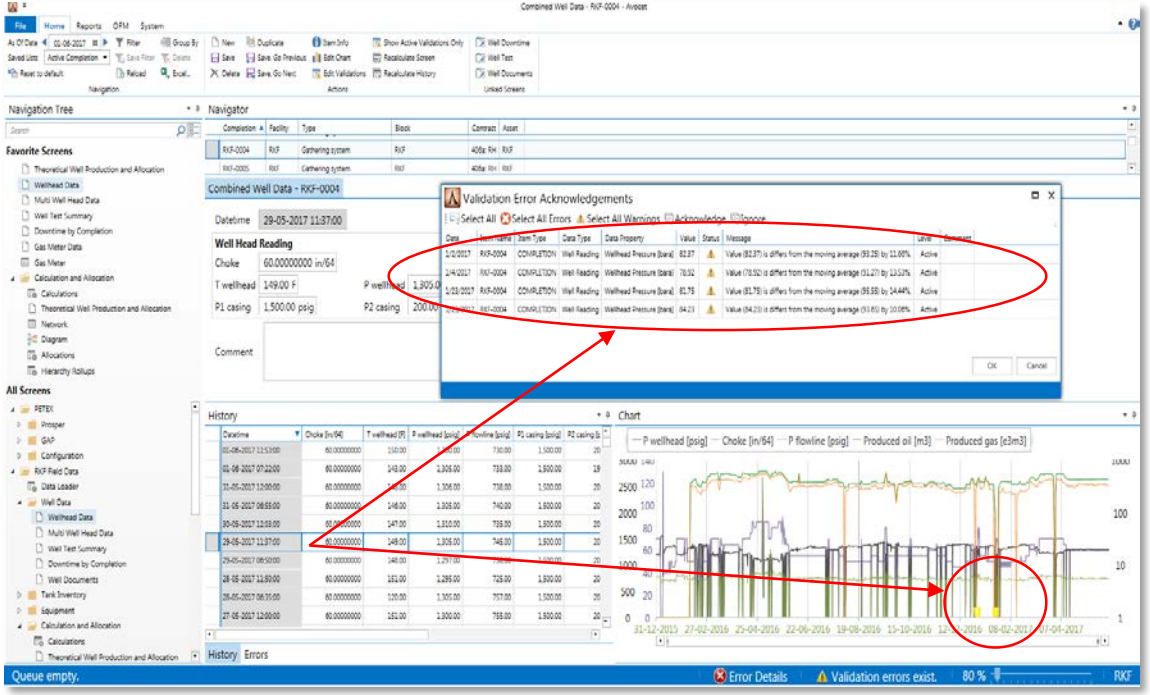
DATA MANAGEMENT - SURVEILLANCE

- Permanent graphical monitoring Production – Injection
- Troubleshooting and monitoring artificial lift systems behaviors



