First integrated PIPESIM + Symmetry + MySep application in Kazakhstan enables digital optimization of the production and process systems

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ҚазГерМұнай
ЖАУАПКЕРШІЛІГІ ШЕКТЕУЛІ СЕРІКТЕСТІГІ
БІРІККЕН КӘСІПОРНЫ

Agenda

1 Problem Definition

2 Methodology

3 Results

4 Conclusion

5 Benefits Analysis

6 Q&A

About KazGerMunay

Founded in 1988
Largest oil producer in the region

The “Digital Oilfield Project” developed in cooperation with Schlumberger in 2019

730+ Total staff

53% ORI

6 Oil and gas fields

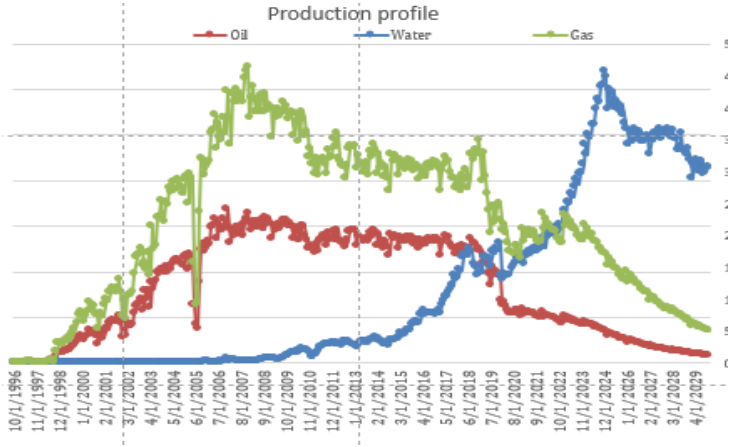
3 Mln tons Peak oil production

Problem Definition

To identify potential bottlenecks associated with increased produced water in Year 2025

To propose the retrofit options for the oil/water separators to improve performance