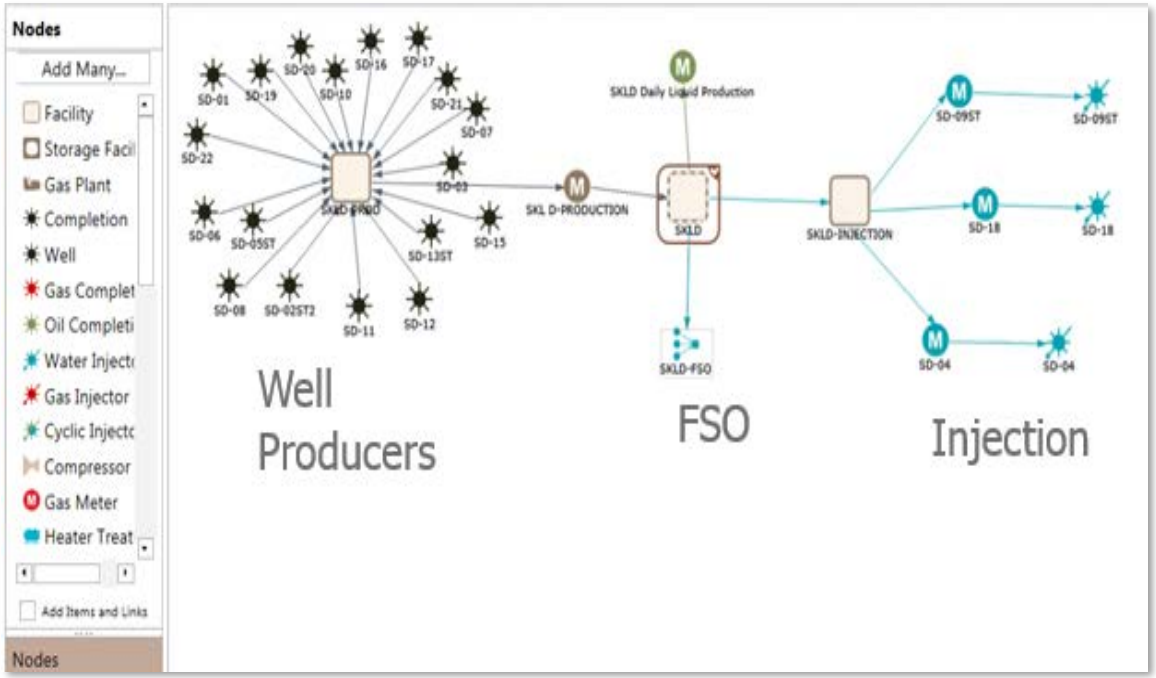
DATA MANAGEMENT - SURVEILLANCE

- Permanent graphical monitoring Production – Injection
- Troubleshooting and monitoring artificial systems behaviors
- Appointed rule for QA/QC for data validations and verifications



DATA MANAGEMENT - SURVEILLANCE

- Permanent graphical monitoring Production – Injection
- Troubleshooting and monitoring artificial systems behaviors
- Appointed rule for QA/QC for data validations and verifications
- Subsurface and surface production and equipment behaviours

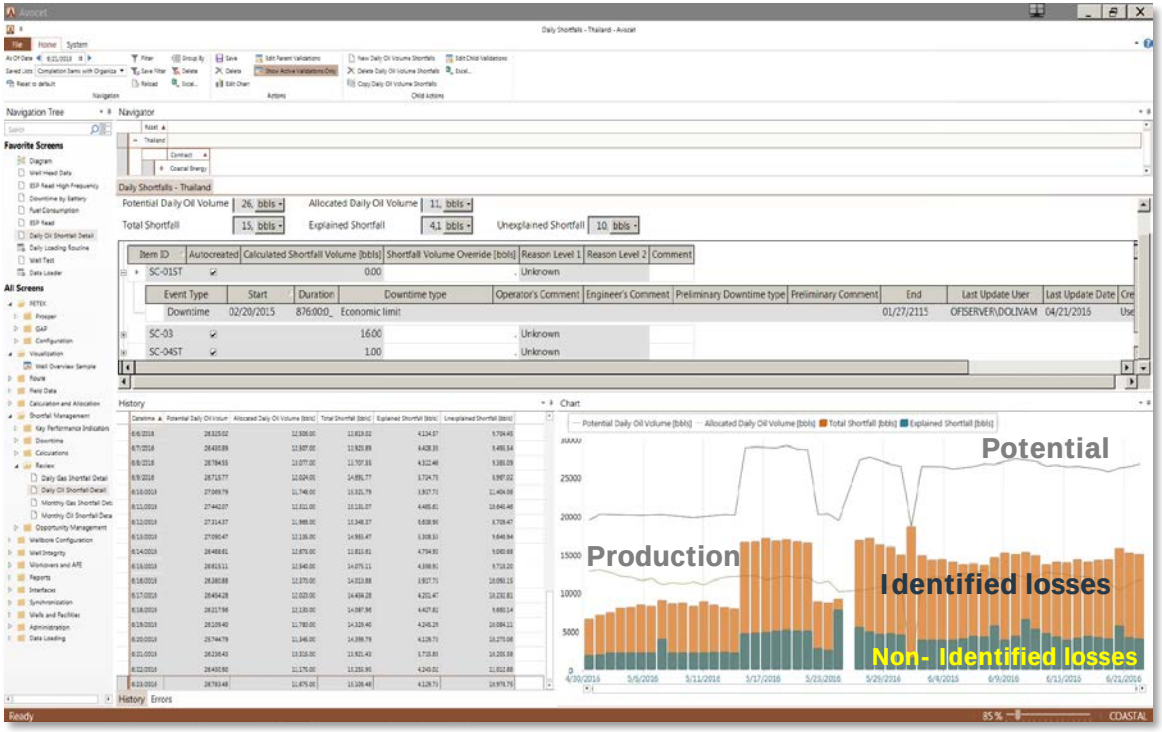


TOWARDS THE PRODUCTION OPTIMIZATION - Improvements

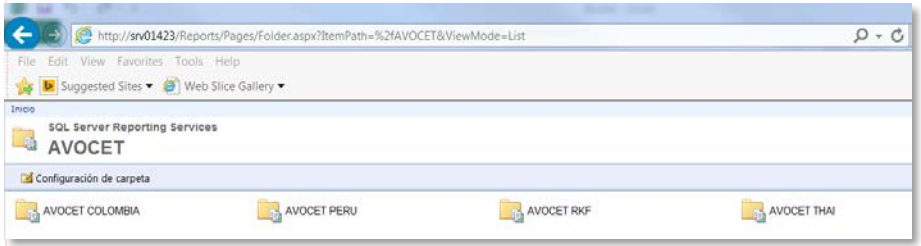
- DATA MANAGEMENT - SURVEILLANCE
  - Data QA/QC
  - Permanent Production – Injection monitoring
  - Artificial Lift Systems
- VISUALIZATION
  - Management on production downtime and losses
  - Reporting
    - *Internal*
    - *Partners/Governments*
- ASSET OPTIMIZATION
  - PETEX Integration
  - Digital Oil Field vision

VISUALIZATION - SURVEILLANCE

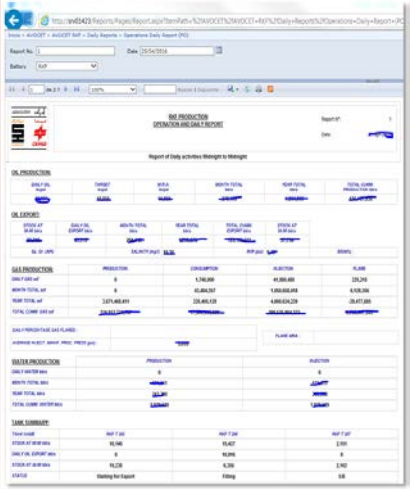
- Production losses/downtime standardization
- Comparison between identified losses, non-identified, oil potential and real production in real time

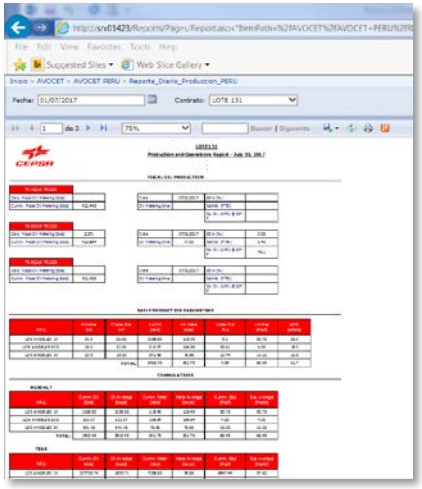


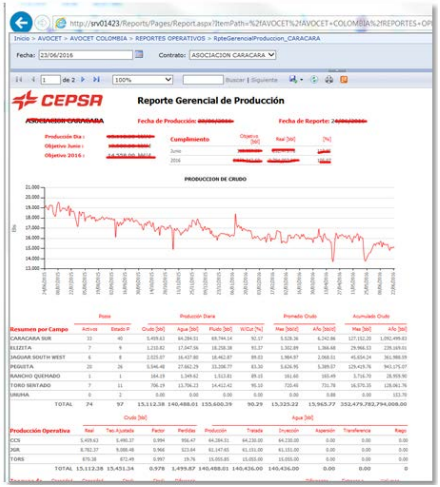
CORPORATE REPORTING – Visualization vía web

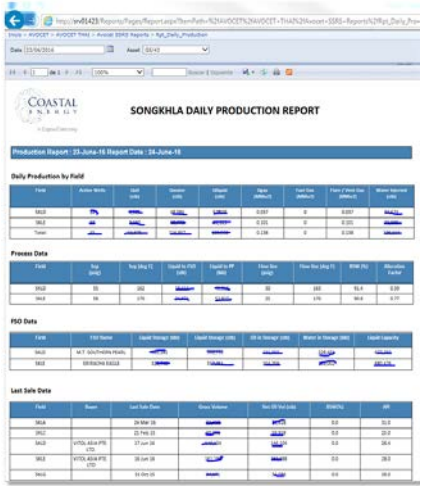


- Centralized reporting tool accessibility via Web. For internal corporates reports (KPIs and Dashboards)
- All levels data available, for technical and top management