To calculate the capacity of the separators at maximum water cut



Jan-Apr 2020
Model all three facilities in Symmetry based on plant data

May-June 2020
Identify bottlenecks & propose solutions

Aug-Sep 2020
Integrate PIPESIM & Symmetry

Sep-Oct 2021
Integrate MySep & Symmetry

May-June 2022
Finalise Separator Upgrades

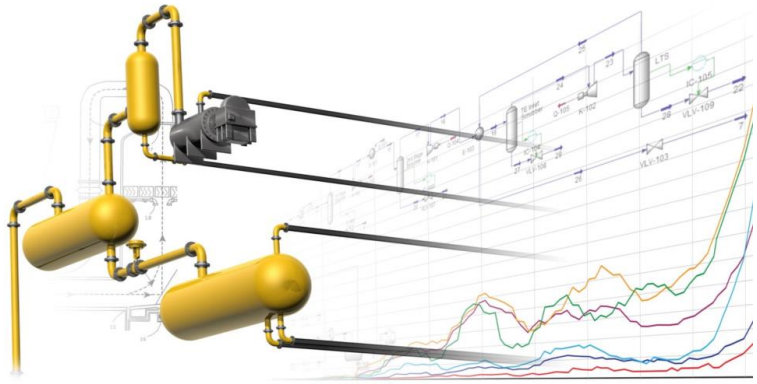
Methodology

Fluids Data

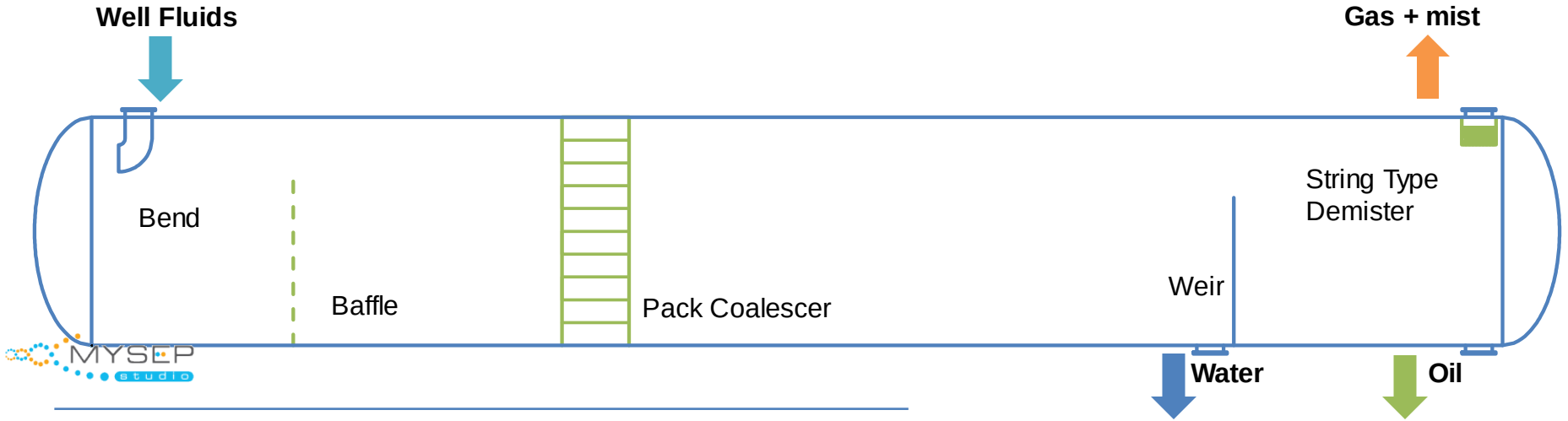
Symmetry Fluids Engine + PVT ToolBox

Separation Management

- Create the most advanced fluid characterization technology for the hydrocarbon industry from reservoir to facilities
- Unify fluids simulation technology within Schlumberger



Results – MYSEP & Symmetry Integration



Performance Measures	Base Case
Pressure drop across the vessel (mbar)	38
Oil in water removal d100 (micron)	104
Oil in water carryunder (liter/hr)	1230
Oil in water concentration (% v/v)	0.74