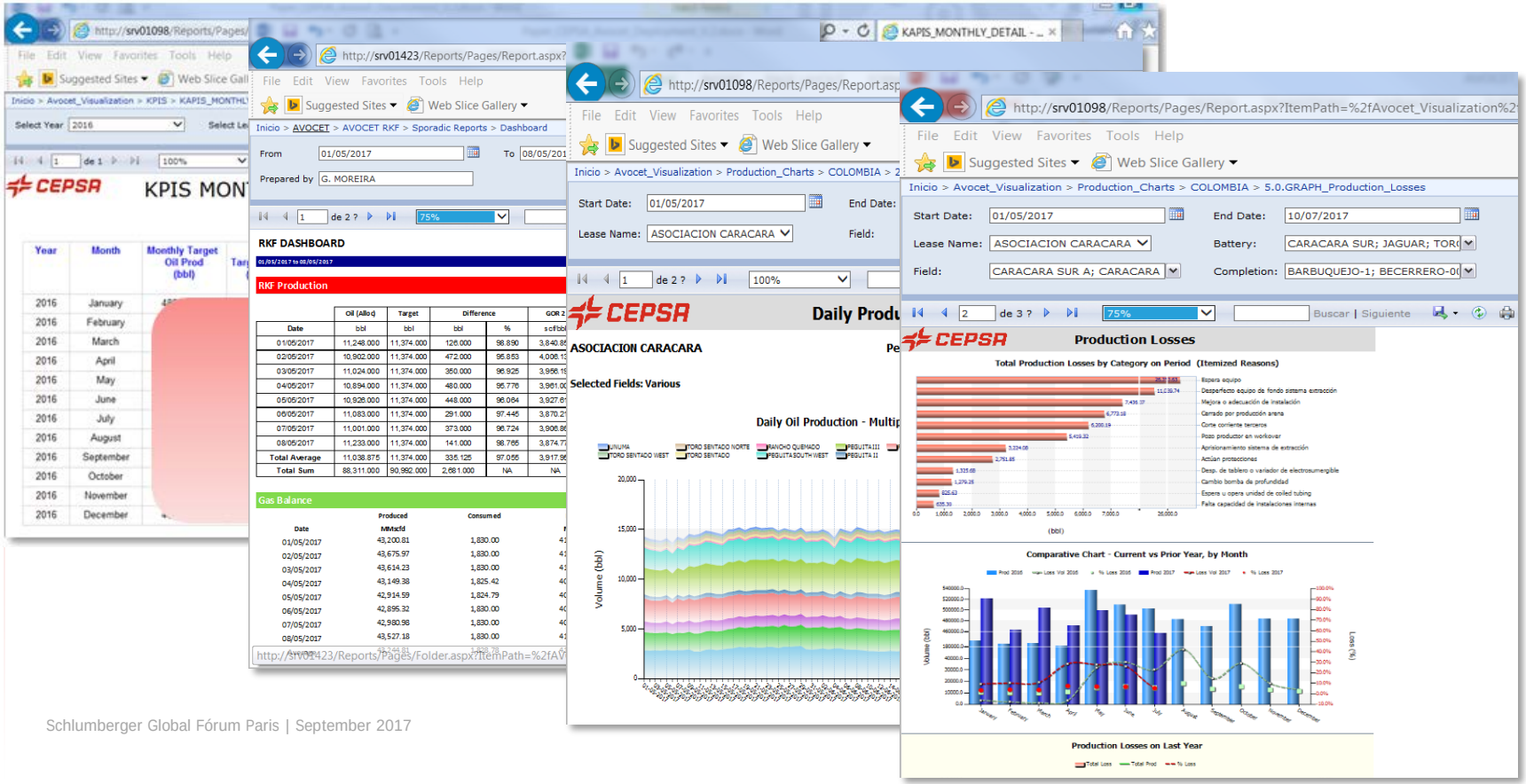








INTERNAL REPORTING – Visualization vía web

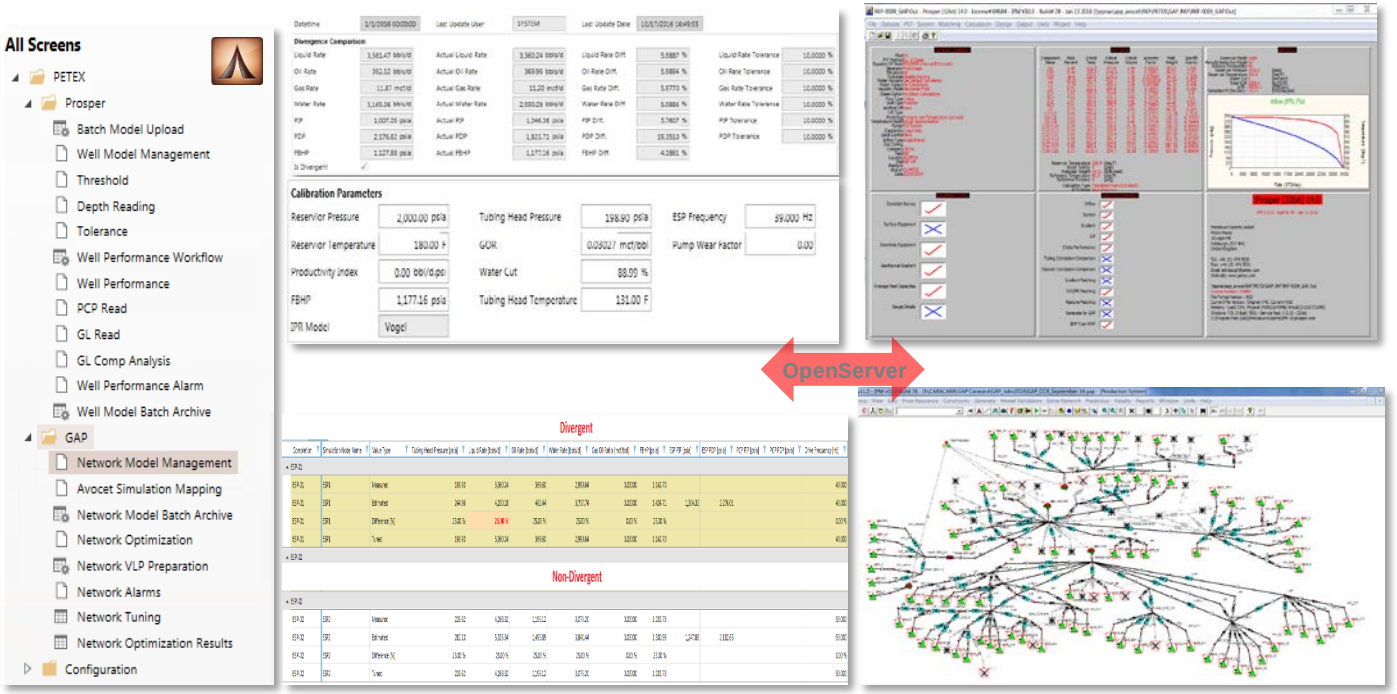


TOWARDS THE PRODUCTION OPTIMIZATION - Improvements

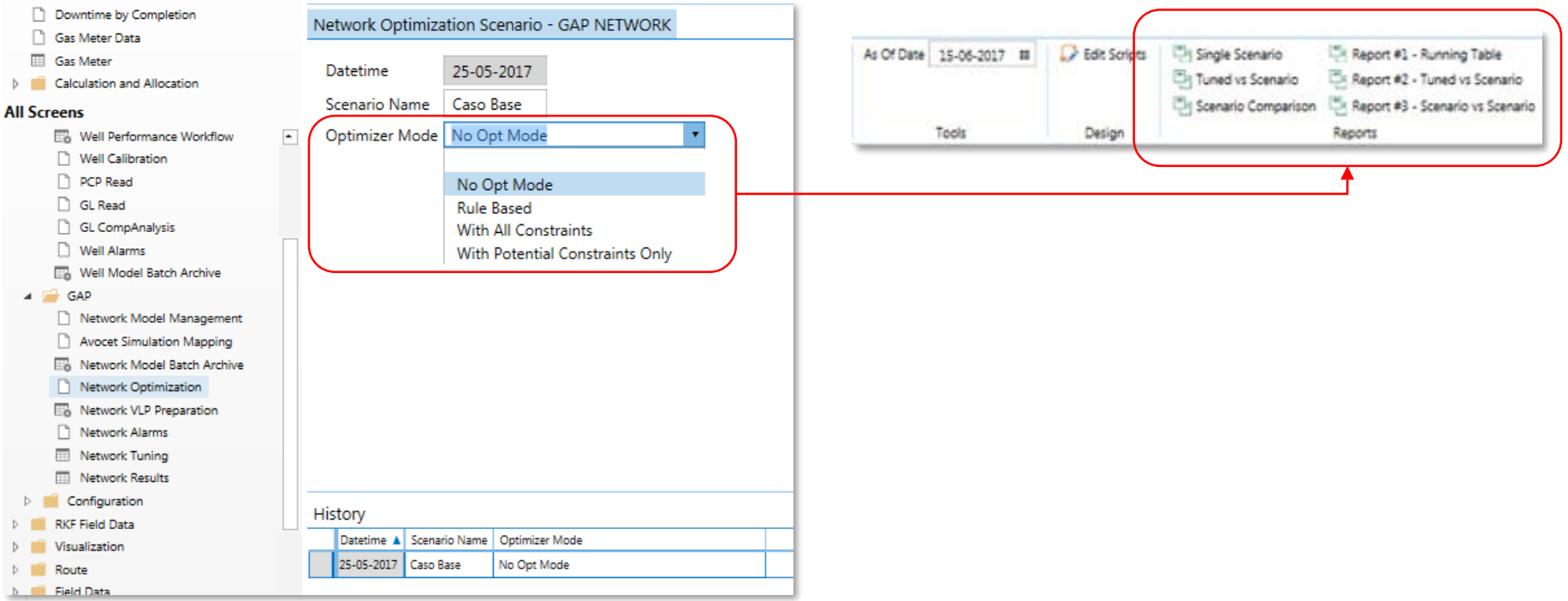
- DATA MANAGEMENT - SURVEILLANCE
  - Data Capture -> Database
  - Data QA/QC
  - Permanent Production – Injection monitoring
- VISUALIZATION
  - Management on production downtime and losses
  - Reporting
    - *Internal*
    - *Partners/Governments*
- ASSET OPTIMIZATION
  - PETEX Integration
  - Digital Oil Field vision

PETEX INTEGRATION - Processing

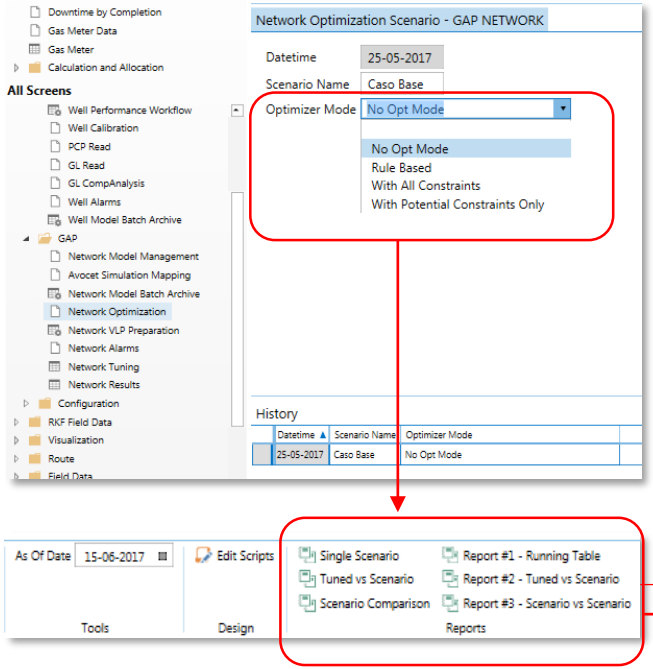
- Standard workflows for all units
- Workflows accessible from all assets using Avocet (in-situ) with real data up to date
- Permanent collaboration from Headquarter