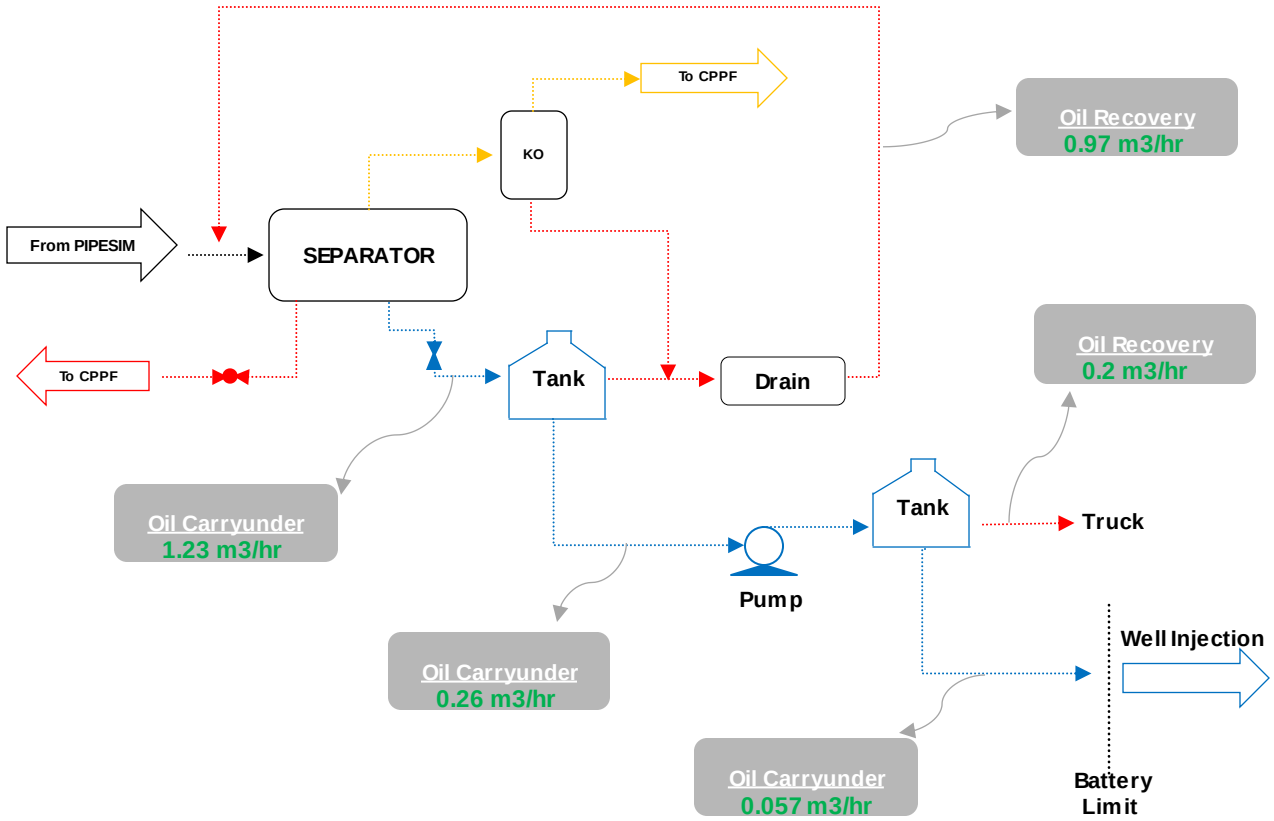
Results

As built

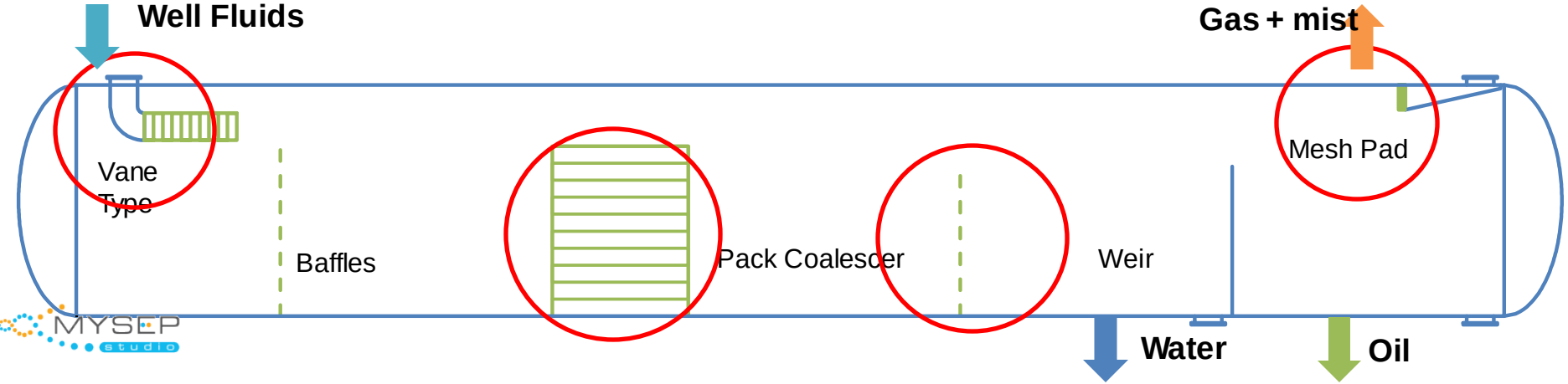
1369 liters/day
Oil in water

≈$845
Loss/day

≈$0.270MM
Annual loss



Results – MYSEP & Symmetry Integration

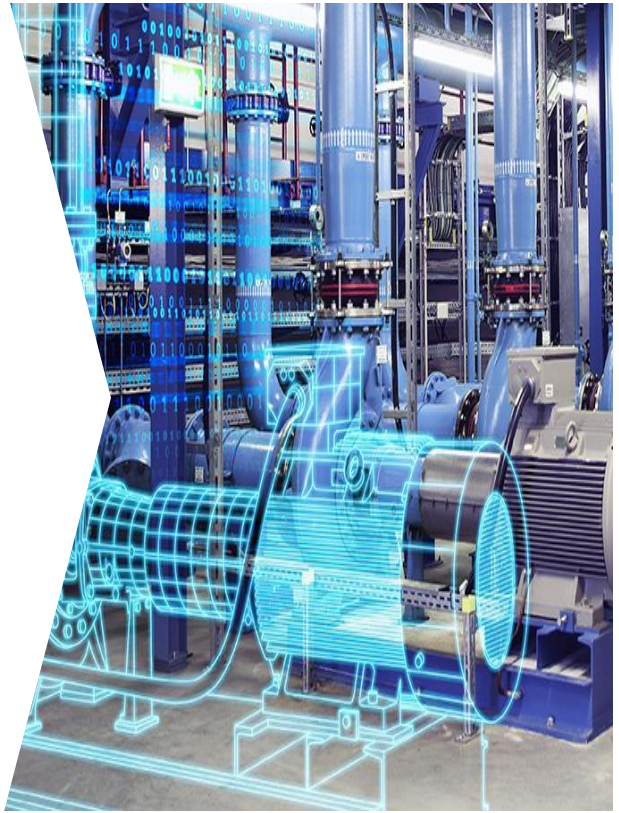


As built	Retrofit
Bend	Vane Type
#baffle-1	#baffle-2
Pack length- 750 mm	Pack length- 2000 mm
String Type	Mesh Pad

Performance Measures	Base Case	Optimized Case 2022
Pressure drop (mbar)	38	14
Oil in water removal d100 (micron)	104	42
Oil in water carryunder (liter/hr)	1230	120
Oil in water concentration (% v/v)	0.74	0.07

Conclusions from the Project

- The MySep model is able to accurately represent the present-day operation of the separator
- The proposed modifications are expected to allow for management of increased produced water
- Integrated modeling maintains asset integrity
- Integrated modeling is essential to avoid un-planned shut-down
- The MySep model can be modified by the Client to utilise the model serve as a predictive tool for future scenarios
- The proposed modifications extend field life and enable Client to achieve their production objectives