PETEX INTEGRATION – Results/Optimization



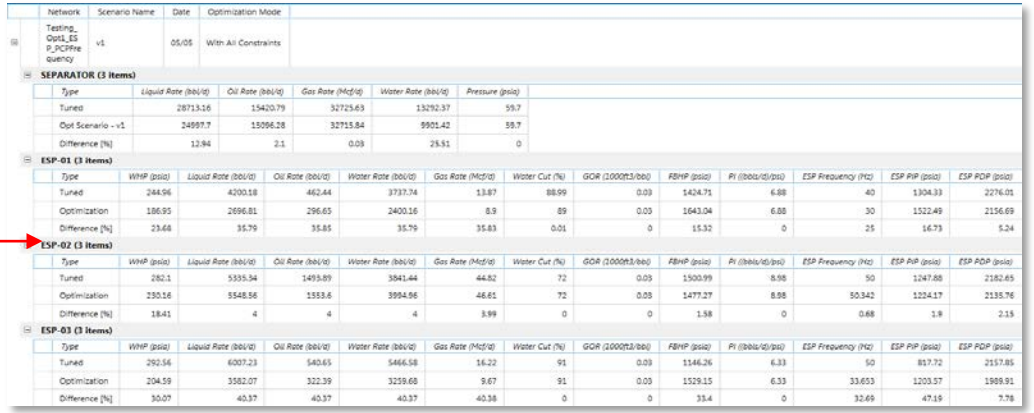
PETEX INTEGRATION – Results/Optimization



Network	Scenario	Optimization Mode
Testing_Opt1_ESP_PCPFrequency	v1	With All Constraints

Scenario Name	Separator	Liquid Rate (bbl/d)	Oil Rate (bbl/d)	Gas Rate (Mcf/d)	Water Rate (bbl/d)	Pressure (psia)
v1	SEPARATOR	24997.7	15096.28	32715.84	9901.42	59.7

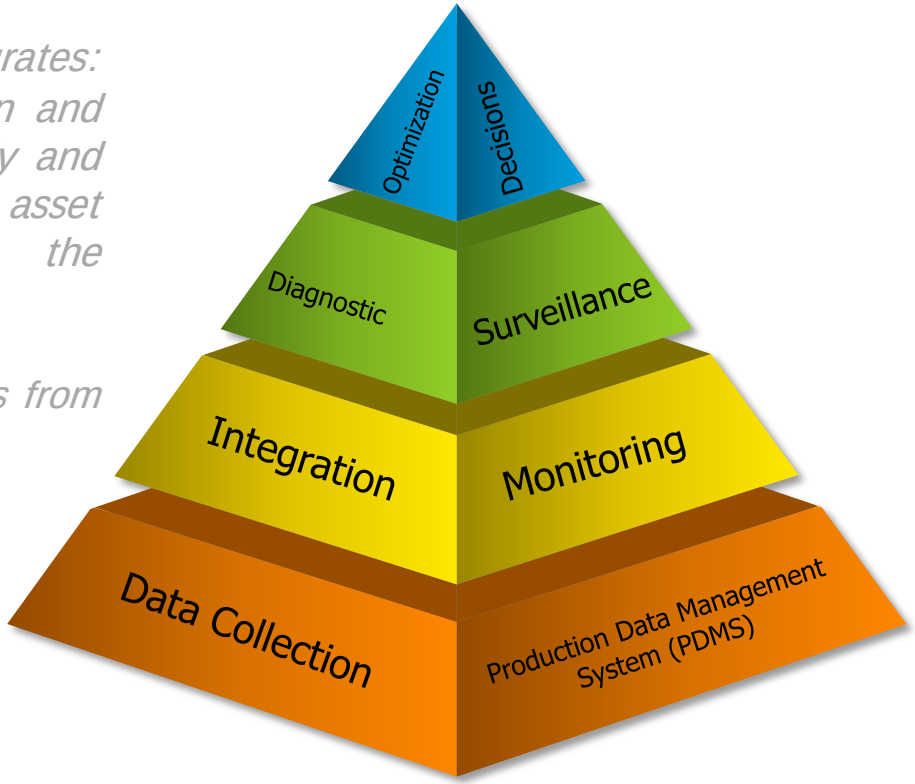
Well	Scenario Name	THP (psia)	Liquid Rate (bbl/d)	Oil Rate (bbl/d)	Water Rate (bbl/d)	Gas Rate (Mcf/d)	Water Cut (%)	GOR (1000ft3/bbl)	FBHP (psia)	PI ((bbls/d)/psi)
ESP-01	v1	186.95	2696.81	296.65	2400.16	8.9	89	0.03	1643.04	6.88
ESP-02	v1	230.16	5548.56	1553.6	3994.96	46.61	72	0.03	1477.27	8.98
ESP-03	v1	204.59	3582.07	322.39	3259.68	9.67	91	0.03	1529.15	6.33
GL-01	v1	134.52	3268.72	3268.72	0	454.03	0	0.1389	482.35	101.02
NF-01	v1	989.44	1772.18	1536.66	235.52	21440.96	13.29	13.953	2275.7	0.99
NF-02	v1	970.61	2407.44	2396.37	11.07	5724.92	0.46	2.389	3369.22	2.86
NF-03	v1	971.35	4059.71	4059.71	0	4879.78	0	1.202	3807.23	8
PCP-01	v1	83.82	1661.83	1661.83	0	149.56	0	0.09	518.63	8.09



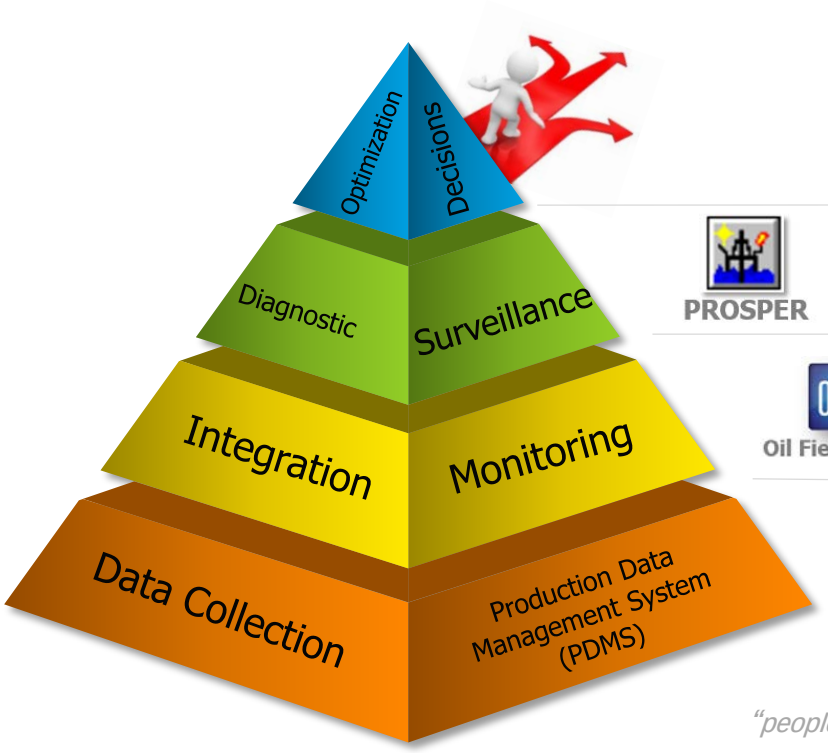
THE FOUNDATION FOR DIGITAL OIL FIELD

"The DOF is the solution that integrates: technology, people, process & organization and information, using online data to efficiently and effectively maximize oil and gas asset performance and value throughout the production life cycle"

Source: David Rossi – DOF Maximizing values from online data – Feb 2016



THE FOUNDATION FOR DIGITAL OIL FIELD



SAP
MERAK
PROSPER
GAP
MBAL
RESOLVE
TIBCO Spotfire
Predictive Model
OFM
Oil Field Manager
SQL Server Reporting Services
TIBCO Spotfire
Monitoring
SQL Server
Visualization Server
AVOCET
SQL Server
CITRIX

"people, process & organization, information, technology"

AGENDA

- ❑ BACKGROUND
  - CEPSA IN THE WORLD
  - IT INFRAESTRUCTURE
- ❑ OBJECTIVES
- ❑ DEPLOYMENT
  - DATA CAPTURING-PROCESSING WORKFLOW
- ❑ TOWARDS PRODUCTION OPTIMIZATION
- ❑ CONCLUSIONS
- ❑ QUESTIONS

CONCLUSIONS

- Successfully deployed within budget and schedule.
- Objectives achieved in terms of: centralized storage and repository, QA/QC, reporting centralization and visualization at all levels, integration with software beyond Schlumberger products, automation of analysis and surveillance, improved response for changing well – facilities behaviors/conditions.
- Cepsa gained in security, consistency and integrity of the data besides cost reduction within a robust system architecture.
- The benefits are across all E&P units: Production, Reservoir, G&G, finance and top management, based on data reliable and available.
- Centralization on data monitoring allow quick identification of field issue such as, subsurface and surface production constraints and bottlenecks.

THANKS FOR YOUR ATTENTION!

QUESTIONS?

CEPSA