- Integrated modeling helps to optimize operations to meet business targets



Benefits Analysis

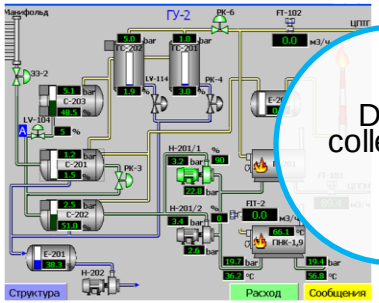
КазГерМунай
ТОВАРИЩЕСТВО С ОГРАНИЧЕННОЙ ОТВЕТСТВЕННОСТЬЮ
СОВМЕСТНОЕ ПРЕДПРИЯТИЕ

Retrofitting the separator

- 3 months Payback period
- $250,000 saved during the first year
- Eliminating the need in additional tank
- Better decision making on future investments
- Integrated view of the facility
- Achieving production objectives
- Improved oil recovery = more profit $

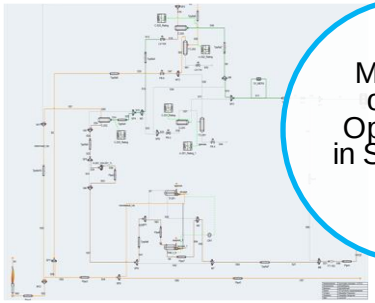
Full management and execution of technical work and associated deliverables

Attended site visit and collected DCS data



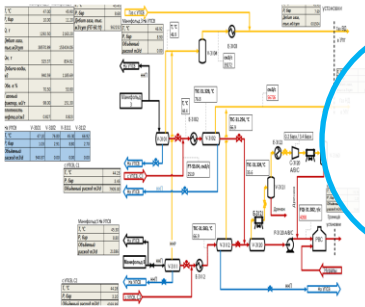
Data collection

Modelling



Modelling of Plant Operations in Symmetry

Integration

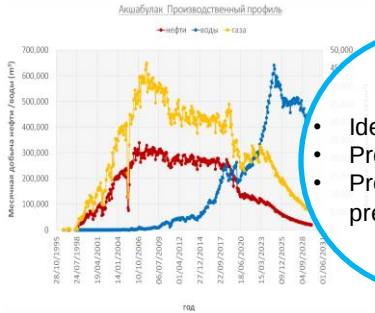


Integration of PIPESIM, and Symmetry and MySep

Site Interfacing

Daily discussions with field operators

Analysis



- Identify Bottlenecks
- Propose Solutions
- Prepare technical presentation

Project Deliverables

- Final report
- Presentation

Q&A Session